Matthew S. McBride

CONTACT INFORMATION

Mississippi State University
Department of Mathematics and Statistics
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RESEARCH INTERESTS

Functional Analysis, Noncommutative Geometry, Operator Theory

EDUCATION

Purdue University, West Lafayette, Indiana.

Ph.D., Pure Mathematics, August 2012.

Wright State University, Dayton, Ohio.

M.S., Pure Mathematics, June 2007.

Purdue University, West Lafayette, Indiana.

B.S., Pure Mathematics, December 2005.

POSITIONS

Associate Professor, Mississippi State University, Department of Mathematics and Statistics. August 2021 - present.

Assistant Professor, Mississippi State University, Department of Mathematics and Statistics. August 2015 - July 2021.

Visiting Assistant Professor (Postdoctoral Position), University of Oklahoma, Department of Mathematics. August 2012 - June 2015.

PAPERS

1. "D-Bar Operators in Quantum Domains," with Slawomir Klimek. *Math. Phys. Anal. Geom.*, **13**, 357–390, 2010.

2. "A Note on Dirac Operators on the Quantum Punctured Disk," with Slawomir Klimek. *SIGMA*, **6**, 56–68, 2010.

3. "Classical Limit of the D-Bar Operator on Quantum Domains," with Slawomir Klimek. *Jour. Math. Phys.*, **52**, 1–16, 2011.

4. "Global Boundary Conditions for a Dirac Operator on the Solid Torus," with Slawomir Klimek. *Jour. Math. Phys.*, **52**, 1–14, 2011.

5. "A Note on Gluing Dirac Type Operators on a Mirror Quantum Two-Sphere," with Slawomir Klimek. *SIGMA*, **10**, 1–15, 2014.

6. "A p-Adic Spectral Triple," with Slawomir Klimek and Sumedha Rathnayake. *Jour. Math. Phys.*, **55**, 1–17, 2014.

7. "The Marchenko Representation of Reflectionless Jacobi and Schrödinger Operators," with Injo Hur and Christian Remling. *Trans. Amer. Math. Soc.*, **9947**, 1–20, 2015.

8. "The Quantum Pair of Pants," with Slawomir Klimek, Sumedha Rathnayake, and Kaoru Sakai. *SIGMA*, **012**, 1–22, 2015.

9. "Estimates in Generalized Morrey Spaces for Linear Parabolic Systems," *Jour. Math. Anal. Appl.*, **452**, 1019–1030, 2017.

10. "Derivations and Spectral Triples on Quantum Domains I: Quantum Disk," with Slawomir Klimek, Sumedha Rathnayake, Kaoru Sakai, and Honglin Wang. *SIGMA*, **013**, 1–26, 2017.

11. "Derivations and Spectral Triples on Quantum Domains II: Quantum Annulus," with Slawomir Klimek and Sumedha Rathnayake. *Sci. Chi. Math.*, **12**, 2463–2486, 2019.

12. "Action of Complex Symplectic Matrices on the Siegel Half Space," with Keshav Acharya. *Lin. Alg. Appl.*, **563**, 47–62, 2019.

13. "Unbounded Derivations in Bunce-Deddens-Toeplitz Algebras," with Slawomir Klimek, Sumedha Rathnayake, Kaoru Sakai, and Honglin Wang. *Jour. Math. Anal. Appl.*, **15**, 988–1020, 2019.

14. "A Note on Spectral Triples on the Quantum Disk," with Slawomir Klimek and John Wilson Peoples. *SIGMA*, **015**, 1–8, 2019.

15. "Dirac Type Operators on the Quantum Solid Torus with Global Boundary Conditions," with Slawomir Klimek. *Jour. Math. Anal. Appl.*, **484**, 1–26, 2020.

16. "A Value Region Problem for Continued Fractions and Discrete Dirac Equations," with Slawomir Klimek, Sumedha Rathnayake, and Kaoru Sakai. *Hokk. Math. Jour.*, **49**, 1–16, 2020.

17. "Derivations and Reflection Positivity on the Quantum Cylinder," with Slawomir Klimek. *Sci. Chi. Math.*, **63**, 2037–2054, 2020.

18. "Unbounded Derivations on Algebras Associated with Monothetic Groups," with Slawomir Klimek. *Jour. Aust. Math. Soc.*, **10**, 1–27, 2020.

19. "Half Line Titchmarsh-Weyl m-Functions of Vector-valued Discrete Schrödinger Operators," with Keshav Acharya. *Annal. Func. Anal.*, **53**, 1–21, 2021.

20. "Noncommutative Geometry of the Quantum Disk," with Slawomir Klimek and John Wilson Peoples. *Annal. Func. Anal.*, **53**, 1–55, 2022.

21. "A Note on Quantum Odometers," with Slawomir Klimek and John Wilson Peoples. *Sci. Chi. Math.*, **65**, 1–15, 2022.

22. "Aspects of Noncommutative Geometry on Bunce-Deddens Algebras," with Slawomir Klimek and John Wilson Peoples. *Jour. Noncom. Geom.*, 17, 1391–1423, 2023.

23. "Compact Linear Relations and their Spectral Properties," with Keshav Acharya. *Elec. Jour. Math. Anal. Appl.*, **11**, 116–128, 2023.

24. "Implementations of Derivations on the Quantum Annulus," with Slawomir Klimek and Kaoru Sakai. *Hokk. Math. Jour.*, **53**, 421–441, 2023.

25. "Crossed Product C^*-algebras Associated with p-Adic Multiplication,", with Shelley Hebert, Slawomir Klimek and John Wilson Peoples. *Annal. Func. Anal.*, **70**, 1–23, 2024.

26. "Noncommutative Geometry of the Hensel-Steinitz Algebra," with Shelley Hebert, Slawomir Klimek and John Wilson Peoples. Submitted.

27. "A Pile of Shifts I: Crossed Products," with Shelley Hebert and Slawomir Klimek. Submitted.

28. "A Pile of Shifts II:," with Shelley Hebert, Slawomir Klimek and John Wilson Peoples. Preprint.

Courses Taught

Mississippi State University: 2015 - present.

Foundations of Mathematics. MA 3053. (Sp 2020, Fa 2019, Sp 2019, Sp 2017, Sp 2016)

Introduction to Linear Algebra. MA 3113. (Fa 2015)

Introduction to Modern Algebra. MA 3163. (Fa 2016, Sp 2016)

Advanced Calculus I. MA 4633/6633. (Fa 2024, Fa 2023, Fa 2022, Fa 2021, Fa 2020, Fa 2018)

Advanced Calculus II. MA 4643/6463. (Sp 2025, Sp 2024, Sp 2023, Sp 2022, Sp 2021)

Math Analysis I. MA 4933/6933. (Fa 2017)

Math Analysis II. MA 4943/6943. (Sp 2018)

Real Analysis I. MA 8633. (Fa 2024, Fa 2022, Fa 2020, Fa 2018, Fa 2017)

Real Analysis II. MA 8643. (Sp 2025, Sp 2023, Sp 2021, Sp 2019, Sp 2018)

Functional Analysis I. MA 8663. (Fa 2023, Fa 2021, Fa 2019, Fa 2016)

Functional Analysis II. MA 8673. (Sp 2024, Sp 2022, Sp 2020, Sp 2017)

University of Oklahoma: 2012 - 2015.

Calculus and Analytic Geometry III. MATH 2433. (Fa 2013)

Calculus and Analytic Geometry IV. MATH 2443. (Su 2014, Su 2013)

Differential and Integral Calculus II. MATH 2924. (Su 2015)

Introduction to Ordinary Differential Equations. MATH 3113. (Fa 2014, Sp 2013, Fa 2012)

Linear Algebra I. MATH 3333. (Sp 2015)

Introduction to Partial Differential Equations. MATH 4163. (Su 2015, Fa 2014, Su 2014, Sp 2014)

Indiana University - Purdue University Indianapolis (IUPUI): 2009 - 2012.

Brief Survey of Calculus I. MATH M119. (Sp 2010)

Calculus for Technology I. MATH 22100. (Su 2012, Fa 2009)

Analytic Geometry and Calculus I. MATH 16500. (Fa 2010)

Analytic Geometry and Calculus II. MATH 16600. (Fa 2011)

Real Analysis for Teachers I. MATH 54700. (Su 2011)

Wright State University: 2006 - 2007.

Algebra I. MTH 126. (Sp 2007, Fa 2006)

Algebra II. MTH 127. (Sp 2006)

Awards

GAANN Fellowship, IUPUI Department of Mathematical Sciences. 2011 - 2012.

GAANN Fellowship, IUPUI Department of Mathematical Sciences. 2010 - 2011.

Outstanding Advanced Graduate Student Award. 2010.

GAANN Fellowship, IUPUI Department of Mathematical Sciences. 2009 - 2010.

Outstanding Advanced Graduate Student Award. 2009.

IUPUI School of Science Fellowship. 2008 - 2009.

IUPUI School of Science Fellowship. 2007 - 2008.

Service

Undergraduate Coordinator. 2018 - present.

Served on Evaluation of Classroom and Teaching Committee. 2018 - present.

Chair of the Departmental Promotion and Tenure Committee. 2023 - present.

Served on Departmental Advisory Committee. 2022 - present.

Served on Hiring Committee. 2016 - present.

Served on Graduate Coordinating Committee. 2017 - 2018.

Chair of Graduate Recruitment Committee. 2016 - present.

Chair of Math Club and Putnam Exam sessions. 2015 - present.

Ph.D. students mentored. 2018 - 2021(Rachel Barber), 2021 - 2024(Shelley Hebert) academic years.

Master's students' projects mentored. 2015 - 2016(Xiao Wang), 2017 - 2018(Jabbar Lindsey, Tyler Williams), 2018 - 2019(Jeffrey Jones), 2024 - 2025(John McCommon, Jonas Stuart) academic years.

Undergraduate student research mentored. 2014 - 2015, 2019 - 2021(Jacob Lee) academic years.

Served on PhD student committees, four students total.

Served on Master's student committees, twelve students total.

Reviewer for the AMS. 2017 - present.

Reviewed mathematics textbooks. 2016(Introduction to proof textbook and an abstract algebra textbook), 2017(Undergraduate real analysis textbook).

Refereed mathematics articles. 2012(one in Math. Phys. Anal. Geom., one in Jour. Math. Phys.), 2016(two in Ind. Univ. Math. Jour., one in Rep. Math. Phys.), 2020(one in Adv. In Math.), 2021(one in Nonlin. Func. Anal. Appl.), 2023(one in Kyung. Math. Jour., one in Bull. Kore. Math. Soc.), 2024(one in Jour. Pseudo-diff. Ops. Appl.).

Written over 50 letters of recommendation.

Articulated over 200 course equivalences.

Conference and Seminar Talks

"Derivations on Smooth Subalgebras", Noncommutative Geometry in NYC, St. John's University,

March 2024.(Invited)

"Crossed Product C*-algebras Associated with p-adic Multiplication", Noncommutative Geometry in NYC, St. John's University, January 2024.(Invited)

"Bounded and Unbounded Derivations on C^*-algebras", Trojan Math Seminar, Troy University, September 2021.(Invited)

"Derivations: Bounded and Unbounded", MathFest, Troy University, April 2021.(Contributed)

"Noncommutative Geometry and the Quantum Disk", MathFest, Troy University, April 2019.(Contributed)

"Unbounded Derivations in Quantum Domains", Analysis Seminar, University of Mississippi, April 2018.(Invited)

"Noncommutative Geometry Workshop", Analysis Seminar, Mississippi State University, Fall 2015.(Seminar Series)

"The Quantum Pair of Pants", Joint Mathematics Meetings 2015, San Antonio, January 2015.(Contributed)

"The Marchenko Representation on Reflectionless Jacobi and Schrödinger Operators", Texas PDE Conference 2014, University of North Texas, March 2014.(Invited)

"Dirac Operators on the Solid Torus with Global Boundary Conditions", Oklahoma PDE Workshop, Oklahoma State University, October 2013.(Invited)

"D-bar Operators in Commutative and Noncommutative Domains", AMS Sectional Meeting, Washington University in St. Louis, October 2013.(Contributed)

"Dirac Operators on the Quantum Punctured Disk", Wabash Extramural Modern Analysis Miniconference, IUPUI, October 2010.(Invited)

"D-bar Operators in Quantum Domains", Wabash Extramural Modern Analysis Miniconference, IUPUI, October 2009.(Invited)

"The D-bar Operator in the Commutative and Noncommutative disk.", IUPUI Mathematical Physics Seminar, IUPUI, October 2009.(Contributed)

"Dirac Type Operators on the Noncommutative Cylinder", MAA Conference, IUPUI, March 2009.(Invited)

Talks at University of Oklahoma

"Dirac Operators on a Mirror Quantum Two-Sphere", Analysis and Convexity Seminar, Spring 2014.

"D-bar Operators on Complex Domains", Graduate Student Analysis Seminar, Spring 2013.

"Analysis of p-Adic Numbers", Math Fest, Spring 2013.

"D-bar Operators on the Classical and Quantum Disk and Annulus - part II", Analysis and Convexity Seminar, Fall 2012.

"D-bar Operators on the Classical and Quantum Disk and Annulus - part I", Analysis and Convexity Seminar, Fall 2012.

Talks at IUPUI

"Student Understanding of Proof", Math and Teaching Seminar, Spring 2011.

"Non-Inscribable Polyhedra", Graduate Student Seminar, Spring 2010.

"Riemann Manifolds part II", Graduate Student Seminar, Fall 2008.

"Riemann Manifolds part I", Graduate Student Seminar, Fall 2008.

"Estimates in the Generalized Morrey Spaces for Linear Parabolic Systems", Graduate Student Seminar, Spring 2008.

"Computer-Assisted Set-Up for the Second Derivative of the Thomas-Fermi Potential", Graduate Student Seminar, Fall 2007.

Conferences Attended

MathFest, Troy University, April 2021.

MathFest, Troy University, April 2019.

Rivière-Fabes Symposium, University of Minnesota, April 2015.

Joint Mathematics Meetings 2015, San Antonio, January 2015.

Noncommutative Geometry Festival, Texas A & M University, April/May 2014.

Rivière-Fabes Symposium, University of Minnesota, April 2014.

Texas PDE Conference 2014, University of North Texas, March 2014.

Oklahoma PDE Workshop, Oklahoma State University, October 2013.

AMS Sectional Meeting, Washington University in St. Louis, October 2013.

Rivière-Fabes Symposium, University of Minnesota, April 2013.

AMS Sectional Meeting, University of Nebraska-Lincoln, October 2011.

Wabash Extramural Modern Analysis Miniconference, IUPUI, October 2010.

Wabash Extramural Modern Analysis Miniconference, IUPUI, October 2009.

MAA Conference, IUPUI, March 2009.