Curriculum Vitæ

Ben ELIAS

CAREER AND HISTORY

Current position

– **Massachusetts Institute of Technology, Cambridge MA.** NSF Postdoctoral Research Fellow and Lecturer. September 2011 to August 2014.

Education

– **PhD in Mathematics** – Columbia University (2006-2011).
Thesis Title : Soergel bimodules for dihedral groups.
Supervisor : Mikhail Khovanov

– **PhD candidate in Mathematics** – Brandeis University (2005-2006).

– **BA in Mathematics** – Princeton University (2001-2005).
Thesis Title : Minimally faithful group actions and p-groups.
Supervisor : Ramin Takloo-Bighash
Honors : Summa cum laude

Personal History

– **Date of Birth :** 12/27/1983.

– **Nationality :** US Citizen.

TEACHING EXPERIENCE

– **Recitation Instructor** – MIT. Multivariable calculus, 25 students, (Fall 2013).

– **Instructor** – MIT. Advanced undergraduate seminar on Coxeter groups, 4 students, (Fall 2013).

– **Recitation Instructor and Course Administrator** – MIT. Ordinary differential equations, 25 students in recitation, 200 students in class, (Fall 2012).

– **Teaching Assistant** – Columbia University. Modern Algebra I, (Spring 2011).

– **Teaching Assistant** – Columbia University. Calculus IV, (Fall 2010).

– **Instructor** – Columbia University. Undergraduate seminar on Coxeter groups, 10 students, (Spring 2010).

– **Research Assistant** – Columbia University. Mentored students and lectured at an REU on categorifications of quantum groups, 3 students (Summer 2008).

– **Teaching assistant** – Columbia University. Year-long graduate course on representation theory, (Fall 2008 – Spring 2009).

– **Teaching assistant** – Columbia University. Year-long graduate course on representation theory, (Fall 2007 – Spring 2008).

– **Instructor** – Columbia University. Ordinary Differential Equations, 14 students (Summer 2007).

INVITED LECTURES

Conferences

- **Mapping Class groups and Categorification** – Banff, Canada. *An introduction to Soergel bimodules and Rouquier complexes*, (April 2013).
- **Geometric Methods in Infinite-dimensional Lie Theory** – Fields Institute, Toronto, Canada. *Soergel's conjecture : a proof and a counterexample*, (March 2013).
- **Geometric, Categorical and Combinatorial Methods in Representation Theory** – Rochester, NY. *A quantum Satake equivalence for* $\mathfrak{sl}_2$, (September 2012).
- **Modern Methods in Representation Theory** – Fields Institute, Toronto, Canada. *Categorical actions of Coxeter groups and Hecke algebras*, (May 2012).
- **Category Theoretic Methods in Representation Theory** – Ottawa, Canada. *Soergel bimodules and Kazhdan-Lusztig theory I*, (October 2011).
- **Categorification on Broadway** – Columbia University, NY. *Categorifications of tensor products*, (December 2010).
- **XIX Oporto Meeting on Geometry, Topology and Physics** – Faro, Portugal. *A diagrammatic categorification of the Hecke algebra,* (July 2010).

Colloquia

- **Colloquium** – University of North Carolina, Chapel Hill. *The new homological algebra :* p*-complexes and categorification at roots of unity*, (September 2013).
- **Colloquium** – University of Oregon, Eugene. *Diagrammatic categorification*, (October 2010).

Lecture Series

- **Masterclass** – Universidad de Chile, Santiago. *Soergel's conjecture : a proof and a counterexample*, 3 talks, (May 2013).
- **Masterclass, joint with Geordie Williamson** – QGM, Aarhus, Denmark. *Soergel bimodules and Kazhdan-Lusztig conjectures*, 20 talks, (March 2013).
- **Seminar on Categorification** – MIT. *Lectures on* $\mathfrak{sl}_2$ *categorification,* 6 talks, (Fall 2011).
- **Special Lectures** – University of Nagoya, Japan. *Hecke algebras, Soergel bimodules, and Kazhdan-Lusztig theory*, 3 talks, (July 2011).
- **Special Lectures** – University of Zurich, Switzerland. *Lecture series on Webster's Categorification of Tensor Products*, 6 talks, (June 2010).

Selected Seminars

- **Algebra Seminar** – Northeastern University. *Categorification at a root of unity*, (February 2013).
- **Topology Seminar** – Boston College. *An introduction to Rouquier complexes and the Soergel conjecture*, (February 2013).
- **Lie Groups Seminar** – MIT. *The Hodge Theory of Soergel Bimodules*, (November 2012).
- **Special Talk** – Northeastern University. *Some aspects of Manin-Schechtmann theory*, (October 2012).
- **Algebra Seminar** – Northeastern University. *Geometric Satake : algebraized and quantized*, (October 2012).
- **Everytopic Seminar** – Brandeis University. *Geometric Satake for Dummies (and quantum dummies)*, (October 2012).
- **Algebra Seminar** – University of Bonn, Germany. *Soergel bimodules for the dihedral group and Temperley-Lieb algebras at roots of unity*, (November 2011).
- **Hecke Study Seminar** – MPI Bonn, Germany. *Soergel categorification of the Hecke algebra*, (November 2011).
- **Topology Seminar** – UCLA. *Generators and Relations for Soergel Bimodules, and Applications to/from Topology*, (October 2011).
- **Algebra Seminar** – University of Oregon, Eugene. *Manin-Schechtman theory and Soergel bimodules*, (October 2010).
- **Symplectic Geometry, Gauge Theory, and Categorification Seminar** – Columbia University. *A diagrammatic categorification of the Hecke algebra*, (September 2010).
- **Special Talk** – Oxford University, UK. *A diagrammatic categorification of the Hecke algebra*, (November 2009).

PROFESSIONAL ACTIVITIES

- **Master class : Soergel bimodules and Kazhdan-Lusztig conjectures** – Aarhus, Denmark. Twenty hour master class with Geordie Williamson (18 – 22 March 2013).
- **PRIMES-USA Program Coordinator** – MIT. A year-long program for select high school students across the US to do publishable research with MIT graduate students. (Fall 2012 – Summer 2013).
- **Departmental Graduate Student Representative** – Columbia University. (Fall 2007 – Spring 2009)
- **Referee for** – International Journal of Mathematics and Mathematical Sciences, Journal of Knot Theory and its Ramifications, Quantum Topology, London Mathematical Society, Compositio Mathematica, Journal of Representation Theory, Memoirs of the AMS.
- **Grant review for** – National Security Agency.

RESEARCH VISITS

- **Universidad de Chile,** 25 April – 13 May, 2013.
- **Max Planck Institute Bonn,** 7 November – 28 November, 2011.
- **Nagoya University,** 18 July – 25 July, 2011.
- **Oxford University,** 24 October – 8 November, 2010.