
Kyle Hambrook

EDUCATION

- Ph.D. Mathematics, University of British Columbia (2015)
Thesis: Restriction Theorems and Salem Sets. Supervisor: Izabella Łaba
- M.Sc. Mathematics, University of British Columbia (2011)
Thesis: Implementation of a Thue-Mahler Equation Solver. Supervisor: Michael Bennett
- B.Sc. Physics and Mathematics (*With Great Distinction*), University of Lethbridge (2009)

EMPLOYMENT

- NSERC Fellow and Visiting Assistant Professor, University of Rochester (2015-present)

ARTICLES PUBLISHED OR ACCEPTED

- **K. Hambrook**, *Explicit Salem sets and applications to metrical Diophantine approximation*, Trans. Amer. Math. Soc., accepted with minor revision.
- **K. Hambrook**, *Explicit Salem Sets in \mathbb{R}^2* , Advances in Mathematics 311 (2017), 634-648.
- **K. Hambrook**, I. Łaba, *Sharpness of the Mockenhaupt-Mitsis-Bak-Seeger restriction theorem in higher dimensions*, Bulletin of the London Mathematical Society 48 (2016), 757-770.
- A. Akbary, **K. Hambrook**, *A variant of the Bombieri-Vinogradov theorem with explicit constants and applications*, Mathematics of Computation 84 (2015), 1901-1932
- **K. Hambrook**, I. Łaba, *On the sharpness of Mockenhaupt's restriction theorem*, Geometric and Functional Analysis 23 (2013), no. 4, 1262-1277.
- **K. Hambrook**, S. L. Wismath, *Minimal characteristic algebras for rectangular k -normal identities*, Algebra Colloquium 18 (2011), no. 4, 611-628.
- A. Predoi-Cross, **K. Hambrook**, R. Keller, D. Hurtmans, C. Povey, H. Over, G. Mellau, *Spectroscopic lineshape study of the self-perturbed oxygen A-Band*, Journal of Molecular Spectroscopy 248 (2008), 85-110.
- A. Predoi-Cross, **K. Hambrook**, S. Brawley-Tremblay, J.-P. Bouanich, V.M. Devi, M.A.H. Smith, *Room-temperature broadening and pressure-shift coefficients in the 2 band of CH₃D-O₂: measurements and semi-classical calculations*, Journal of Molecular Spectroscopy 236 (2006), 75-90.
- A. Predoi-Cross, **K. Hambrook**, M. Brawley-Tremblay, J.-P. Bouanich, M.A.H. Smith, *Measurements and theoretical calculations of N₂-broadening and N₂-shift coefficients in the 2 band of CH₃D*, Journal of Molecular Spectroscopy 235 (2006), 35-53.
- A. Predoi-Cross, **K. Hambrook**, M. Brawley-Tremblay, J.-P. Bouanich, V.M. Devi, D.C. Benner, L.R. Brown, *Measurements and theoretical calculations of self-broadening and self-shift coefficients in the 2 band of CH₃D*, Journal of Molecular Spectroscopy 234 (2005), 53-74.

ARTICLES SUBMITTED

- R. Fraser, **K. Hambrook**, *Explicit Salem sets, Fourier restriction, and metric Diophantine approximation in the p -adic numbers*, submitted to Proceedings of the Royal Society of Edinburgh, Section A: Mathematics.
- **K. Hambrook**, A. Iosevich, A. Rice, *Group actions and a multi-parameter Falconer distance problem*, submitted to Bulletin of the London Mathematical Society.

ARTICLES IN PREPARATION

- **K. Hambrook**, H. Yu, *Fourier decay and restriction for fractal measure on curves*.
- **K. Hambrook**, *An optimal multi-fractal Fourier restriction theorem*.
- **K. Hambrook**, K. Taylor, *Dimension and measure of fractal packings*.
- **K. Hambrook**, B. Murphy, *Sharpness of L^2 restriction theorems in intermediate dimensions*.
- **K. Hambrook**, *The logical equivalence of l'Hospital's rule and the least upper bound property*.

RESEARCH STUDENTS SUPERVISED

- David Soukup, Undergraduate Student, University of Rochester, Oct 2017 - Present, Project: Mass Transference for Simultaneous Linear Forms in Local Fields and Generalizations.
- Shashank Chorge, Graduate Student, University of Rochester, Oct 2017 - Present, Project: Existence of Salem Sets in Vector Spaces over Local Fields.
- Anirudh Gurjale, Graduate, University of Rochester, Oct 2017 - Present, Project: Schmidt and Sprindžuk's Theorems in Local Fields.
- Huijun Yu, Undergraduate Student, University of Rochester, Oct 2016 - Apr 2017, Project: Fourier Decay and Restriction for Fractal Measures on Curves.

TEACHING: COURSES TAUGHT

- Average Evaluation Score: Institutional - **4.0/5**, RateMyProfessors.com - **4.6/5**
- Department of Mathematics, University of Rochester
 - Fall 2017: MTH 161 Calculus IA (Head Instructor and Workshop Coordinator); MTH 210 Introduction to Financial Mathematics; MTH 391W Portfolio Management (Independent Study)
 - Fall 2016: MTH 142 Calculus II; MTH 210 Introduction to Financial Mathematics
 - Fall 2015: MTH 161 Calculus IA; MTH 201 Introduction to Probability
- Department of Mathematics, University of British Columbia
 - Spring 2015: MATH 152 Linear Systems
 - Fall 2014: MATH 104 Differential Calculus with Applications to Commerce and Social Sciences
 - Spring 2013: MATH 105 Integral Calculus with Applications to Commerce and Social Sciences
 - Spring 2011: MATH 101 Integral Calculus with Applications to Physical Sciences and Engineering

TEACHING: OTHER ACTIVITIES

- Workshop Coordinator for MTH 161 Calculus IA, UR (Sep - Dec 2017)
Description: Design workshops; run weekly training and coordination meetings with TAs.
- Course Development for MTH 210 Introduction to Financial Mathematics, UR (Sep - Dec 2016)
Description: Complete redesign at request of UR Simon Business School. LaTeX-ed lecture notes, homeworks, textbook to be basis of course in future.
- Head TA of Math Learning Centre, UBC (Jan - Dec 2012)
Description: Managing the Math Learning Centre, which includes training, scheduling, and managing the approximately 50 teaching assistants who staff it each term.
- Teaching Assistant, Department of Mathematics, UBC (Sep 2009 - Aug 2015, Except When Teaching Courses Above)
Description: Activities include workshop facilitation, tutoring, marking, and exam invigilation.

SERVICE, PROFESSIONAL DEVELOPMENT, VOLUNTEERING

- Reviewer: Transactions of the American Mathematical Society, Proceedings of the American Mathematical Society, Canadian Journal of Mathematics, and Mathematics of Computation
- Organizer - (Submitted) AMS Special Session "Analysis and Geometry of Fractals" - Fall Western Sectional Meeting, San Francisco State University, San Francisco, CA, October 27-28, 2018
- Organizer - 11th PIMS Young Researchers Conference in Mathematics and Statistics, Jun 2 - 4, 2014
- Teaching Assistant Accreditation Program (Jan 2014 - Apr 2014)
- President of American Mathematical Society UBC Student Chapter (Oct 2013 - Oct 2014)
- President of UBC Math Graduate Committee (Oct 2011 - Oct 2013)
- Executive, UBC Teaching Assistants Union (CUPE 2278) (Sep 2012 - Dec 2012)
- Math Instructional Skills Workshop (Apr 24-27, 2012)
- Head Selection Committee Graduate Student Representative - UBC Department of Mathematics (2011)
- Student Representative - University of Lethbridge Department of Mathematics and Computer Science (2008-2009)
- Math Mania Program Volunteer - University of British Columbia (Summer 2010)
- University of Lethbridge Lego Robot and Scratch Programming Summer Camps (Summer 2007-2009)

AWARDS

- NSERC Postdoctoral Fellowship (2015) - \$90,000
- Statistical Society of Canada Case Study Competition - First Prize (2014) - \$500
- NSERC Canada Graduate Scholarship Doctoral Level (2011) - \$105,000
- Four Year Doctoral Fellowship - University of British Columbia (2011) - \$72,000
- Li Tze Fong Memorial Fellowship - University of British Columbia (2010) - \$25,000
- NSERC Canada Graduate Scholarship Masters Level (2009) - \$17,500
- Governor General's Academic Medal (2009)
- Chinook Undergraduate Research Award - University of Lethbridge (2008) - \$5,625
- NSERC-CMS Math in Moscow Scholarship (2008) - \$9,000
- NSERC Undergraduate Student Research Award (2006, 2007) - \$5,625
- Governor General's Academic Medal (2004)

PRESENTATIONS

- *Problems on Fourier Decay and Fourier Restriction for Fractal Measures* - Analysis Seminar, University of Rochester, Oct 20, 2017.
- *Fourier Analysis in Metric Diophantine Approximation* - Colloquium, University of Lethbridge, Oct 13, 2017.
- *Optimal Fourier Decay of Fractal Measures and Metric Diophantine Approximation* - Postdoctoral Seminar, University of Calgary, Oct 11, 2017.
- *Fourier Decay of Singular Measures, Salem Sets, and Metric Diophantine Approximation* - Analysis Seminar, Ohio State University, Sep 28, 2017.
- *Diophantine Approximation and Fourier Analysis on Fractals* - Colloquium, San Jose State University, Feb 3, 2017.
- *Sharpness of the Mockenhaupt-Mitsis-Bak-Seeger L^2 Restriction Theorem in Higher Dimensions* - Analysis Seminar, University of Rochester, Oct 16, 2015.
- *Explicit Salem Sets* - 2014 Canadian Mathematical Society Winter Meeting, McMaster University, Dec 5-8, 2014.
- *Well-Approximable Numbers* - 11th PIMS Young Researchers Conference in Mathematics and Statistics, University of British Columbia, Jun 2-4, 2014.
- *The Sharpness of Mockenhaupt's Restriction Theorem* - Harmonic Analysis Seminar, University of British Columbia, Mar 4, 2013.
- *Buffon's Needle Estimates for Rational Product Cantor Sets, after M. Bond, I. Laba, and A. Volberg* - Harmonic Analysis, Geometric Measure Theory, and Additive Combinatorics Summer School, Catalina Island, Jun 24-29, 2012.
- *Automatic Resolution of Thue-Mahler Equations: Examples and Applications* - Canadian Number Theory Association XII Meeting, University of Lethbridge, Jun 17-22, 2012.