Employment

University of Michigan - Ann Arbor, Michigan 2021 - 2025
Postdoctoral assistant professor (mentor: P. D. Miller)
James Van Loo postdoctoral fellow (2021-2024)

KTH Royal Institute of Technology - Stockholm, Sweden 2019 - 2021
Postdoctoral researcher (mentor: J. Lenells)

University of Central Florida - Orlando, Florida 2012 - 2019
Graduate teaching/research associate

Education

Ph.D., Mathematics, University of Central Florida 2019
(advisors: A. Tovbis and A. Katsevich)
M.S., Mathematics, University of Central Florida 2014
B.S., Mathematics, Penn State Erie 2011

Citizenship

United States of America

Research Interests

Integrable systems, Riemann–Hilbert problems, asymptotic analysis

Papers

In preparation

- D. Bilman, E. Blackstone, P. D. Miller, and G. Young, The robust inverse scattering transform for the modified Korteweg-de Vries equation and rogue waves of infinite order.
- E. Blackstone, C. Charlier, and J. Lenells, Toeplitz determinants with a one-cut regular potential and Fisher–Hartwig singularities II.

Submitted

- E. Blackstone, L. Gassot, P. Gérard, and P. D. Miller, The Benjamin-Ono equation in the zero-dispersion limit for rational initial data: generation of dispersive shock waves. https://arxiv.org/abs/2410.17405
- E. Blackstone, P. D. Miller, and M. Mitchell, Universality in the Small-Dispersion Limit of the Benjamin-Ono Equation. https://arxiv.org/abs/2410.21581

Published

1) E. Blackstone, L. Gassot, P. Gérard, and P. D. Miller, The Benjamin-Ono Initial-Value Problem for Rational Data with Application to Long-Time Asymptotics and Scattering. *Ann. Inst. H. Poincaré C Anal. Non Linéaire* (2025).
2) E. Blackstone, L. Gassot, and P. D. Miller, On strong zero-dispersion asymptotics for Benjamin-Ono soliton ensembles. *Contemp. Math.* **823** (2025), 213–270.

3) E. Blackstone, C. Charlier, and J. Lenells, Toeplitz determinants with a one-cut regular potential and Fisher–Hartwig singularities I. Equilibrium measure supported on the unit circle. *Proc. Roy. Soc. Edinburgh Sect. A* **154** (2024), 1431–1472.

4) M. Bertola, E. Blackstone, A. Katsevich, and A. Tovbis, On singular limits of finite Hilbert transform operators on multi intervals. *Math. Nachr.* **00** (2023), 1–42.

5) E. Blackstone, C. Charlier, and J. Lenells, The Bessel kernel determinant on large intervals and Birkhoff's ergodic theorem. *Comm. Pure Appl. Math.* **76** (2023), 3300–3345.

6) E. Blackstone, C. Charlier, and J. Lenells, Gap probabilities in the bulk of the Airy process. *Random Matrices Theory Appl.* **11**, (2022).

7) E. Blackstone, C. Charlier, and J. Lenells, Oscillatory asymptotics for the Airy kernel determinant on two intervals. *Int. Math. Res. Not.* **2022** (2022), 2636–2687.

8) M. Bertola, E. Blackstone, A. Katsevich, and A. Tovbis, Diagonalization of the finite Hilbert transform on two adjacent intervals: the Riemann-Hilbert approach. *Anal. Math. Phys.* **10** (2020).

9) E. Blackstone, Spectral properties of the finite Hilbert transform on two adjacent intervals via the method of Riemann–Hilbert problem. *Electronic Theses and Dissertations* (2019). https://stars.library.ucf.edu/etd/6454

10) E. Blackstone and D.J. Galiffa, Two Differential Equations for the Linear Generating Function of the Charlier Polynomials. *Appl. Math. E-Notes* **13** (2013), 60–67.

Selected Talks

- Strong zero dispersion asymptotics for the Benjamin-Ono equation with rational initial data, Joint Mathematics Meeting in Seattle, January 2025.
- Zero-Dispersion Asymptotics for Benjamin-Ono Soliton Ensembles, SIAM Conference on Nonlinear Waves and Coherent Structures in Baltimore, June 2024.
- Small dispersion asymptotics of Benjamin-Ono soliton ensembles, Applied and interdisciplinary math seminar at University of Michigan, February 2024.
- Spectral theory of finite Hilbert transforms acting on many intervals, Geometry and analysis seminar at UC Santa Cruz, December 2023.
- Large gap asymptotics for the Bessel kernel determinant, Midwestern Workshop on Asymptotic Analysis at IUPUI, October 2023.

- The spectral theory of finite Hilbert transforms acting on many intervals, Integrable systems and random matrix theory seminar at University of Michigan, January 2023.
- The zero-dispersion limit of the Benjamin-Ono equation, IMACS Conference on Nonlinear Evolution Equations at University of Georgia, April 2022.
- An introduction to Riemann–Hilbert problems with applications to large gap asymptotics, Seminar at Penn State Erie, October 2021.
- Large gap asymptotics for Airy and Bessel kernel determinants, Integrable systems and random matrix theory seminar at University of Michigan, February 2021.
- Spectral properties of the finite Hilbert transform on two adjacent intervals via the method of Riemann-Hilbert problem, Analysis seminar at KU Leuven, December 2019.
- Singular limits of certain Hilbert-Schmidt integral operators and applications to tomography, IMACS Conference on Nonlinear Evolution Equations at University of Georgia, April 2019.
- Deift-Zhou Method for the Asymptotics of Operators with an Integrable Kernel: Transition from Discrete to Continuous Spectrum, AMS Spring Southeastern Sectional Meeting at College of Charleston, March 2017.
- Riemann-Hilbert Problems and Finite Hilbert Transforms with Applications to Tomography, University of Central Florida Analysis Seminar, November 2016.
- Generating Functions for the Charlier Orthogonal Polynomial Sequence, MAA Allegheny Mountain Sectional Meeting at West Virginia University, April 2012.

Service

Referee for: Advances in Nonlinear Analysis, Communications in Mathematical Physics, Hong Kong Research Grants Council, SIAM Journal on Mathematical Analysis, Studies in Applied Mathematics

Co-organizer of: Integrable systems and random matrix theory seminar at the University of Michigan (https://sites.google.com/umich.edu/isrmt-seminar/), New Results in Integrable Nonlocal Wave Models minisymposium at the SIAM Conference on Nonlinear Waves and Coherent Structures (June 2024).

Awards

UofM Honored Instructor (2025), UofM postdoctoral travel funds $3500 (2021-2025), James Van Loo postdoctoral fellow (reduced teaching load, 2021-2024), UCF mathematics department outstanding dissertation award (2019)

Undergraduate research projects

1) Haoyan Shi - Soliton solutions of the KdV equation, summer 2023

2) Mutian Shen - A 'simple' linear algebra problem arising from the Benjamin–Ono equation N-soliton solution, summer 2023

Teaching
University of Michigan

- Winter 2025 - Math 316 Differential equations (two sections)
- Fall 2024 - Math 116 Calculus II (two sections)
- Summer 2024 - Math 216 Introduction to differential equations
- Fall 2023 - Math 286 Honors differential equations, Math 316 Differential equations
- Spring 2023 - Math 216 Introduction to differential equations
- Fall 2022 - Math 286 Honors differential equations
- Spring 2022 - Math 316 Differential equations
- Winter 2022 - Math 316 Differential equations
- Fall 2021 - Math 156 Applied honors calculus II

University of Central Florida

- Spring 2019 - MAC2312 Calculus with analytic geometry II
- Fall 2018 - MAC2312 Calculus with analytic geometry II (two sections)
- Spring 2018 - MAS3105 Matrix and Linear Algebra
- Fall 2017 - MAS3105 Matrix and Linear Algebra
- Summer 2017 - Bootcamp to prepare local community college math instructors to begin a certification program in the coming fall semester
- Fall 2016 - MAP2302 Ordinary Differential Equations I (teaching assistant)
- Summer 2016 - MAC2311 Calculus with analytic geometry I (international student section)
- Summer 2015 - MAC2313 Calculus with analytic geometry III
- Fall 2013 to Spring 2016 - MAC2311 Calculus with analytic geometry I (teaching assistant)

- Spring 2013 - Mathematics Assistance and Learning Lab
- Fall 2012 - Mathematics Assistance and Learning Lab

References

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Alexander Tovbis
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Gavin LaRose (concerning teaching)
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Contact Information

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