# KEEFER ROWAN

Courant Institute, NYU Mathematics WWH 708

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## ACADEMIC INTERESTS

Mathematical physics, partial differential equations, turbulence, mixing

## Employment

#### École Polytechnique Fédérale de Lausanne

- Postdoctoral researcher (September 2025–)
- Supervisor: Martin Hairer

## EDUCATION

#### Courant Institute, NYU

- Ph.D., Mathematics (May 2025).
- Advisors: Vlad Vicol and Scott Armstrong.

## Vanderbilt University

• B.A., Mathematics, Physics, Summa cum laude (May 2020).

## Preprints

- 5. A subsequentially fast dynamo on  $\mathbb{T}^3$ . Preprint. (2025, arXiv)
- 4. **Divergence-free drifts decrease concentration** (joint with Elias Hess-Childs, Renaud Raquépas). Preprint. (2025, arXiv)
- 3. Fourier mass lower bounds for Batchelor-regime passive scalars (joint with William Cooperman). Preprint. (2025, arXiv)
- 2. A universal total anomalous dissipator (joint with Elias Hess-Childs). Preprint. (2025, arXiv)
- 1. Exponential scalar mixing for the 2D Navier–Stokes equations with degenerate stochastic forcing (joint with William Cooperman). Preprint. (2024, arXiv)

## PUBLICATIONS

- 7. Higher-order propagation of chaos in  $L^2$  for interacting diffusions (joint with Elias Hess-Childs). (2025, Probability and Mathematical Physics).
- 6. Accelerated relaxation enhancing flows cause total dissipation. (2024, Nonlinearity).

 $<sup>^1\</sup>mathrm{Updated}$  June 2, 2025

- 5. On anomalous diffusion in the Kraichnan model and colored-in-time variants. (2024, Archive for Rational Mechanics and Analysis).
- 4. The No Free Lunch Theorem, Kolmogorov Complexity, and the Role of Inductive Biases in Machine Learning (joint with Micah Goldblum, Marc Finzi, Andrew Gordon Wilson). (2024, ICML 2024).
- 3. Simulation of a hydrogen atom in laser field using the time-dependent variational principle (joint with L. Schatzki, T. Zaklama, Y. Suzuki, K. Watanabe, and K. Varga). (2020, *Physical Review E*).
- 2. Matrix Elements of One Dimensional Explicitly Correlated Gaussian Basis Functions (joint with L. Schatzki, Y. Suzuki, K. Varga, T. Zaklama, and D. Zhang). (2020, *Few-Body Systems*).
- 1. Measurement and modeling of electron-cloud-induced betatron tune shifts at the Cornell Electron-Positron Storage Ring test accelerator (joint with S. Poprocki, S. W. Buechele, J. A. Crittenden, D. L. Rubin, J. E. San Soucie). (2019, *Physical Review Accelerators and Beams*).

## INVITED TALKS

- 6. Fourier mass lower bounds for Batchelor-regime passive scalars. Minisymposium on Taming PDE with Randomness, SIAM DS25, May 2025.
- 5. Exponential scalar mixing for the 2D Navier–Stokes equations with degenerate stochastic forcing. Clifford Lectures, Tulane University, February 2025.
- 4. Exponential scalar mixing for the 2D Navier–Stokes equations with degenerate stochastic forcing. Analysis Seminar, Stony Brook University, January 2025.
- 3. Exponential scalar mixing for the 2D Navier–Stokes equations with degenerate stochastic forcing. Center for Nonlinear Analysis Seminar, Carnegie Mellon University, November 2024.
- 2. Exponential scalar mixing for the 2D Navier–Stokes equations with degenerate stochastic forcing. Applied and Computational Math Seminar, Tulane University, October 2024.
- 1. On anomalous diffusion in the Kraichnan model and colored-in-time variants. Analysis Seminar, Courant Institute, NYU, November 2023.

#### TEACHING EXPERIENCE

#### New York University

- Teaching Assistant, Honors Analysis II (Spring 2024).
- Teaching Assistant, Honors Analysis I (Fall 2023).
- Teaching Assistant, Analysis (two sections, Spring 2023).
- Teaching Assistant, Linear Algebra (two sections, Fall 2022).
- Grader, Topology (Spring 2021).

#### ORGANIZATION

- Renormalization reading group, Organizer, Courant Institute, 2024
- Rough paths theory reading group, Organizer, Courant Institute, 2024
- Current topics in mathematical fluids seminar, Organizer, Courant Institute, 2023-2024
- Courant Student Organization, President, 2022-2023
- Distribution theory reading group, Organizer, Courant Institute, 2021

## AWARDS

- Isaac Barkey and Ernesto Yhap Fellowship, Courant Institute (2023).
- Harold Grad Memorial Prize, Courant Institute (2022).
- Newton Underwood Award, Vanderbilt University (2020).
- Richard J. Larsen Award, Vanderbilt University (2020).