

MICHAEL BRANNAN

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ACADEMIC APPOINTMENTS

University of Waterloo, Pure Mathematics	Associate Professor	2021 – present
University of Waterloo, Inst. for Quantum Computing	Associate Member	2021 – present
Texas A&M University, Mathematics	Associate Professor	2020 – 2021
Texas A&M University, Mathematics	Assistant Professor	2015 – 2020
University of Caen, France	Invited Visiting Professor	June 2016
University of Illinois, Mathematics	J.L. Doob Research Assistant Prof.	2012 – 2015
University of Illinois, Mathematics	NSERC Postdoctoral Fellow	2012 – 2014

PROFESSIONAL APPOINTMENTS

London Mathematical Society	Editor, Journal of the LMS	2023 – present
London Mathematical Society	Editor, Bulletin of the LMS	2023 – present

EDUCATION

Ph.D.	Queen's University, Mathematics	2008 – 2012
M.Math.	University of Waterloo, Pure Mathematics	2006 – 2008
B.Sc. Eng.	Queen's University, Mechanical Engineering and Mathematics	2002 – 2006

RESEARCH INTERESTS

Operator Algebras, Representation Theory, Quantum Algebra, Quantum Information Theory (QIT) and Mathematical Physics. I am particularly interested in studying interactions between these fields. Much of my current research uses mathematical tools inspired by from QIT to gain insight into various problems in pure mathematics, and conversely, the uses from representation theory, operator algebra, and quantum algebra to shed new light on theoretical problems arising in QIT.

RECENT GRANTS, FELLOWSHIPS, AWARDS

Research Grants

NSERC Discovery Grant: PI. (2022-2027, \$155,000).

NSF Grant - DMS-2000331: *Standard research grant - DMS Analysis Program.* PI. (2020-2023, \$243,828). Grant transferred to Eric Rowell, July 2021.

NSF Grant - DMS-1700267: *Standard research grant - DMS Analysis Program.* PI. (2017-2020, \$120,000)

T3 Grant: *Texas A&M Triads for Transformation Grant.* PI (with E. Rowell and A. Klappenecker (Co-PIs)). (2019-2021, \$32,800)

NSERC Postdoctoral Fellowship: Postdoctoral research fellowship from the government of Canada. (2012-2014, \$80,000 CAD)

Declined Awards/Nominations of Note

Canada Research Chair in Quantum Information (Tier II): Nominated by the University of Ottawa, March 2021. Nomination declined for faculty position at the University of Waterloo.

NSERC Banting Fellowship: International interdisciplinary research fellowship funded by the government of Canada. (2015-2017, \$140,000 CAD). Declined for tenure-track position at Texas A&M.

Conference Grants

Fields Institute Workshop Support: For May 2022 Summer School and Workshop on Topological Quantum Groups, Rigid C^* -Tensor Categories, and Subfactors. (\$5,000 CAD)

NSF Grant - DMS-2000335: *Conference Grant - YMC*A 2020*. PI (with Ian Charlesworth and Kari Eifler (co-PIs)). (2020-2022, \$31,454) PI transferred to Zhizhang Xie in July 2021.

NSF Grant - DMS-2000012: *Conference Grant - Brazos Analysis Seminar*. Co-Pi (with José Carrión, Mehrdad Kalantar, Tao Mei and David Milan). (2020-2023, \$49,999)

NSF Grant - DMS-1901633: *Conference Grant - Great Plains Operator Theory Symposium*. Co-PI. (2019-2020, \$50,000)

NSF Grant - DMS-1700320: *Conference Grant - Brazos Analysis Seminar*. Co-Pi (with Mehrdad Kalantar and Tao Mei (PI)). (2017-2019, \$45,000)

PUBLICATIONS and PREPRINTS

All preprints are available at <http://www.math.uwaterloo.ca/~m2branna/publications.html>

- (1) **M. Brannan**, S. Harris, I. Todorov, L. Turowska, *Quantum no-signalling bicorrelations*, 76 pages. Submitted (2023).
- (2) **M. Brannan**, F. Elzinga, S. Harris, and M. Yamashita, *Crossed product equivalence of quantum automorphism groups*, [International Mathematics Research Notices](#), No. 20 (2023), 17749–17787.
- (3) **M. Brannan**, M. Hamidi, L. Ismert, B. Nelson, and M. Wasilewski, *Quantum edge correspondences and quantum Cuntz-Krieger algebras*, [Journal of the London Mathematical Society](#), 107 (2023), no. 2, 886–913.
- (4) **M. Brannan**, S. Harris, I. Todorov, L. Turowska, *Synchronicity for quantum non-local games*, [Journal of Functional Analysis](#) 284 (2023), no. 2, Paper No. 109738.
- (5) **M. Brannan**, P. Ganesan, and S. Harris, *The quantum-to-classical graph homomorphism game*, [Journal of Mathematical Physics](#) 63 (2022), no. 11, Paper No. 112204, 34 pp.
- (6) **M. Brannan**, L. Gao, and M. Junge, *Complete Logarithmic Sobolev inequalities via Ricci curvature bounded below*, [Advances in Mathematics](#) 394 (2022), 108129.
- (7) **M. Brannan**, L. Gao, and M. Junge, *Complete Logarithmic Sobolev inequalities via Ricci curvature bounded below, II*, 51 pages. [Journal of Topology and Analysis](#), in press <https://doi.org/10.1142/S1793525321500461>.
- (8) **M. Brannan**, K. Eifler, C. Voigt, and M. Weber, *Quantum Cuntz-Krieger algebras*, [Transactions of the American Mathematical Society](#) 9 (2022), 782–826.
- (9) **M. Brannan**, A. Chirvasitu and A. Viselter, *Actions, quotients and lattices of locally compact quantum groups*. [Documenta Mathematica](#), 25 (2020), 2553-2582.
- (10) **M. Brannan**, *Book review: “Alice and Bob meet Banach—The interface of asymptotic geometric analysis and quantum information theory”, by Guillaume Auburn and Stanisław J. Szarek*, [Bulletin of the American Mathematical Society](#), 58 (2021), 277–281.
- (11) **M. Brannan**, R. Vergnioux and S. Youn, *Property RD and hypercontractivity for orthogonal free quantum groups*, [International Mathematics Research Notices](#), (2021), 1573–1601.
- (12) **M. Brannan**, B. Collins, H.H. Lee and S. Youn, *Temperley-Lieb quantum channels*, [Communications in Mathematical Physics](#) 376 (2020), 795–839.
- (13) **M. Brannan**, A. Chirvasitu, and A. Freslon, *Topological generation and matrix models for quantum reflection groups*, [Advances in Mathematics](#), 363 (2020), 106982.
- (14) **M. Brannan**, A. Chirvasitu, K. Eifler, S. Harris, V. Paulsen, and X. Su, *Bigalois extensions and the graph isomorphism game*, [Communications in Mathematical Physics](#) 375 (2020), 1777–1809.
- (15) **M. Brannan** and B. Collins, *Entanglement and the Temperley-Lieb Category*, [Contemporary Mathematics](#) 747 (2020), 27–50.
- (16) A. Bhattacharya, **M. Brannan**, A. Chirvasitu, and S. Wang, *Property (T), property (F) and residual finiteness for discrete quantum groups*. [Journal of Noncommutative Geometry](#), 14 (2020), 567–589.

- (17) **M. Brannan** and S. Youn, *On the similarity problem for locally compact quantum groups*. [Journal of Functional Analysis](#) 276 (2019), 1313–1337.
- (18) **M. Brannan** and B. Collins, *Dual bases in Temperley-Lieb algebras*, [Advanced Studies in Pure Mathematics](#) 80 (2019), 43–52.
- (19) **M. Brannan** and D. Kerr, *Quantum groups, property (T), and weak mixing*, [Communications in Mathematical Physics](#) 360 (2018), 1043–1059.
- (20) **M. Brannan** and B. Collins, *Dual bases in Temperley-Lieb algebras, quantum groups, and a question of Jones*, [Quantum Topology](#) 9 (2018), 715–748.
- (21) **M. Brannan** and R. Vergnioux, *Orthogonal free quantum group factors are strongly 1-bounded*, [Advances in Mathematics](#) 329 (2018), 133–156.
- (22) S. Avsec, **M. Brannan** and M. Wasilewski, *Complete metric approximation property for q -Araki-Woods algebras*, [Journal of Functional Analysis](#) 274 (2018), 544–572.
- (23) **M. Brannan** and B. Collins, *Highly entangled, non-random subspaces of tensor products from quantum groups*, [Communications in Mathematical Physics](#) 358 (2018), 1007–1025.
- (24) **M. Brannan** and Z.-J. Ruan, *L_p -representations of discrete quantum groups*, [Journal für die Reine und Angewandte Mathematik \(Crelle's Journal\)](#), 732 (2017), 165–210.
- (25) **M. Brannan**, B. Forrest and C. Zwarich, *Leinert sets and complemented ideals in Fourier algebras*, [Studia Mathematica](#) 239 (2017), 273–296.
- (26) **M. Brannan**, *Approximation properties for locally compact quantum groups*, [Banach Center Publications](#) 111 (2017), 185–232.
- (27) **M. Brannan**, B. Collins and R. Vergnioux, *The Connes embedding property for quantum group von Neumann algebras*. [Transactions of the American Mathematical Society](#) 369 (2017), 3799–3819.
- (28) **M. Brannan** and K. Kirkpatrick, *Quantum groups and generalized circular elements*. [Pacific Journal of Mathematics](#) 282 (2016), 35–61.
- (29) **M. Brannan**, *Strong asymptotic freeness for free orthogonal quantum groups*, [Canadian Mathematical Bulletin](#) 57 (2014), 708–720.
- (30) **M. Brannan** and B. Forrest, *Extending multipliers of the Fourier algebra from a subgroup*, [Proceedings of the American Mathematical Society](#) 142 (2014), 1181–1191.
- (31) **M. Brannan**, *Reduced operator algebras of trace-preserving quantum automorphism groups*, [Documenta Mathematica](#) 18 (2013), 1349–1402.
- (32) **M. Brannan**, M. Daws and E. Samei, *Completely bounded representations of convolution algebras of locally compact quantum groups*, [Münster Journal of Mathematics](#) 6 (2013), 445–482.
- (33) **M. Brannan**, *Approximation properties for free orthogonal and free unitary quantum groups*, [Journal für die Reine und Angewandte Mathematik \(Crelle's Journal\)](#) 672 (2012), 223–251.
- (34) **M. Brannan**, *Quantum symmetries and strong Haagerup inequalities*, [Communications in Mathematical Physics](#) 311 (2012), 21–53.
- (35) **M. Brannan** and E. Samei, *The similarity problem for Fourier algebras and corepresentations of group von Neumann algebras*, [Journal of Functional Analysis](#) 259 (2010), 2073–2097.
- (36) **M. Brannan**, R. Kerman and M. L. Huang, *Error estimates for Dominici's Hermite function asymptotic formula and some applications*, [ANZIAM Journal](#) 50 (2009), 550–561.

CONFERENCE ORGANIZATION

2025 BIRS Workshop: Operator algebraic quantum groups (co-organized with Benjamin Anderson-Sackaney, Martijn Caspers, Lyudmyla Turowska, and Mateusz Wasilewski).

Banach and Operator Algebras 2024: Bi-annual international conference, this iteration will be held July 8-12 at U. Waterloo (co-organized with Matthew Kennedy, Nico Spronk, and Camila Sehnm).

Focus Semester on Quantum Information: Semester long graduate program held at the University of Saarland, Germany (co-organized with Markus Bläser, Giovanna Morigi, and Moritz Weber). September-December 2022.

LINK to conference website.

Topological Quantum groups, C^* -Tensor Categories, and Subfactors: Summer school and workshop held at University of Waterloo (co-organized with Makoto Yamashita). May 24-28, 2022.

LINK to conference website.

Brazos Analysis Seminar: A semi-annual regional conference series co-founded by Michael Brannan, Mehrdad Kalantar (U. Houston), and Tao Mei (Baylor U.).

LINK to conference website.

Non-local games in quantum information theory: AIM Workshop (co-organized with Vern Paulsen, Ivan Todorov, and Anna Vershynina) May 17-21, 2021.

2019 Great Plains Operator Theory Symposium: International operator algebra conference held at TAMU in May 2019. (Co-organized with Ken Dykema, Michael Anshelevich, Roger Smith, Guoliang Yu, and Zhizhang Xie.)

LINK to conference website.

The 2nd IAMCS Workshop on Quantum Computation and Quantum Information: Mini-workshop held held at TAMU May 13-15, 2019. (Co-organized with Andreas Klappenecker, Eric Rowell, Fang Song, and Stephan Eidenbenz (Los Alamos National Lab)).

LINK to conference website.

Free Probability - On the occasion of Roland Speicher's 60th birthday: Conference in honor of Roland Speicher's 60th Birthday (co-organized with James Mingo, Jonathan Novak, Moritz Weber and Dan Voiculescu). Saarbruecken, June 2020 (postponed due to COVID).

LINK to conference website.

Operator Algebraic Quantum Groups: Oberwolfach Mini-conference 1941a (co-organized with Martijn Caspers, Moritz Weber, Anna Wysoczanska-Kula). October 6-12, 2019.

LINK to conference website.

Probabilistic and Algebraic Methods in Quantum Information Theory: Concentration week (co-organized with Benoît Collins) held as part of the Texas A&M Workshop in Analysis and Probability. July 17-21, 2017.

LINK to conference website.

RESEARCH VISITS

Institution	Location	Period
Newton Institute, University of Cambridge	Cambridge, UK	Nov. 2024
Universität des Saarlandes	Saarbrücken, Germany	Fall 2022
Kyoto University	Kyoto, Japan	July 2018
Institut Henri Poincaré	Paris, France	Sept. 2017
Université de Caen Normandie (Prof. Invité)	Caen, France	June 2016
Seoul National University	Seoul, South Korea	Oct. 2014
Kyoto University	Kyoto, Japan	Sept.-Oct. 2014
University of California, San Diego	San Diego, California	Feb. 2014
Université de Franche-Comté	Besançon, France	March 2013
Université de Cergy-Pontoise	Cergy, France	March 2013
University of Münster	Münster, Germany	Oct. 2011
Université Paris Diderot - Paris 7	Paris, France	Oct. 2011
Universität des Saarlandes	Saarbrücken, Germany	Sept. 2011
The Erwin Schrödinger Institute	Vienna, Austria	Feb. 2011
University of Waterloo	Waterloo, Ontario	Oct. 2010
University of Saskatchewan	Saskatoon, Saskatchewan	Nov. 2009
Brock University	St. Catharines, Ontario	May-Sept. 2006

INVITED MINICOURSES AND LECTURE SERIES

- (1) **University of Cambridge:** Minicourse on operator algebraic quantum groups (given jointly with Mateusz Wasilewski), November 2024.
- (2) **Seoul National University:** Special lecture series given at the “Seminar on Noncommutative Analysis and Quantum Information Theory”, Dec. 2020.
- (3) **University of Copenhagen:** Minicourse given at the Masterclass on “Subfactors and Quantum Groups”, April 29-May 3, 2019.
- (4) **Université de Caen Normandie:** Minicourse given at the workshop *Quantum Groups: from Combinatorics to Analysis*, June 2016.
- (5) **Bedlewo, Poland:** Minicourse given at the *Graduate School on Topological Quantum Groups*, July 2015.

INVITED RESEARCH TALKS AND COLLOQUIA

- (1) **Isaac Newton Institute:** Thematic Program on Quantum information, quantum groups and operator algebras (invited speaker), Nov. 2024
- (2) **University of Alberta:** Canadian Operator Theory Symposium (plenary speaker), May 2024.
- (3) **BIRS Workshop:** Subfactors and fusion (2-)categories (invited speaker), Dec. 2023
- (4) **Fields Institute Workshop:** Twinned Conference on C^* -algebras and tensor categories (invited speaker), Nov. 2023.
- (5) **MSRI/SLMath Hot Topics Workshop:** MIP* = RE and the Connes’ Embedding Problem (invited speaker), Oct. 2023.
- (6) **Fields Institute Workshop:** Operator Algebras and Applications - Symmetry and Structure (invited 45 minute speaker), Sept. 2023.
- (7) **AMS Fall Eastern Sectional Meeting, Buffalo:** Recent developments in Operator Algebras and Quantum Information Theory (invited 45 minute speaker), Sept. 2023.
- (8) **ICMS, Edinburgh:** Analytical and Combinatorial Methods in Quantum Information Theory II, July 2023.
- (9) **Mittag-Leffler Institute, Sweden:** Non-commutative Harmonic Analysis and Quantum Information, June 2023.
- (10) **SUNY Buffalo:** Algebra Seminar, May 2023.
- (11) **Online quantum groups seminar (Copenhagen)**, April 2023.
- (12) **Michigan State University:** Mathematics Colloquium, April 2023.
- (13) **Brazos Analysis Seminar:** Texas A& M University, April 2023.
- (14) **University of Glasgow:** Analysis Seminar, December 2022.
- (15) **University of Copenhagen:** Joint Q-Lunch+Groups and Operator Algebra Seminar , November 2022.
- (16) **Saarland University:** Polish-German seminar on quantum groups, graphs and symmetries via representation theory, November 2022.
- (17) **University of Caen:** Operator Algebra Seminar , October 2022.
- (18) **Blaubeuren, Germany:** Annual Meeting of the Collaborative Research Centre (SFB): *Symbolic Tools in Mathematics and their Application*. Plenary speaker, Sept. 2022.
- (19) **University of Ottawa:** Canadian Operator Theory Symposium (plenary), June 2022.
- (20) **University of Athens:** Functional Analysis Seminar, May 2022.
- (21) **SUNY Buffalo:** Mathematics Colloquium, March 2022.
- (22) **AMS Spring Sectional Meeting:** Special Session on Recent Developments in Operator Algebras (Invited plenary speaker).
- (23) **University of Glasgow:** Analysis Seminar, February 2022.
- (24) **Queen’s University:** Mathematics Colloquium, October 2021.
- (25) **Lancaster, UK:** International Workshop on Operator Theory and Applications (IWOTA), Special Session on Operator Algebras in Quantum Theory, August 2021.
- (26) **Oberwolfach, Germany:** Quantum Groups - Algebra, Analysis and Category Theory, Sept. 2021.
- (27) **IMPAN, Poland:** Non-commutative harmonic analysis and quantum groups, Aug. 2021 (postponed).
- (28) **University of Guelph:** Canadian Operator Theory Symposium (plenary), June 2021.

- (29) **Université de Franche-Comté, Besançon, France:** Functional Analysis Seminar, Feb. 2021.
- (30) **Paris, France:** Paris Operator Algebras Seminar, Feb. 2021.
- (31) **North Carolina State University:** University Quantum Symmetries Lectures, Jan. 2021.
- (32) **Seoul National University:** Invited Lecture Series. Dec. 2020.
- (33) **University of Waterloo,** Pure Mathematics Colloquium, Nov. 2020.
- (34) **Queen's University:** Mathematics and Engineering Alumni Lecture Series, Nov. 2020.
- (35) **University of Regina:** Mathematics Colloquium, Oct. 2020.
- (36) **Vanderbilt University:** Subfactors Seminar, Oct. 2020.
- (37) **University of Pennsylvania:** 2nd Mid-Atlantic Analysis Meeting, Oct 2020.
- (38) **Michigan State University:** GOALS Workshop, July 2020.
- (39) **Fields Institute:** Canadian Operator Theory Symposium (plenary), May 2020.
- (40) **Vanderbilt University:** The Connes Embedding Problem and Quantum Information Theory, May 2020 (postponed).
- (41) **University of California, San Diego:** Analysis Seminar, March 2020.
- (42) **Baylor University:** Graduate Lecture Series, Feb. 2020.
- (43) **Purdue University:** QLA meets QIT, Nov. 2019.
- (44) **Banff International Research Station:** The Many Faceted Connes Embedding Problem, July 2019.
- (45) **University of Manitoba:** International Conference on Banach Algebras and Applications, July 2019.
- (46) **Ohio State University:** OSU Summer Research Program on Quantum Symmetries, June 2019.
- (47) **Vancouver, Canada:** CMS Winter Meeting – Special Session on Operator Algebras over Groups, Dec. 2018.
- (48) **University of Puerto Rico:** Symposium on K-theory and Noncommutative Topology, Oct. 2018.
- (49) **Indianapolis, Indiana:** Wabash Miniconference at IUPUI, Sept. 2018.
- (50) **University of Illinois:** Analysis Seminar, Sept. 2018.
- (51) **Shanghai, China:** International Workshop on Operator Theory and Applications (IWOTA), July 2018.
- (52) **Oberwolfach, Germany:** Interactions between Operator Space Theory and Quantum Probability with Applications to Quantum Information, May 2018.
- (53) **AMS Spring Central Sectional Meeting, Ohio State University.** March 2018.
- (54) **Indiana University:** Colloquium, Feb. 2018.
- (55) **Joint Mathematics Meeting, San Diego:** AMS Special Session on Advances in Operator Algebras, Jan. 2018.
- (56) **CMS Winter Meeting, Waterloo:** Special session on Operator Algebras, Dec. 2017.
- (57) **University of Texas-San Antonio:** Colloquium, Oct. 2017.
- (58) **Université Paris-Sud XI:** Analysis seminar, Sept. 2017.
- (59) **Institut Henri Poincaré, Paris:** Operator Algebras and Quantum Information Theory, Sept. 2017.
- (60) **University of Guelph:** Fields Workshop on Operator Systems in Quantum Information, Aug. 2017.
- (61) **University of Houston:** Analysis Seminar, April 2017.
- (62) **Baylor University:** Analysis seminar, March 2017.
- (63) **Institute of Mathematics, Chennai:** Conference on Non-Commutative Analysis, Feb. 2017.
- (64) **Joint Mathematics Meeting, Atlanta:** AMS Special Session on Quantum Groups, Jan. 2017.
- (65) **Banff International Research Station:** Workshop - Analytic versus Combinatorial in Free Probability, December 2016.
- (66) **AMS Fall Eastern Sectional Meeting, Bowdoin College:** Special Session on Topological Phases of Matter and Quantum Computation, September 2016.
- (67) **University of Guelph:** Fields Workshop on Representation Theory in Quantum Information, August 2016.
- (68) **Universität des Saarlandes, Germany:** Free probability seminar, June 2016.
- (69) **Université de Franche-Comté, Besançon, France:** Functional Analysis Seminar, June 2016.
- (70) **Université de Caen Normandie:** Colloquium, June 2016.
- (71) **The Great Plains Operator Theory Symposium, Urbana-Champaign, IL** Plenary speaker, May 2016.
- (72) **University of Houston:** Analysis Seminar, May 2016.

- (73) **University of California, Berkeley:** Free Probability and Large N Limit V, March 2016.
- (74) **University of Waterloo:** Analysis Seminar, Jan. 2016.
- (75) **Queen's University:** C*-Algebras, Random Matrices, Free Probability, and Beyond, Oct. 2015.
- (76) **Herstmonceux Castle, UK:** Conference on Quantum Groups and Quantum Information Theory, July 2015.
- (77) **University of California, Berkeley:** Extended Probabilistic Operator Algebra Seminar, May 2015.
- (78) **University of Manitoba:** Mathematics Colloquium, March 2015.
- (79) **Mississippi State University:** Mathematics Colloquium, Feb. 2015.
- (80) **SUNY at Albany:** Mathematics Colloquium, Feb. 2015.
- (81) **Texas A&M University:** Mathematics Colloquium, Feb. 2015.
- (82) **University of Nebraska-Lincoln:** Mathematics Colloquium, Jan. 2015.
- (83) **University of Houston:** Mathematics Colloquium, Jan. 2015.
- (84) **Miami University, Ohio:** Mathematics Colloquium, Dec. 2014.
- (85) **Purdue University, Indiana:** Operator Algebra Seminar, Nov. 2014.
- (86) **University of California, Berkeley:** Probabilistic Operator Algebra Seminar, Nov. 2014.
- (87) **Seoul National University, Korea:** Functional Analysis Seminar, Oct. 2014.
- (88) **Kyoto University, Japan:** Operator Algebra Seminar, Oct. 2014.
- (89) **Texas A&M University:** SUMIRFAS, July 2014.
- (90) **Texas A&M University:** Concentration Week on Free Probability, July 2014.
- (91) **Fields Institute:** Workshop on Operator Spaces, Locally Compact Quantum Groups and Amenability, May 2014.
- (92) **Saarbrücken, Germany:** Mini-workshop on quantum symmetries in free probability, March 2014.
- (93) **Baltimore, Maryland:** Joint Mathematics Meeting Special Session: "The progress in free analysis and free probability", Jan. 2014.
- (94) **University of Georgia:** Mathematics Colloquium, Oct. 2013.
- (95) **Fields Institute:** Workshop on Noncommutative Distributions in Free Probability Theory, July 2013.
- (96) **Department of Mathematics and Statistics, University of Ottawa:** Analysis Seminar, June 2013.
- (97) **Université de Franche-Comté, Besançon, France:** Functional Analysis Seminar, March 2013.
- (98) **Université de Cergy-Pontoise, France:** Workshop on Approximation Properties for Quantum Groups, March 2013.
- (99) **Texas A&M University:** Linear Analysis Seminar, Dec. 2012.
- (100) **Wabash College:** Wabash Modern Analysis Seminar, Dec. 2012.
- (101) **Regina, SK.:** CMS Summer Meeting (Harmonic Analysis and Operator Spaces), June 2012.
- (102) **University of Windsor:** Mathematics Colloquium, April 2012.
- (103) **University of Waterloo:** Analysis Seminar, March 2012.
- (104) **Toronto, ON:** CMS Winter Meeting (Session on Operator Algebras), Dec. 2011.
- (105) **University of Münster:** C*-algebra Seminar, Oct. 2011.
- (106) **Université Paris 7:** Operator Algebra Seminar, Oct. 2011.
- (107) **University of Waterloo:** Banach Algebras 2011, Aug. 2011.
- (108) **University of Ottawa:** Analysis Seminar, April 2011.
- (109) **Erwin Schrödinger International Institute for Mathematical Physics:** Workshop on bialgebras in free probability, Feb. 2011.
- (110) **Leeds University, UK:** Functional Analysis Seminar, Nov. 2010.
- (111) **University of Waterloo:** Analysis Seminar, Oct. 2010.
- (112) **University of Saskatchewan:** Analysis Seminar, Nov. 2009.

CONTRIBUTED LECTURES

- (1) **Texas A&M University:** Algebra and Combinatorics Seminar, April 2019.
- (2) **Texas A&M University:** Noncommutative Geometry Seminar, Oct. 2018.
- (3) **Texas A&M University:** Linear Analysis Seminar, Oct. 2017.
- (4) **Texas Christian University:** The Great Plains Operator Theory Symposium, May 2017.
- (5) **Texas A&M University:** Linear Analysis Seminar, April 2017.
- (6) **Texas A&M University:** Algebra and Combinatorics Seminar, Oct. 2016.

- (7) **Fields Institute:** The 42nd Canadian Operator Symposium (COSy), June 2014.
- (8) **IUPUI, Indianapolis:** 2013 Wabash Miniconference, Sept. 2013.
- (9) **Queen's University:** The 40th Canadian Operator Symposium (COSy), May 2012.
- (10) **Bedlewo, Poland:** Workshop on Non-Commutative Harmonic Analysis, Sept. 2011.
- (11) **University of Victoria:** The Canadian Operator Symposium (COSy), May 2011.
- (12) **Arizona State University:** The Great Plains Operator Theory Symposium, May 2011.
- (13) **University of Saskatchewan:** Canadian Abstract Harmonic Analysis Symposium, Aug. 2010.
- (14) **University of New Brunswick:** The 38th Canadian Operator Symposium (COSy), June 2010.

TEACHING EXPERIENCE

At University of Waterloo

ECE 205	<i>Advanced Calculus 1 for Electrical and Computer Engineers</i>	Winter 2024
PMATH 950	<i>Quantum Representation Theory</i>	Winter 2023
MATH 247	<i>Advanced Calculus 3</i>	Spring 2022
PMATH 450/650	<i>Fourier Analysis and Lebesgue Measure</i>	Spring 2022
PMATH 451/651	<i>Measure and Integration</i>	Winter 2022
MATH 147	<i>Advanced Calculus 1</i>	Fall 2021

At Texas A&M University

MATH 411	<i>Mathematical Probability (Regular + Honors)</i>	Spring 2021
MATH 221	<i>Several Variable Calculus (Honors)</i>	Fall 2020
MATH 304	<i>Linear Algebra (Honors)</i>	Spring 2020
MATH 663	<i>Representation Theory and Harmonic Analysis on Compact Groups</i>	Fall 2019
MATH 308	<i>Differential Equations</i>	Fall 2019
MATH 409	<i>Advanced Calculus I (Honors)</i>	Spring 2019
MATH 308	<i>Differential Equations</i>	Fall 2018
MATH 608	<i>Real Variables II</i>	Spring 2018
MATH 663	<i>Subfactors, Knots and Planar Algebras</i>	Fall 2017
MATH 685	<i>Directed Studies</i>	Spring 2017
MATH 447	<i>Principles of Analysis II (Honors)</i>	Spring 2017
MATH 411	<i>Mathematical Probability (Honors)</i>	Fall 2016
MATH 656	<i>Functional Analysis II</i>	Spring 2016
MATH 151	<i>Engineering Mathematics I</i>	Fall 2015

At the University of Illinois

MATH 231	<i>Calculus II</i>	Spring 2015
MATH 286	<i>Introduction to differential equations plus (Course Coordinator)</i>	Spring 2014
MATH 286	<i>Introduction to differential equations plus</i>	Fall 2013
MATH 595	<i>Approximation properties for groups and modular theory</i>	Spring 2013
MATH 286	<i>Introduction to differential equations plus</i>	Fall 2012

At Queen's University

MATH 228	<i>Complex Analysis for Electrical and Computer Engineering</i>	Winter 2012
MATH 228	<i>Complex Analysis for Electrical and Computer Engineering</i>	Winter 2011

ADVISING AND MENTORING

Postdoctoral Fellow Advising

- (1) **Roberto Hernandez-Palomares:** Postdoc Mentor, 2023-present.
- (2) **Camila Sehnem:** Postdoc Mentor, 2022–present.
- (3) **Samuel Harris:** Postdoc Mentor, 2019–2022. (Now tenure-track at Northern Arizona U.).
- (4) **Li Gao:** Postdoc Mentor, 2018–2021. (Now tenure track at U. Houston).

Graduate Student Advising

- (1) **Adina Goldberg:** Ph.D., in progress.
- (2) **Alec Gow:** Ph.D., in progress.

- (3) **Aareyan Manzoor**: M.Math, in progress.
- (4) **Erik Seguin**: Ph.D., in progress.
- (5) **Jennifer Zhu**: Ph. D., in progress.
- (6) **Padraig Daly**: Ph.D., Spring 2023. (Subsequent position: Industry)
- (7) **John Weeks**: Ph. D., Spring 2022. (Subsequent position: Permanent Leturer at TAMU).
- (8) **Benjamin Anderson-Sackaney**, Spring 2022. (Subsequent position: Postdoc at the University of Caen, France).
- (9) **Priyanga Ganesan**: Ph. D., Spring 2022. (Subsequent position: Postdoc at UCSD and Copenhagen)
- (10) **Kari Eifler**: Ph. D., Spring 2021. (Subsequent position: Data Scientist at Microsoft)
- (11) **Tristan Pace**: M.Sc., Spring 2019. (Subsequent position: Ph.D. Student at UT Austin)
- (12) **Xiaoyu Su**: M.Sc., Spring 2019. (Subsequent position: Ph.D. Student at TAMU)
- (13) **Mateusz Wasilewski** (Feb.-May 2018): Visiting doctoral student from IMPAN. Now assistant professor at IMPAN.
- (14) **Sang-gyun Youn** (Sept.-Dec. 2016): Visiting doctoral student from Seoul National University. Now assistant professor at Seoul National University.

Undergraduate Student Advising

I have organized the following undergraduate research projects.

- (1) **Stefan Frunza** (Fall 2023): Project – “Harmonic Analysis on Rigid C^* -tensor categories”.
- (2) **Nick Priebe** (Summer 2023): Project – “Hadamard matrices and their quantum symmetries”.
- (3) **Noah Fournier, Daniel Kimble and Braden Yosko** (Spring 2020): Project – “Topological Quantum Computation”. (Supervised jointly with E. Rowell (TAMU MATH) and A. Klappenecker (TAMU CS)).
- (4) **Xiaoyu Su** (Spring 2018): Capstone project - “Quantum symmetries and non-local games”.
- (5) **Nathan Mehlhop, William Ogletree** (Fall 2017): Capstone project - “Quantum channels from quantum groups”.
- (6) **Josiah Blaisdell, Nathan Mehlhop, William Ogletree** (June-Aug. 2017): I mentored three undergraduate TAMU students on a research project titled “Quantum symmetries and quantum channels.” Funding source: NSF grant DMS-1700267.
- (7) **Matthew Gaikema, Madeline Hansalik, Songyu He, Nathan Mehlhop** (June-Aug. 2016): I co-organized (jointly with Michael Anshelevich) a 2016 Summer Undergraduate Research Project in Analysis at Texas A&M. Project title: *Matrix-valued Brownian motion and combinatorial problems on symmetric groups*.

SERVICE

Editorial Board Work

- London Mathematical Society (LMS): Member of the editorial board for the Bulletin of the LMS and Journal of the LMS. (September 2023-Present).

Departmental Committee Work

- Member: UW Pure Mathematics Department Hiring Committee (DACA), July 2023-June 2026.
- Member: UW Pure Mathematics Qualifying Exams Committee, July 2022-July 2024.
- Member: UW Pure Mathematics Graduate Program Committee, July 2021-June 2023.
- Member: TAMU Mathematics Department Teaching Committee, Fall 2020-Spring 2021.
- Member: TAMU Mathematics Department Head Search Committee, Spring 2019.

Thesis Committee Work (year of defense indicated if applicable)

- Ph.D. Advisor: Ph.D. Advisory Committee (Alec Gow), UW Pure Mathematics.
- Ph.D. Advisor: Ph.D. Advisory Committee (Adina Goldberg), UW Pure Mathematics.
- Ph.D. Co-Advisor: Ph.D. Advisory Committee (Erik Seguin), UW Pure Mathematics.
- Ph.D. Advisor: Ph. D. Advisory Committee (Jennifer Zhu), UW Pure Mathematics.
- Ph.D. Co-Advisor: Ph.D. Advisory Committee (Padraig Daly), UW Pure Mathematics, 2023.
- Ph.D. Co-Advisor: Ph.D. Advisory Committee (Banjamin Anderson-Sackaney), UW Pure Mathematics, 2022.

- Chair: Ph. D. Thesis Committee (John Weeks), TAMU Mathematics, 2022.
- Chair: Ph. D. Thesis Committee (Priyanga Ganesan), TAMU Mathematics, 2022.
- Chair: Ph. D. Thesis Committee (Kari Eifler), TAMU Mathematics, 2021.
- Chair: M.Sc. Thesis Committee (Tristan Pace), TAMU Mathematics, 2019.
- Chair: M.Sc. Thesis Committee (Xiaoyu Su), TAMU Mathematics, 2019.
- Member: Ph. D. Thesis Committee (Mingyu Liu), TAMU Mathematics, 2019.
- Member: Ph. D. Thesis Committee (James O'quinn), TAMU Mathematics, 2020.
- Member: Ph. D. Thesis Committee (John Griffin), TAMU Mathematics, 2021.
- Member: Ph. D. Thesis Committee (Jacob Mashburn), TAMU Mathematics, 2022.
- Member: Ph. D. Thesis Committee (Geng Tian), TAMU Mathematics, 2019.
- Member: M. Sc. Committee (Linda Gaines), TAMU Statistics, 2018.
- Member: Ph. D. Thesis Committee (Kagan Samurkas), TAMU Mathematics, 2018.
- Member: M. Sc. Committee (Can Pu), TAMU Mathematics, 2018.
- Member: M. Sc. Committee (Lucas Hall), TAMU Mathematics, 2018.
- Member: M.Sc. Thesis Committee Member (Stephen Hege), TAMU Statistics, 2017.
- Member: Ph.D. Thesis Committee (David Buzinski), TAMU Mathematics, 2017.
- Member: Ph.D. Preliminary Exam Committee (Sepideh Rezvani), U. Illinois, 2013.

Seminar Organization

- Analysis Seminar, U. Waterloo, Fall 2021-Present.
- Hadamard Learning Seminar, Spring 2023.
- Working Seminar on Quantum Computation and Quantum Information, TAMU, Summer 2017–Summer 2020.
- Free Probability Seminar, TAMU, Spring 2017.
- Linear Analysis Seminar, TAMU, Fall 2015–Spring 2021.
- Working Seminar on Quantum Groups, TAMU, Fall 2015, Fall 2016, Spring 2019.

Mathematical Reviews

- **Reviewer since June 2016.**

External Grant Reviewer

- **NSERC Discovery Grants (2022-present).**
- **ANR, France.**
- **NCN, Poland.**

Book Reviews

- **Reviewer for Cambridge University Press**

Other

- Senior Mentor: Operator Algebras Mentor Network, 2019-present.
- Faculty volunteer: Texas A&M Mathematics Fair, April 2016.

Journal Refereeing

- **Archiv der Mathematik**
- **Annales Henri Poincaré**
- **Banach Journal of Mathematical Analysis**
- **Bulletin of the London Mathematical Society**
- **Canadian Journal of Mathematics**
- **Canadian Mathematical Bulletin**
- **Communications in Mathematical Physics**
- **Crelle's Journal für die Reine und Angewandte Mathematik**
- **Illinois Journal of Mathematics**
- **Infinite Dimensional Analysis, Quantum Probability and Related Topics**
- **International Journal of Mathematics**
- **Indiana University Mathematics Journal**
- **Inventiones Mathematicae**
- **Journal of Mathematical Analysis and Applications**

- **Journal of Mathematical Physics**
- **Journal of Functional Analysis**
- **Journal of the London Mathematical Society**
- **Journal of Noncommutative Geometry**
- **Journal of Topology and Analysis**
- **Proceedings of the American Mathematical Society**
- **Proceedings of the London Mathematical Society**
- **Probability Theory and Related Fields**
- **Random Matrices and their Applications**
- **Mathematische Annalen**
- **Mathematical Physics, Analysis and Geometry**
- **Science China - Mathematics**
- **Transactions of the American Mathematical Society**