Jonathan Stanfill

Curriculum Vitae

Department of Mathematics, Baylor University
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"The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve."
- Eugene Wigner, *The Unreasonable Effectiveness of Mathematics in the Natural Sciences*

Education

2018–Present **Ph.D. in Mathematics**, *Baylor University*, Anticipated Completion: Spring 2022, Thesis: *Spectral functions for Sturm–Liouville operators* (in progress).
Advisors: Fritz Gesztesy and Klaus Kirsten

2016–2018 **M.S. in Mathematics**, *Baylor University*.

2007–2011 **B.A. in Mathematics with Minors in Physics and Military Leadership**, *Carson-Newman University*.

Academic Experience

2017–Present **Graduate Assistant and Teacher of Record**, *Baylor University*.

2016–2017 **Graduate Assistant**, *Baylor University*.

Leadership Experience

2020–2022 **Conyers Scholars Program Leader**, *Baylor University*.

2020–2021 **Doctoral Administrative Fellow**, *Baylor University*.

2011-2015 **United States Army Officer**, 2nd Brigade Combat Team, 82nd Airborne Division, Fort Bragg, NC; Highest Rank Held: **Captain**

2014–2015 Battalion Plans and Air Officer, 407th Brigade Support Battalion (BSB)

2014 Liaison to 16th Air Assault Brigade, Colchester, England (British Army)

2013–2014 Company Executive Officer, A Company, 407th BSB

2011–2013 Platoon Leader/Maintenance Control Officer, 1-325 Airborne Infantry Regiment

Research Interests

Spectral Theory, Operator Theory, Orthogonal Polynomials, Special Functions, Mathematical Physics

Peer-Reviewed Articles

[4] *Spectral ζ-functions and ζ-regularized functional determinants for regular Sturm–Liouville operators*, with G. Fucci, F. Gesztesy, and K. Kirsten. To appear in Research in Math. Sciences, 44 pp. (arXiv)

[3] *The Krein–von Neumann extension revisited*, with G. Fucci, F. Gesztesy, K. Kirsten, L. L. Littlejohn, and R. Nichols. Applicable Anal., 25 pp., (2021). (Article, arXiv)

[2] *Bessel-type operators and a refinement of Hardy's inequality*, with F. Gesztesy and M. M. H. Pang. To appear in *From Operator Theory to Orthogonal Polynomials, Combinatorics, and Number Theory. A Festschrift in honor of Lance L. Littlejohn's 70th birthday*, F. Gesztesy and A. Martinez-Finkelshtein (eds.), Operator Theory: Advances and Applications, Birkhäuser, Springer, 25 pp. (Book, arXiv)

[1] *A survey of some norm inequalities*, with F. Gesztesy and R. Nichols. Complex Anal. and Oper. Theory **15**, 33 pp. (2021). (Article, arXiv)

Submitted Papers

[3] *Donoghue m-functions for singular Sturm–Liouville operators*, with F. Gesztesy, L. L. Littlejohn, R. Nichols, and M. Piorkowski. (arXiv)

[2] *Partitions with designated summands not divisible by 2^ℓ, 2, and 3^ℓ modulo 2, 4, and 3*, with D. Herden, M. Sepanski, et al. Submitted, 22 pp. (arXiv)

[1] *Counting the number of parts divisible by k in all the partitions of n whose parts have multiplicity less than k*, with D. Herden, M. Sepanski, et al. Submitted, 13 pp. (arXiv)

Preprints

[1] *On domain properties of Bessel-type operators*, with F. Gesztesy and M. M. H. Pang. (arXiv)

Papers in Preparation

[5] *Weyl–Titchmarsh–Kodaira m-functions for exceptional Laguerre and Jacobi operators*, with F. Gesztesy, L. L. Littlejohn, and M. Piorkowski.

[4] *Traces, determinants, and spectral ζ-functions for singular Sturm–Liouville operators*, with G. Fucci, F. Gesztesy, and K. Kirsten.

[3] *Factorizations and power weighted Rellich-type inequalities*, with F. Gesztesy and M. M. H. Pang.

[2] *The Jacobi operator and its Weyl–Titchmarsh–Kodaira m-functions*, with F. Gesztesy, L. L. Littlejohn, and M. Piorkowski.

[1] *The Jacobi operator and its Donoghue m-functions*, with F. Gesztesy, and M. Piorkowski.

Colloquia, Seminars, and Conference Talks

1/2022 Scheduled — *Spectral ζ-functions for singular Sturm–Liouville operators and the generalized Bessel equation*; Special Session on Recent Progress in Function Theory and Operator Theory, 2022 Joint Mathematics Meeting (JMM); Seattle, WA

11/2021 Scheduled — *The Jacobi operator and its Weyl–Titchmarsh–Kodaira m-functions*; Special Session on Harmonic Analysis and Spectral Theory, Fall Southeastern AMS Sectional Meeting (Formerly at University of South Alabama, Mobile, AL)

11/2021 Scheduled — *Spectral ζ-functions for singular Sturm–Liouville operators and the generalized Bessel equation*; Minisymposium on Spectral Theory of Discrete and Continuous Models in Quantum Mechanics, SIAM TX-LA Section Meeting; The University of Texas Rio Grande Valley, South Padre Island, TX

3/2021 — *Spectral ζ-functions and ζ-regularized functional determinants for regular Sturm–Liouville operators*; Brazos Analysis Seminar

3/2021 — *A Refinement of Hardy's Inequality*; 10th Ohio River Analysis Meeting (ORAM 10)

3/2021 — *A Refinement of Hardy's Inequality*; Southeastern Analysis Meeting (SEAM) 2021

10/2020 *Traces, Determinants, and Spectral ζ-Functions for Sturm–Liouville Operators*; Special Session on Modern Applied Analysis, Fall Southeastern AMS Sectional Meeting (formerly at University of Tennessee at Chattanooga)

3/2020 *Traces, Determinants, and Spectral ζ-Functions for Sturm–Liouville Operators*; ORAM 10; University of Kentucky, Lexington, KY (Cancelled due to COVID-19)

3/2020 *Determining Values of Spectral ζ-Functions for Sturm–Liouville Operators*; 2020 Texas Differential Equations Conference; University of Texas at Austin, TX

1/2020 *Determining Values of Spectral ζ-Functions for Sturm–Liouville Operators*; MAA General Contributed Paper Session on Analysis, 2020 JMM; Denver, CO

12/2019 *Determining Values of Spectral ζ-Functions for Regular Sturm–Liouville Operators*; Analysis Seminar; Baylor University, Waco, TX

Workshops Attended

7-12/2021 Focus Program on Analytic Function Spaces and their Applications, The Fields Institute for Research in Mathematical Sciences (Virtual)

6/2021 Online Mini-courses in Mathematical Analysis 2021, University of Padova, Italy, with the S.M. Nikol'skii Mathematical Institute, RUDN University (Virtual)

8/2020 Workshop in Analysis and Probability: Bellman Function Methods for the Hamming Cube, Texas A&M (Virtual)

8/2020 Orthogonal Polynomials, Special Functions and their Applications (OPSFA) Summer School, Radboud University, Nijmegen, the Netherlands (Cancelled due to COVID-19)

7/2020 XXI Lluís Santaló School: Random and Deterministic Point Configurations, Palacio de La Magdalena, in Santander, Spain (Cancelled due to COVID-19)

Conferences Attended

7/2021 2021 Mathematical Congress of the Americas (MCA) (Virtual)

4/2021 Barry Simon's 75th Birthday Conference (Virtual)

4/2021 TX Analysis and Mathematical Physics Symposium (TexAMP) (Virtual)

3/2021 Brazos Analysis Seminar (Virtual)

3/2021 ORAM 10 (Virtual)

3/2021 SEAM 38 (Virtual)

11/2020 Brazos Analysis Seminar, Texas A&M, College Station, TX (Virtual)

10/2020 Fall Southeastern AMS Sectional Meeting (Virtual)

8/2020 Ari Laptev's 70th Birthday Conference (Virtual)

7/2020 2nd Joint SIAM/CAIMS Annual Meeting (Virtual)

3/2020 2020 Texas Differential Equations Conference, University of Texas at Austin, TX

1/2020 TexAMP, Rice University, Houston, TX

1/2020 2020 JMM, Denver, CO

11/2019 Brazos Analysis Seminar, Baylor University, Waco, TX

3/2019 Brazos Analysis Seminar, University of Houston, Houston, TX

10/2018 TexAMP, Baylor University, Waco, TX

3/2018 Brazos Analysis Seminar, Baylor University, Waco, TX

Teaching Experience

2017–Present Department of Mathematics, Baylor University

- Calculus II (Spring 2020, Spring 2021, Fall 2021)
- Calculus I (Fall 2019, Fall 2020)
- Precalculus (Spring 2019)
- Calculus for Business Students (Spring 2018)
- Precalculus for Business Students (Fall 2017, Fall 2018)

Awards and Honors

2017–2022 **Baptist College and University (BCU) Scholar**, Baylor University

Spring 2021 Nominated for **University Outstanding Graduate Student Instructor Award**, Baylor University

2019–2021 **Schmeltekopf Fellowship for Educational Leadership**, Mentor: Lance Littlejohn, former Chair for Department of Mathematics, Baylor University

2020 **Mathematics Outstanding Graduate Student Teaching Award**, Baylor University

2019–2020 **Conyers Scholar**, Baylor University

Fall 2017 Nominated for **University Outstanding Graduate Student Instructor Award**, Baylor University

Funding

7/2021 American Mathematical Society (AMS) 2021 MCA Travel Grant

7/2020 Scholarship for Orthogonal Polynomials, Special Functions and their Applications (OPSFA) Summer School, Radboud University, Nijmegen, the Netherlands (Cancelled due to COVID-19)

3/2020 Graduate School Travel Award, Baylor University
Traces, Determinants, and Spectral ζ-Functions for Sturm–Liouville Operators; ORAM 10 (Conference cancelled due to COVID-19)

1/2020 Graduate School Travel Award, Baylor University
Determining Values of Spectral ζ-Functions for Sturm–Liouville Operators; 2020 JMM

Service

2020–2021 Served as Vice President for AMS Graduate Student Chapter at Baylor University

8/2020 Helped facilitate Workshop for Incoming Graduate Students, Baylor University

1/2020 Served as Moderator for MAA General Contributed Paper Session on Analysis, 2020 JMM; Denver, CO

11/2019 Helped facilitate the Brazos Analysis Seminar, Baylor University

10/2019 Served as Chair for Colloquium Session, *The Beauty of Virtue? Aesthetic Experience and the Cultivation of Character*, 2019 Baylor Symposium on Faith and Culture, "The Character of the University," Baylor University

10/2019 Served as Chair for Panel Presentation, *Character Formation for Engineers and Computer Scientists*, 2019 Baylor Symposium on Faith and Culture, "The Character of the University," Baylor University

9/2019 Helped facilitate the Baylor McNair Research Conference as a graduate mentor, Baylor University

Outreach

2020 Central Texas Science and Engineering Fair (CTSEF) Judge, Texas State Technical College, Waco, TX

2017–2018 Mathematics Puzzle of the Week (POTW) Competition Organizer, Baylor University

2016–2017 Mathematics POTW Competition Grader, Baylor University

Professional Development

2020 AAAS Mini Catalyzing Advocacy in Science and Engineering (CASE) Webinar: Science and Technology Policy During COVID-19

2020 Planning and Writing Successful NSF CAREER Award Proposals, Baylor University

2020 Planning and Writing Successful Science and Engineering Proposals, Baylor University

2019 Communio: A Retreat for Baylor Educators, Baylor University

2019 Teaching Capstone in Higher Education (TeaCHE) Certificate, Baylor University

2019 Institute for Faith and Learning (IFL): Forming Character in the Classroom, Baylor University

2018–2019 Preparing Our Future Faculty (PROFF) Workshops, Baylor University

2018–2019 Seminars for Excellence in Teaching (SET) Series, Baylor University

2018 Designing for Online Teaching Success (DOTS) Certificate, Baylor University

2015 Lean Six Sigma Green Belt Certification

2013 United States Army, Support Operations Officer Course, Phase I

2011 United States Army, Ordnance Basic Officer Leader Course, Fort Lee, VA

Professional Memberships

- American Association for the Advancement of Science (AAAS)
- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- 82nd Airborne Division Association
- Military Officers Association of America (MOAA)

Other

- Clearance: Secret Security Clearance (United States) Expiration: 2029
- Programming: Familiarity with Mathematica, LaTeX

Links: arXiv, Google Scholar, ORCID (0000-0002-4504-4942)

Research References

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