Kyle Liss

CONTACT INFORMATION

Department of Mathematics
University of South Carolina
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APPOINTMENTS

University of South Carolina

Assistant Professor (August 2025 - Present)

Duke University

Phillip Griffiths Assistant Research Professor (January 2022 - June 2025)

Institute for Computational and Experimental Research in Mathematics, Brown University

Postdoctoral Researcher (September 2021 - December 2021)

RESEARCH INTERESTS

Analysis of stochastic systems and partial differential equations arising in fluid mechanics – mixing and enhanced dissipation, stochastically forced models of turbulence, hydrodynamic stability

EDUCATION

Department of Mathematics, University of Maryland – College Park

Ph.D. in Mathematics, June 2021

Advisor: Jacob Bedrossian

Dickinson College

B.A. in Mathematics and Physics, May 2016

- Departmental Honors in Physics
- Summa Cum Laude

PUBLICATIONS

T. Elgindi, K. Liss, & J. Mattingly, *Optimal enhanced dissipation and mixing for a time-periodic, Lipschitz velocity field on* $\mathbb{T}^2$, Duke Mathematical Journal **147** (2025), 1209-1260

T. Elgindi & K. Liss, *Norm growth, non-uniqueness, and anomalous dissipation in passive scalars*, Archive for Rational Mechanics and Analysis **248** (2024)

J. Bedrossian & K. Liss, *Stationary measures for stochastic differential equations with degenerate damping*, Probability Theory and Related Fields **189** (2024), 101-178

J. Bedrossian & K. Liss, *Quantitative spectral gaps for hypoelliptic stochastic differential equations with small noise*, Probability and Mathematical Physics **2** (2021), 477-532

K. Liss, *On the Sobolev stability threshold of 3D Couette flow in a uniform magnetic field,* Communications in Mathematical Physics **377** (2020), 859–908

PREPRINTS

S. Elesaely, D. Herzog, & K. Liss, *Quantitative positivity of transition densities for random perturbations of Hamiltonian systems*, arXiv:2509.02448 (2025)

V. Gardner, K. Liss, & J. Mattingly, *A pathwise approach to the enhanced dissipation of passive scalars advected by shear flows*, arXiv:2410.05657 (2024)

J. Bedrossian, A. Blumenthal, K. Callis & K. Liss, *Existence of stationary measures for partially damped SDEs with generic, Euler-type nonlinearities*, arXiv:2407.16592 (2024)

Mentorship of student research

Informally advised Victor Gardner (Duke graduate student) on research in stochastic analysis and enhanced dissipation, Spring 2023–Fall 2024

Supervised undergraduate honors thesis of Owen Huber (Duke undergraduate) on project in ODEs, Fall 2023–Spring 2024

Led an REU in fluid mechanics and PDEs at Duke University, Spring 2023

Professional Service

Co-organizer of AMS special session Recent advances at the interface of dynamics and fluids, Tulane University, Fall 2025

Co-organizer of Applied Math and Analysis Seminar, Duke University, Fall 2023–Spring 2024

Co-organizer of AMS special session on Stochastic methods in fluid mechanics, Howard University, Spring 2024

Teaching Experience

Fall	2025	Instructor, Analysis I
Fall	2025	Instructor, Vector Calculus
Spring	2025	Instructor, Laboratory Calculus I
Fall	2024	Instructor, Real Analysis I
Spring	2024	Instructor, Calculus III
Fall	2023	Instructor, Calculus III
Spring	2023	Instructor, Real Analysis I
Fall	2022	Instructor, Calculus III
Spring	2021	Co-instructor, Topics in Partial Differential Equations
Fall	2020	Instructor, Calculus II
Fall	2019	Instructor, Mathematical Modeling and Probability
Spring	2019	Grader, Graduate PDE II
Spring	2019	Grader, Advanced Calculus I
Fall	2018	Teaching Assistant, Calculus III
Spring	2018	Teaching Assistant, Calculus I
Fall	2017	Teaching Assistant, Calculus III
Spring	2017	Teaching Assistant, Ordinary Differential Equations
Fall	2016	Teaching Assistant, Calculus II

Invited Talks

Invariant measures for partially damped SDEs motivated by fluid mechanics, AMS special session, Tulane University (October 2025)

Batchelor's spectrum for a deterministically forced passive scalar, Workshop on Long-time dynamics in random and deterministic systems, EPFL (September 2025)

Existence of invariant measures for SDEs with generic, fluid-like nonlinearities,Workshop on Random Dynamical Systems, PDEs, and Stochastic Analysis, University of Mary-

land (July 2025)

Existence of invariant measures for SDEs with generic, fluid-like nonlinearities, SIAM Conference on Applications of Dynamical Systems in Denver, Colorado (May 2025)

Invariant measures for partially damped SDEs motivated by fluid mechanics, Stochastics and Discrete Analysis Seminar, North Carolina State University (February 2025)

Invariant measures for partially damped SDEs motivated by fluid mechanics, PDE Seminar, University of Nebraska–Lincoln (February 2025)

Small scale formation in stochastic fluid mechanics and passive scalar transport, Departmental Colloquium, Indiana University Bloomington (December 2024)

Long-time behavior of stochastic fluid models and passive scalars advected by incompressible flows, Departmental Colloquium, University of South Carolina (December 2024)

Invariant measures for fluid-like SDEs with generic nonlinearities, Applied and Computational Mathematics Seminar, Tulane University (November 2024)

Invariant measures for partially damped SDEs with generic, Euler-type nonlinearities, Analysis and Probability Seminar, Iowa State University (November 2024)

Enhanced diffusion for time-periodic alternating shear flows, CDSNS Colloquium, Georgia Tech (March 2024)

Enhanced diffusion for alternating shear flows, Analysis Seminar, Courant Institute (February 2024)

Enhanced dissipation for alternating shear flows, Zu Chongzhi Mathematics Research Seminar, Duke Kunshan University (November 2023)

Enhanced and anomalous dissipation for alternating shear flows, PDE and Applied Math Seminar, UC Davis (November 2023)

Enhanced dissipation for time-periodic alternating shear flows, Summer School: Fluid Dynamics, UMD (July 2023)

Enhanced dissipation for time-periodic alternating shear flows, Summer School: Deterministic and random features of fluids, EPFL (July 2023)

Enhanced dissipation for time-periodic alternating shear flows, One-day meeting on Ergodic Theory for Complex Systems, Courant Institute (May 2023)

Enhanced dissipation for time-periodic alternating shear flows, Seminar on Analysis of Fluids and Related Topics, Princeton (April 2023)

Enhanced dissipation for time-periodic alternating shear flows, AMS special session, University of Cincinnati (April 2023)

Enhanced dissipation for time-periodic alternating shear flows, AMS special session, Georgia Tech (March 2023)

Quantitative convergence to equilibrium and some partial dissipation results for Euler-like SDE, SCGP workshop at Stony Brook University: Small scale dynamics in fluid motion (June 2022)

Existence of invariant measures for some degenerately damped SDEs, CRM Workshop: Unifying concepts in PDEs with randomness (May 2022)

Quantitative hypoellipticity and exponential convergence to equilibrium for a class of SDEs, Probability, Analysis, and Data Science Seminar, Iowa State University (March 2021)

Quantitative convergence to equilibrium for a class of hypoelliptic SDEs, Applied Analysis Seminar, Max Planck Institute (December 2020)

Honors and Awards

2019	Monroe H. Martin Graduate Research Fellowship (UMD)
2019	Aziz Osborn Gold Medal in Teaching Excellence (UMD)
2016	James Fowler Rusling Prize for Scholarly Achievement (Dickinson College)
2016	Lance E. Kohlhaas Memorial Prize in Mathematics (Dickinson College)
2015	Forrest E. Craver Memorial Prize in Mathematics (Dickinson College)
2014	Caroline Hatton Clark Mathematics Scholarship (Dickinson College)
2013	William W. Landis Memorial Prize in Mathematics (Dickinson College)