Alexander E. Hoffnung, Ph.D.

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Education

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

City University of New York, Brooklyn College, NYC, US
B. Sci. in Mathematics, Computer Information Science, 2005
Summa cum laude

Universidad Católica de Santiago de Guayaquil, Guayaquil, EC
Spanish, 2004

The New School, Eugene Lang College, NYC, US
Writing, Sociology of Race, Class and Gender, 1999

Programming Experience

Strong background in fundamentals of computation and algorithms

Broad knowledge of category theory and higher category theory — categories are well-known to model functional programming languages (e.g., Haskell)

Familiar with principles of MVC (Model, View, Controller) design and version control software (e.g., GitHub)

Designing iOS puzzle game in Swift with SpriteKit including all graphics in Adobe Photoshop and Illustrator

Designed and created database with machine learning capabilities to benchmark relevance-sensitive belief revision processes in artificial intelligence

Maintained teacher evaluation web application including development of front and back ends in PHP, JavaScript, MySQL, and HTML/CSS

Research Experience

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

Guest Researcher, 2011
Max-Planck-Institut für Mathematik, Bonn, DE
Representation Theory Group

Centre de Recherche en Mathématiques Postdoctoral Fellow, 2010 – 2012
University of Ottawa, Ottawa, CA
Algebra Group, Category Theory & Logic Group

Teaching Experience

Temple University, Philadelphia, US, 2012 – 2014
· Taught undergraduate calculus courses
· Designed and taught Ph.D. level course in category theory

University of Ottawa, Ottawa, CA, 2010 – 2012
· Taught courses in Euclidean and spherical geometry and discrete math in computer science

University of California at Riverside, Riverside, US, 2005 – 2009
· Led discussion sessions in topology, history of mathematics, and complex analysis

Work Experience

Academic Coordinator, Office of the Dean of Undergraduate Studies, 2003 – 2005
City University of New York, Brooklyn College, Brooklyn, US
· Developed program to identify and track students to provide academic support and advisement

Historical Tour Guide, 2001– 2002
Central Park Bicycle Tours, Central Park, New York, US

Field Team Leader, 2000
United States Census Bureau, New Haven, US

Department Head, Promotional Merchandise, 1998 – 2000
Rawkus Records, LLC, New York, US
· Supervised small team
· Processed internet sales of vinyl records and merchandise
· Prepared artist promotional packages for international tours

Grants Awarded

FQXi Foundational Questions Institute Grant w. J. Baez, 2009
· Categorifying Fundamental Physics

National Science Foundation Grant, w. J. Baez, 2007
· Quantum Computation

University of California, Riverside, 2005 – 2010
· Dissertation Year Fellowship
· Graduate Dean's Dissertation Research Grant
· Chancellor's Fellowship

City University of New York, Brooklyn College, 2001 – 2005
· Brooklyn College Foundation Presidential Scholarship
· Class of 2005: Brooklyn College's Seven Outstanding Students
· James Isadore Singer Mathematics Award
· Milton Abramowitz Mathematics Award
· Harry Rosenfeld-Berle and Ida Fischer Reade Mathematics Prize
· Olga Kattan Language Award

Publications

Advances in Mathematics, 2015. What do homotopy algebras form?
Joint with V. Dolgushev and C. Rogers. Available online as arXiv.org:1406.1751.

Theory and Applications of Categories, (to appear). Spans in 2-Categories: A Monoidal Tricategory.
Available online as arXiv.org:1112.0560.

Selecta Mathematica, 2013. Formal Hecke algebras and algebraic oriented cohomology theories.
Joint with J. Malagón-Lópen, A. Savage, and K. Zainoulline. Available online as arXiv.org:1208.4114.

Axioms, 2012. The Hecke Bicategory.
Available online as arXiv.org:1007.1931.

Transactions of the American Mathematical Society, 2011. Convenient Categories of Smooth Spaces.
Joint with J. Baez. Available online as arXiv.org:0807.1704.

Journal of Algebraic Combinatorics, 2010. Nilpotency in type A cyclotomic quotients.
Joint with A. Lauda. Available online as arXiv.org:0903.2992.

Theory and Applications of Categories, 2010. Higher Dimensional Algebra 7.
Joint with J. Baez and C. Walker. Available online as arXiv.org:0812.4864.

Comm. in Math. Physics, 2010. Categorified Symplectic Geometry and the Classical String.
Joint with J. Baez and C. Rogers. Available online as arXiv.org:0808.0246.

Referee Work and Editing

· *Communications in Mathematical Physics*
· *Journal of Mathematical Physics*
· *Journal of the London Mathematical Society*
· *Journal of Algebra*
· *Differential Geometry and its Applications*
· *Journal of Homotopy and Related Structures*
· *Theory and Applications of Categories*
· *Quantum Computing for Computer Scientists*
· *American Mathematical Society Math Reviews*

Meetings Organized

Categorification and Topological Invariants – Petit Groupe de Travail
Centre International des Rencontres Mathematiques (CIRM), Luminy, FR
· Co-authored grant proposal to organize a small working group of international mathematicians
· Lectured on enriched category theory and its applications

Workshop on Category Theoretic Methods in Representation Theory
The Fields Institute for Research in Mathematical Sciences, Ottawa, CA
· Co-authored budget and grant proposal
· Conceived of and implemented program of international speakers

Young Researchers Workshop on Higher Algebraic and Geometric Structures
The Fields Institute for Research in Mathematical Sciences, Toronto, CA
· Co-authored budget and grant proposal
· Identified key players in emerging field
· Gathered international young mathematicians for networking and academic research opportunities