

KEEFER ROWAN

EPFL
Mathematics
MA B2 487

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MATHEMATICAL INTERESTS

Mathematical physics, partial differential equations, turbulence, mixing, stochastic differential equations in low regularity

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

6. **Effective Lagrangian regularity and the uniqueness threshold for random Hölder velocity fields** (joint with Maria Colombo and Elias Hess-Childs). (2026, [arXiv](#)).
5. **Sharp pathwise nonuniqueness for additive SDEs** (joint with Elias Hess-Childs). (2026, [arXiv](#)).
4. **The Obukhov–Corrsin spectrum of passive scalar turbulence through anomalous regularization.** (2025, [arXiv](#)).
3. **Turbulent and intermittent phenomena in a universal total anomalous dissipator** (joint with Elias Hess-Childs). (2025, [arXiv](#)).
2. **Exponentially mixing flows with slow enhanced dissipation** (joint with William Cooperman, Gautam Iyer, Seungjae Sun). (2025, [arXiv](#)).
1. **A subsequentially fast dynamo on $\mathbb{T}^3$.** (2025, [arXiv](#)).

¹Updated August 26, 2026

PUBLICATIONS

12. **A universal total anomalous dissipator** (joint with Elias Hess-Childs). (2026, Accepted to Communications in Mathematical Physics).
11. **Superexponential dissipation enhancement on $\mathbb{T}^d$** . (2026, [Nonlinearity](#)).
10. **Divergence-free drifts decrease concentration** (joint with Elias Hess-Childs, Renaud Raquépas). (2026, [Journal of Functional Analysis](#)).
9. **Fourier mass lower bounds for Batchelor-regime passive scalars** (joint with William Cooperman). (2025, [Communications in Pure and Applied Mathematics](#)).
8. **Exponential scalar mixing for the 2D Navier–Stokes equations with degenerate stochastic forcing** (joint with William Cooperman). (2025, [Inventiones mathematicae](#)).
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](#)).
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

15. *The Obukhov–Corrsin spectrum of passive scalar turbulence through anomalous regularization*. Basel–Zürich Seminar in Analysis, University of Basel, May 2026.
14. *Sharp pathwise nonuniqueness for additive SDEs*. Berlin Probability Colloquium, TU Berlin, May 2026.
13. *Sharp pathwise nonuniqueness for additive SDEs*. Analysis & PDE Semina, Gran Sasso Science Institute, May 2026.
12. *The Obukhov–Corrsin spectrum of passive scalar turbulence through anomalous regularization*. Seminar in Probability and PDE, Sorbonne Université, March 2026.
11. *Superexponential dissipation enhancement on $\mathbb{T}^d$* . Applied Math and Analysis Seminar, Duke University, February 2026.
10. *The Obukhov–Corrsin spectrum of passive scalar turbulence through anomalous regularization*. Turbulence and Mixing in Fluid Dynamics Workshop, SwissMAP Les Diablerets, January 2026.
9. *Superexponential dissipation enhancement on $\mathbb{T}^d$* . Applied PDE Seminar, Imperial College London, November 2025.

8. *Superexponential dissipation enhancement on $\mathbb{T}^d$* . Analysis Seminar, Bielefeld University, November 2025.
7. *Superexponential dissipation enhancement on $\mathbb{T}^d$* . Long-time Dynamics in Random and Deterministic Systems Workshop, Bernoulli Center, EPFL, September 2025.
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

EPFL

- Lecturer, Graduate Stochastic Calculus (Fall 2026)
- Teaching Assistant, Probability (Fall 2025)

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).

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).