

William L. Blair

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Employment

Assistant Professor <i>The University of Texas at Tyler</i>	August 2024 – Present Tyler, TX, USA
Graduate Teaching Assistant <i>University of Arkansas</i>	August 2017 – May 2024 Fayetteville, AR, USA

Education

Ph.D. Mathematics. University of Arkansas <i>Thesis: "Generalizations of the Hardy Spaces and the Schwarz Boundary Value Problem"</i> <i>Advisor: Andrew S. Raich</i>	May 2024
M.S. Mathematics. University of Arkansas	December 2020
B.S. Mathematics. Henderson State University <i>Summa Cum Laude. Minor: Computer Science</i>	May 2017
A.S. National Park Community College	December 2014

Research Interests

Generalizations of classical Hardy spaces, generalized analytic functions, generalizations of generalized analytic functions, complex function theory, complex boundary value problems, distributional boundary values, atomic decompositions, bicomplex function theory and boundary value problems

Publications

9. "Bicomplex Hardy Classes of Solutions to Beltrami Equations and the Schwarz Boundary Value Problem," *J. Geom. Anal.* **36**.9, 299 (2026). <https://doi.org/10.1007/s12220-026-02537-3>
8. "Bicomplex Hardy classes of solutions to higher-order Vekua equations," *J. Math. Anal. Appl.* **558**.2, 130397 (2026). <https://doi.org/10.1016/j.jmaa.2026.130397>
7. "Generalizations of poly-Bergman Spaces and the Bitsadze equation," with B. B. Delgado, *Bol. Soc. Mat. Mex.* **31**, 132 (2025). <https://doi.org/10.1007/s40590-025-00812-x>
6. "An atomic representation for bicomplex Hardy classes," *Complex Var. Elliptic Equ.* **71**, 8 (2026). <https://doi.org/10.1080/17476933.2025.2549391>
5. "Meta-analytic functions with derivative not in a Hardy space," *Ex. Countex.* **7**, 100187 (2025). <https://doi.org/10.1016/j.exco.2025.100187>.

4. "Hardy Spaces of Solutions to Higher-Order Vekua Equations and the Schwarz Boundary Value Problem," with B. B. Delgado, *J. Geom. Anal.* **35.1**, 13 (2025).
<https://doi.org/10.1007/s12220-024-01825-0>
3. "Hardy Spaces of Meta-Analytic Functions and the Schwarz Boundary Value Problem," *Complex Anal. Synerg.* **10.3**, 13 (2024). <https://doi.org/10.1007/s40627-024-00139-9>.
2. "The Schwarz boundary value problem for boundary values in the sense of distributions," *J. Math. Anal. Appl.* **530.2**, 127690 (2024). <https://doi.org/10.1016/j.jmaa.2023.127690>
1. "An atomic representation for Hardy classes of solutions to nonhomogeneous Cauchy-Riemann equations," *J. Geom. Anal.* **33.9**, 307 (2023). <https://doi.org/10.1007/s12220-023-01374-y>

Preprints

- "The Carleson Embedding, F. and M. Riesz, and Rudin-Carleson Theorems for Bicomplex Generalized Analytic Functions," submitted.
- "Hardy Spaces of Generalized Meta-Analytic Functions," submitted.
- "Generalizations of the Dirichlet Boundary Value Problem for Bianalytic Functions," submitted.
- "Bicomplex Schwarz and Dirichlet Boundary Value Problems," submitted.
- "An Atomic Representation for Hardy Spaces of Generalized Analytic Functions," submitted.
- "On the Existence of Solutions to the Seiberg-Witten Vortex Equations with Exponential Decay on the Plane," with M. L. Nguyen, submitted.

Teaching Experience

The University of Texas at Tyler

- Probability and Statistics for Engineers and Scientists Spring 2026
- Matrix Methods in Science and Engineering Spring 2026
- Introduction to Complex Variables Fall 2025
- Calculus I Summer 2025, Fall 2025-26, Spring 2027
- Real Analysis II Spring 2025 and 2027
- Real Analysis I Fall 2024 and 2026
- Math for Business & Economics Fall 2024
- Precalculus Summer 2024 and 2026, Spring 2025

University of Arkansas

- Mathematical Reasoning in a Quantitative World Spring 2023
- Elementary Differential Equations Summer 2022 - 23
- College Algebra Fall 2018-23, Spring 2022 and 2024, Summer 2021

“Higher-Order Vekua-Hardy Spaces”

- *JMM 2026 Special Session on* January 2026
“Analysis and Differential Equations at Undergraduate Institutions” Washington, DC, USA
- November 2025
- *Analysis Seminar, Department of Mathematics, The University of Texas at Tyler* Tyler, TX, USA

“An Atomic Representation for Generalized Analytic Functions”

Analysis Seminar, Department of Mathematics, The University of Texas at Tyler February 2025
Tyler, TX, USA

“Representations by an Atomic Decomposition”

Analysis Seminar, Department of Mathematics, The University of Texas at Tyler November 2024
Tyler, TX, USA

“The Schwarz Boundary Value Problem”

Analysis Seminar, Department of Mathematics, The University of Texas at Tyler September 2024
Tyler, TX, USA

“Generalizations of the Hardy Spaces”

Colloquium, Department of Mathematics, The University of Texas at Tyler September 2024
Tyler, TX, USA

“A New Look at the Schwarz Boundary Value Problem”

- *JMM 2024 Special Session on* January 2024
“Geometric Analysis in Several Complex Variables” San Francisco, CA, USA
- December 2023
- *Graduate Student Colloquium, Dept. of Math. Sci., University of Arkansas* Fayetteville, AR, USA

“An Atomic Representation for Hardy Classes of Solutions to Nonhomogeneous Cauchy-Riemann Equations”

- September 2023
- *Analysis Seminar, Dept. of Mathematics, Washington University in St. Louis* St. Louis, MO, USA
- September 2023
- *Analysis Seminar, Dept. of Math. Sci., University of Arkansas* Fayetteville, AR, USA
- September 2023
- *Graduate Student Colloquium, Dept. of Math. Sci., University of Arkansas* Fayetteville, AR, USA
- August 2023
- *11th Workshop on Geometric Analysis of PDEs and Several Complex Variables* Serra Negra, SP, Brazil

July 2023

- *Analysis Seminar, Dept. of Mathematics, Universidade Federal de São Carlos* *São Carlos, SP, Brazil*

“Generalizations of the Hardy Spaces”

April 2023

Graduate Student Colloquium, Department of Math. Sci., University of Arkansas

Fayetteville, AR, USA

Expository Talks

“Atomic decomposition of holomorphic Hardy spaces on the complex unit disk”

October 2021

Graduate Student Colloquium, Department of Math. Sci., University of Arkansas

Fayetteville, AR, USA

“Hardy Spaces on $\mathbb{R}^n$ ”

November 2020

Graduate Student Colloquium, Department of Math. Sci., University of Arkansas

Fayetteville, AR, USA

Awards & Honors

Doctoral Student Presentation Travel Grant

2023-24

University of Arkansas

Julia Hicks Endowed Graduate Teaching Award

2021-22, 2023-24

University of Arkansas

Lawrence Jesser Toll Scholarship

2018-19, 2022-23

University of Arkansas

William Alton Anderson Scholarship

2020-21

University of Arkansas

John C. Massie Scholarship

2019-20

University of Arkansas

Ellis College Outstanding Graduating Senior Award

Spring 2017

Henderson State University

William W. Durand Scholarship

2015-16, 2016-17

Henderson State University

Student Advising

Master’s thesis advisor:

- *Title: TBD*

Student: Sara Cross

Expected Spring 2027

Master’s thesis committee member:

- *Title: “Fundamental Solutions to the Fractional Heat Operator”*

Student: Jacob Flores

Summer 2026

Senior seminar project advisor:

- Title: “The parallels and differences between complex and bicomplex numbers”
Student: Donald “Blake” Hopkins

Fall 2025

Honors contract project advisor:

- MATH 3351
Student: Zachary Paul

Spring 2026

Service to Mathematics

Joint Mathematics Meeting 2027

January 2027

Organized (with T. Gallagher and B. Bruce) the special session “Analysis and Differential Equations at Undergraduate Institutions”.

Texas Undergraduate Mathematics Conference at St. Mary’s University

Fall 2025

Volunteered to moderate panel sessions with established faculty members and current masters students from a variety of institutions where students had the opportunity to ask questions about pursuing a masters degree in mathematics. Also, moderated contributed talk sessions for undergraduates presenting their research.

Referee for the following journals:

Advances in Applied Clifford Algebras (1 paper)
Complex Analysis and Operator Theory (1 paper)
Complex Variables and Elliptic Equations (1 paper + 1 revision)
Mathematical Methods in the Applied Sciences (1 paper)
Mathematische Nachrichten (1 paper)
Journal of Mathematical Sciences (1 paper + 2 revisions)

Reviewer for Mathematical Reviews (American Mathematical Society) (6 papers)

Service to the Department of Mathematics, The University of Texas at Tyler

Organizer of the Colloquium in the Department of Mathematics

Fall 2025-Present

Co-organizer of the Analysis Seminar in the Department of Mathematics

Fall 2024-Present

11th Annual Lyceum at UT Tyler

Spring 2026

Volunteered to judge UT Tyler student research poster presentations.

Texas Undergraduate Mathematics Conference

Fall 2025

Volunteered to escort students to St. Mary’s University in San Antonio, TX where they presented their original research.

10th Annual Lyceum at UT Tyler

Spring 2025

Volunteered to judge UT Tyler student research poster presentations.

Texas Undergraduate Mathematics Conference (hosted by UT Tyler) Fall 2024

Volunteered to moderate panel sessions with established faculty members and current doctoral students from a variety of institutions where students had the opportunity to ask questions about pursuing a doctorate degree in mathematics.

Committee Work in the Department of Mathematics at UT Tyler

Curriculum Committee 2025-27

Hiring Committee (for Tenure-Track Assistant Professor) 2025-26

Putnam Exam Committee 2024-26

Graduate Committee 2024-25

Service to the Department of Mathematical Sciences, University of Arkansas

Arkansas Math Discovery Day Spring 2024

Volunteered to present a specific topic and assist event participants in exploring the associated exercises. This event is the successor of the long running annual Celebration of Mind at the University of Arkansas event.

Graduate Student Colloquium Spring 2022 - Spring 2024

Maintained role of Online Manager. This consisted of constructing and maintaining a website which includes general information about the group and information concerning future and past talks for the Graduate Student Colloquium of the Department of Mathematical Sciences at the University of Arkansas.

UARK Department of Mathematical Sciences Committee for Diversity and Inclusion 2019-20

Participated in the committee as the graduate student member. Communicated my viewpoint on specific issues and assisted in preparing the department's DEI statement.

Celebration of Mind at the University of Arkansas March 2018 and 2019

Volunteered to present a specific topic and assist event participants in exploring the associated exercises.

Service to the Department of Mathematics, Statistics, and Computer Science, Henderson State University

Henderson State University Assessment Team 2016-17

I was the undergraduate student representative to the university's assessment team. I advocated for undergraduate students during decision making and communicated my perspective on specific issues.

Service to the Community

Cookies for Proof Spring 2024

Volunteered to assist UARK faculty in presenting the prime number theorem to local high school students at the Fayetteville Public Library and provide exposure to the complex analysis tools used in proving the theorem.

MOEMS Study Group Fall 2021-23 and Spring 2022-24

Volunteered to assist group of local elementary and middle school students in preparing for national math competitions.

ACTM High School Mathematics Competition hosted by UARK

March 2019 and 2023

Volunteered to assist in grading exams and various other tasks associated with facilitating the competition.

FPL Math/Coding Club

Spring 2023

Assisted a joint team of faculty from the Departments of Mathematical Science and Computer Science at the University of Arkansas in offering an extra curricular club at the Fayetteville Public Library for local high school students interested in mathematics and computer programming.

AMC 10/12 Study Group

Fall 2021-22

Volunteered to assist group of local high school students in preparing for national math competitions.

Professional Development

Association of College and University Educators (ACUE) Courses

Promoting Active Learning

Summer 2026

Membership

American Mathematical Society

2017 - Present