

BRENT NELSON

CURRICULUM VITAE

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UC Berkeley Department of Mathematics
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EMPLOYMENT

NSF Postdoctoral Fellow, University of California, Berkeley July 2015 – Present
with Dan-Virgil Voiculescu

VISITING SCHOLAR POSITIONS

Hausdorff Research Institute for Mathematics, Bonn Germany May 2016 – August 2016
Trimester program on von Neumann algebras

EDUCATION

PhD University of California, Los Angeles August 2010 – June 2015
Mathematics
Advisor: Dimitri Shlyakhtenko

BS University of Illinois at Urbana-Champaign August 2007 – May 2010
Graduated Summa Cum Laude in Mathematics
Graduate Preparatory Program, Minor in Physics

RESEARCH INTERESTS

Functional analysis, operator algebras, free probability, von Neumann algebras, planar algebras

PUBLICATIONS

1. *Free monotone transport without a trace*, Comm. Math. Phys. **334** (2015), no. 3, 1245–1298.
2. *Free transport for finite depth subfactor planar algebras*, J. Funct. Anal. **268** (2015), no. 9, 2586–2620.
3. *Combinatorics of bi-freeness with amalgamation* with I. Charlesworth and P. Skoufranis, Comm. Math. Phys. **338** (2015), no. 2, 801–847.
4. *On two-faced families of non-commutative random variables* with I. Charlesworth and P. Skoufranis, Canad. J. Math. **67** (2016), no. 6, 1290–1325.

5. *An application of free transport to mixed q-Gaussian algebras* with Q. Zeng, Proc. Amer. Math. Soc., **144** (2016), no. 10, 4357-4366.
6. *Free monotone transport for infinite variables* with Q. Zeng, Int. Math. Res. Not. IMRN, preprint available at doi:10.1093/imrn/rnx060 (2017).
7. *On finite free Fisher information for eigenvectors of a modular operator*, J. Funct. Anal., preprint available at doi:10.1016/j.jfa.2017.06.014 (2017).
8. *Free Stein kernels and an improvement of the free logarithmic Sobolev inequality* with M. Fathi, Adv. Math., **317** (2017), no. 7, 193-223.
9. *Free transport for interpolated free group factors* with M. Hartglass, J. Funct. Anal., preprint available at doi:10.1016/j.jfa.2017.08.002 (2017).

HONORS AND AWARDS

Pacific Journal of Mathematics Dissertation Prize Pacific Journal of Mathematics	June 2015
Mathematical Sciences Postdoctoral Research Fellowship National Science Foundation	April 2015
Dissertation Year Fellowship University of California, Los Angeles	May 2014
NSF Research and Training Grant Fellowship University of California, Los Angeles, Mathematics Department	August 2010
H. Roy Brahana Prize University of Illinois at Urbana-Champaign, Mathematics Department	May 2010
Emily Mann Peck Scholarship University of Illinois at Urbana-Champaign, Mathematics Department	May 2009
Elizabeth R. Bennett Scholarship in Mathematics University of Illinois at Urbana-Champaign, Mathematics Department	May 2008
Robert W. Rogers Scholarship University of Illinois at Urbana-Champaign	August 2007
Robert C. Byrd Scholar University of Illinois at Urbana-Champaign	August 2007

TEACHING EXPERIENCE

University of California, Berkeley

- *Course Instructor:*
 - Math 104 – *Introduction to Analysis* (Fall 2017)
 - Math 209 – *Von Neumann Algebras* (Spring 2017)
 - Math H104 – *Honors Introduction to Analysis* (Fall 2016)

University of California, Los Angeles

- *Course Instructor:*
 - Math 32B - *Calculus of Several Variables II* (Spring 2014)
- *Teaching Assistant:*
 - Math 3B – *Calculus for Life Science Students* (Summer 2014)
 - Math 31A – *Differential and Integral Calculus* (Summer 2012)
 - Math 131A – *Analysis* (Spring 2012)
 - Math 32A – *Calculus of Several Variables I* (Spring 2012)
 - Math 31B – *Integration and Infinite Series* (Winter 2012)
 - Math 32B – *Calculus of Several Variables II* (Winter 2012)
 - Math 31A – *Differential and Integral Calculus* (Fall 2011)
 - Math 32B – *Calculus of Several Variables II* (Fall 2011)

PRESENTATIONS

Invited Presentations

- AMS Fall Western Sectional Meeting, Special Session on Advances in Operator Algebras, University of California, Riverside (November 2017)
- Operator Theory Seminar, University of Iowa (October 2017)
- Wabash Miniconference, Indiana University–Purdue University Indianapolis (September 2017)
- Departmental Colloquium, Indiana University (September 2017)
- Mathematical Congress of the Americas, Montreal (July 2017)
 - Scientific Session on Free Probability and its Applications
 - Scientific Session on Von Neumann Algebras and their Applications
- Statistics and Probability Seminar, Boston University (April 2017)
- Noncommutative Geometry Seminar, The Ohio State University (March 2017)
- Joint Mathematics Meetings, AMS Special Session on Advances in Operator Algebras, Atlanta (January 2017)
- Analytic versus Combinatorial in Free Probability, Banff International Research Station (December 2016)
- Functional Analysis Seminar, UCLA (November 2016)
- Subfactor Seminar, Vanderbilt University (October 2016)
- C*-Algebras Workshop, Mathematisches Forschungsinstitut Oberwolfach (August 2016)
- Oberseminar zur Freien Wahrscheinlichkeit, Universität des Saarlandes (June 2016)

- NCGOA Spring Institute, Hausdorff Research Institute for Mathematics in Bonn, Germany (May 2016)
- Probabilistic Operator Algebra Seminar, UC Berkeley (February 2016)
- Joint Mathematics Meetings, AMS Special Session on Classification Problems in Operator Algebras, Seattle (January 2016)
- Operator Algebras Seminar, Purdue University (November 2015)
- West Coast Operator Algebras Seminar, UC San Diego (October 2015)
- AMS Central Fall Sectional Meeting, Special Session on Recent Advances in Non-Commutative Analysis, Loyola University Chicago (October 2015)
- Free Probability Theory Workshop, Mathematisches Forschungsinstitut Oberwolfach (June 2015)
- Extended Probabilistic Operator Algebras Seminar, UC Berkeley (May 2015)
- Free (Stochastic) Analysis, Saarland University (March 2015)
- Joint Mathematics Meetings, AMS Special Session on Classification Problems in Operator Algebras, San Antonio (January 2015)
- Free Probability Seminar, Texas A&M University (November 2014)
- West Coast Operator Algebras Seminar, University of Denver (November 2014)
- Subfactor Seminar, Vanderbilt University (October 2014)
- Workshop on von Neumann Algebras and Ergodic Theory, UCLA (September 2014)
- AMS Central Fall Sectional Meeting, Special Session on von Neumann Algebras and Related Fields, University of Wisconsin-Eau Claire (September 2014)
- Summer Informal Regional Functional Analysis Seminar – Free Probability Concentration Week, Texas A&M University (July 2014)
- Free Probability and the Large N Limit IV, UC Berkeley (March 2014)
- AMS Southeastern Spring Sectional Meeting, Special Session on von Neumann Algebras and Free Probability, University of Tennessee, Knoxville (March 2014)
- Probabilistic Operator Algebra Seminar, UC Berkeley (February 2014)
- Functional Analysis Seminar, UCLA (October 2013)

Contributed Presentations

- Dyson–Schwinger Equations, Topological Expansions, and Random Matrices, University of Columbia (August 2017)
- Great Plains Operator Theory Symposium, Texas Christian University (May 2017)
- Cal Day, UC Berkeley (April 2017)
- Free Probability and the Large N Limit V, UC Berkeley (March 2016)
- Great Plains Operator Theory Symposium, Kansas State University (May 2014)
- Functional Analysis Seminar, UCLA (February 2014)
- Optimal Transport and Applications Summer School, UCLA Conference Center, Lake Arrowhead, California (October 2013)

Other Conferences Attended

- Random Matrices, Park City Mathematics Institute (June 2017)
- Ergodic Theory and Operator Algebras, Texas A&M University (June 2017)
- NCGOA Spring Institute, Vanderbilt University (May 2017)

- East Coast Operator Algebras Seminar, Loyola University Chicago (October 2016)
- NCGOA Spring Institute, Vanderbilt University (May 2015)
- Kadison-Singer, Interlacing Polynomials, and Beyond, MSRI (March 2015)
- Subfactor Theory in Mathematics and Physics, Maui, Hawaii (July 2014)
- Subfactors and Fusion Categories, Banff International Research Station (April 2014)
- Great Plains Operator Theory Symposium, UC Berkeley (May 2013)
- Workshop on von Neumann Algebras and Ergodic Theory, UCLA (May 2012)

PROFESSIONAL ACTIVITIES

Refereeing Services

- Advances in Mathematics
- AMS Mathematical Reviews
- Communications in Mathematical Physics
- Houston Journal of Mathematics
- International Mathematical Research Notices
- Journal of Functional Analysis
- Journal of the London Mathematical Society
- Proceedings of the AMS

Conferences Organized

- Extended Probabilistic Operator Algebras Seminar, UC Berkeley (November 2017)
- Free Probability and the Large N Limit V, UC Berkeley (March 2016)