William L. Blair

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Employment

Assistant Professor   August 2024 – Present
The University of Texas at Tyler   *Tyler, TX*

Graduate Teaching Assistant   August 2017 – May 2024
University of Arkansas   *Fayetteville, AR*

Education

Ph.D. Mathematics. University of Arkansas   May 2024
Thesis: "Generalizations of the Hardy Spaces and the Schwarz Boundary Value Problem"
Advisor: Andrew S. Raich

M.S. Mathematics. University of Arkansas   December 2020

B.S. Mathematics. Henderson State University   May 2017
Summa Cum Laude. Minor: Computer Science

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

Publications

"Bicomplex Hardy Classes of Solutions to Higher-Order Vekua Equations," submitted.

"An Atomic Representation for Bicomplex Hardy Classes," submitted.

"Existence of Solutions to the Seiberg-Witten Vortex Equations with Exponential Decay on the Plane," with M. L. Nguyen, submitted.

"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

"Meta-Analytic Functions With Derivative Not in a Hardy Space," submitted.

"Hardy Spaces of Meta-Analytic Functions and the Schwarz Boundary Value Problem," *Complex Anal. Synerg.* 10.13 (2024). https://doi.org/10.1007/s40627-024-00139-9.

"The Schwarz boundary value problem for boundary values in the sense of distributions," *J. Math. Anal. Appl.* 530.2 (2024). https://doi.org/10.1016/j.jmaa.2023.127690

"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

Teaching Experience

The University of Texas at Tyler

- Real Analysis 2   Spring 2025
- Real Analysis 1   Fall 2024
- Math for Business & Economics   Fall 2024
- Precalculus   Summer 2024, 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

Conference Invitations/Research Talks

"Representations by an Atomic Decomposition"   November 2024
Analysis Seminar, Department of Mathematics, The University of Texas at Tyler   *Tyler, TX, USA*

"The Schwarz Boundary Value Problem"   September 2024
Analysis Seminar, Department of Mathematics, The University of Texas at Tyler   *Tyler, TX, USA*

"Generalizations of the Hardy Spaces"   September 2024
Colloquium, Department of Mathematics, The University of Texas at Tyler   *Tyler, TX, USA*

"A New Look at the Schwarz Boundary Value Problem"

                                                                          January 2024

- *JMM 2024 Special Session on "Geometric Analysis in Several Complex Variables"*   *San Francisco, CA*

                                                                          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*

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- *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
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"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
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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

Service

Texas Undergraduate Mathematics Conference   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.

Co-organizer of Analysis Seminar in the Department of Mathematics at UT Tyler 2024-Present

Committee Work in the Department of Mathematics at UT Tyler
Graduate Committee   *2024-25*
Putnam Exam Commitee   *2024-25*

Reviewer for Mathematical Reviews (American Mathematical Society)   Spring 2024-Present

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.

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.

Graduate Student Colloquium   Spring 2022 - Spring 2024
Maintained role of Online Manger. 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.

AMC 10/12 Study Group   Fall 2021-22
Volunteered to assist group of local high school students in preparing for national math competitions.

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.

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.