Jacob Bedrossian **Curriculum Vitae**

CONTACT INFORMATION

University of California, Los Angeles
Department of Mathematics
http://www.math.ucla.edu/ jacob
Mathematics Building
Los Angeles, CA 90095 USA

Cell: (440) 554-6984
E-mail: jacob@math.ucla.edu

ACADEMIC POSITIONS AND EDUCATION

- Professor and David Saxon Presidential Term Chair, University of California, Los Angeles. 2023–
- Professor. University of Maryland, College Park. 2019–2023
- Associate Professor. University of Maryland, College Park. 2017-2019.
- Assistant Professor. University of Maryland, College Park. 2014-2017.
- NSF post-doc. Courant Institute, New York University. 2011-2014.
- Ph.D. Mathematics; University of California-Los Angeles. 2011. (Advisors: Andrea Bertozzi and Joseph Teran)
- M.S./B.S.. Applied mathematics; Case Western Reserve University. 2007.

AWARDS, FELLOWSHIPS, AND GRANTS:

- NSF DMS Applied Mathematics Grant (DMS-2510949) 2025-2027 (National Science Foundation)
- 2022 Invited speaker at the ICM (International Congress of Mathematics).
- 2022 Nachdiplom lecturer at ETH Zürich, Switzerland.
- NSF DMS Applied Mathematics Grant (DMS-2108633), 2021-2025. (National Science Foundation)
- 2020 Simons Fellow in Mathematics (Simons Foundation)
- 2020 Peter Lax Award (18th International Conference on Hyperbolic problems).
- 2019 IMA Prize (Institute for Mathematics and its Applications)
- 2019 SIAG/APDE prize joint with N. Masmoudi (Society for Industrial and Applied Mathematics).
- NSF CAREER Grant (DMS-1552826), 2016-2021. (National Science Foundation)
- 2015 Alfred P. Sloan Research Fellow in Mathematics (by the Sloan Foundation).
- NSF DMS Applied Mathematics Grant (DMS-1413177), 2014-2017. (National Science Foundation)
- Cathleen Morawetz Postdoctoral Fellowship, 2013-2014 (by the Courant Institute, NYU).
- NSF Mathematical Sciences Postdoctoral Research Fellowship (DMS-1103765), 2011-2014

Other recognition

- Joint work with A. Blumenthal and S. Punshon-Smith featured in SIAM News. October 2021.
- Joint work with P. Germain and N. Masmoudi was emphasized in N. Masmoudi's 2017 Fermat Prize announcement.
- 2014 Bourbaki Seminar on our joint work with N. Masmoudi; given by David Gérard-Varet. 2014.

PUBLICATIONS

Preprints

1. Bedrossian, Jacob, Jiajie Chen, Maria Pia Gualdani, Sehyun Ji, Vlad Vicol, and Jincheng Yang. "Finite time singularities in the Landau equation with very hard

potentials." arXiv preprint arXiv:2602.05981 (2026).

2. Bedrossian, Jacob, Patrick Flynn, and Sameer Iyer. "Linear decay of the beta-plane equation near Couette flow on the plane." arXiv preprint arXiv:2511.00667 (2025).

3. Bedrossian, Jacob, Siming He, Sameer Iyer, Linfeng Li, and Fei Wang. "Stability threshold of close-to-Couette shear flows with no-slip boundary conditions in 2D." arXiv preprint arXiv:2510.16378 (2025).

4. J. Bedrossian, W. Zhao, and R. Zi. "Landau damping and the long-time collisionless limit of the Vlasov-Poisson-Landau Equation." *arXiv:2508.17420* (2025).

5. J. Bedrossian, A. Blumenthal, S. Punshon-Smith "Non-uniqueness of stationary measures for stochastic systems with almost surely invariant manifolds." *arXiv:2505.22903.* (2025).

6. J. Bedrossian, P. Flynn, S. Punshon-Smith "Negative regularity mixing for random volume preserving diffeomorphisms." *arXiv:2410.19251.* (2025).

7. 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).

8. J. Bedrossian, C.-H. Wu. "A quantitative dichotomy for Lyapunov exponents of non-dissipative SDEs with an application to electrodynamics." *arXiv:2406.00220* (2024).

9. J. Bedrossian, S. He, S. Iyer, F. Wang. "Uniform Inviscid Damping and Inviscid Limit of the 2D Navier-Stokes equation with Navier Boundary Conditions." *arXiv:2405.19249* (2024).

10. J. Bedrossian, S. Papathanasiou. "The Vlasov-Poisson and Vlasov-Poisson-Fokker-Planck systems in stochastic electromagnetic fields: local well-posedness." *arXiv:2211.03336* (2022).

Accepted

1. Arbon, Ryan, and Jacob Bedrossian. "Stability of Stochastically Driven Couette Flow in 2D with Navier Boundary Conditions at High Reynolds Number via Averaging Principle." Archive for Rational Mechanics and Analysis 250.3 (2026): 31.

2. Albritton, Dallas, Jacob Bedrossian, and Matthew Novack. "Kinetic shock profiles for the Landau equation." Ars Inveniendi Analytica (2026).

3. J. Bedrossian and M. Latocca. Non-invariance of Gaussian Measures under the 2D Euler Flow." *to appear in Annales de l'Institut Henri Poincaré C, (arXiv:2307.04214)* (2023).

4. J. Bedrossian, S. He, S. Iyer, F. Wang. "Pseudo-Gevrey Smoothing for the Passive Scalar Equations near Couette." *Journal of Functional Analysis* (2024).

5. R. Arbon, J. Bedrossian. "Quantitative Hydrodynamic Stability for Couette Flow on Unbounded Domains with Navier Boundary Conditions." *Communications in Mathematical Physics* (2024).

6. J. Bedrossian, W. Zhao, R. Zi. "Landau damping, collisionless limit, and stability threshold for the Vlasov-Poisson equation with nonlinear Fokker-Planck collisions." *Communications in Mathematical Physics* (2024).

7. J. Bedrossian, S. He, S. Iyer, F. Wang. "Stability threshold of nearly-Couette shear flows with Navier boundary conditions in 2D." *Communications in Mathematical Physics* (2023).

8. J. Bedrossian, M. Coti Zelati, M. Dolce. "Taylor dispersion and phase mixing in the non-cutoff Boltzmann equation on the whole space." *Proceedings of the London Mathematical Society* 129.1 (2024).

9. J. Bedrossian, S. Punshon-Smith. "Chaos in stochastic 2d Galerkin-Navier-Stokes". *Communications in Mathematical Physics* 405.4 (2024).

10. J. Bedrossian. "A note on cascade flux laws for the stochastically-driven nonlinear Schrodinger equation." *Nonlinearity* (2024).

11. J. Bedrossian, K. Liss "Stationary measures for stochastic differential equations with degenerate damping". *Prob. Theory and Related Fields.* 2023.

12. J. Bedrossian, R. Bianchini, M. Coti Zelati, M. Dolce. "Nonlinear inviscid damping and shear-buoyancy instability in the two-dimensional Boussinesq equations." *Comm. Pure Appl. Math.* 2023.

13. S. Krishnagopal, J. Bedrossian."Encoded Prior Sliced Wasserstein AutoEncoder for learning latent manifold representations." *Inter. Joint Conf. on Neural Networks* 2022.

14. J. Bedrossian, N. Masmoudi, C. Mouhot. "Linearized wave-damping structure of Vlasov-Poisson in R^3." To appear in *Siam J. of Math. Anal.* 2020.

15. J. Bedrossian, M. Gualdani, S. Snelson. "Non-existence of some approximately self-similar singularities for the Landau, Vlasov-Poisson-Landau, and Boltzmann equations. " To appear in *Trans. Amer. Math. Soc.*. 2021

16. J. Bedrossian, A. Blumenthal, S. Punshon-Smith. "A regularity method for lower bounds on the Lyapunov exponent for stochastic differential equations." To appear in *Invent. Math.*. 2020.

17. J. Bedrossian, P. Germain, B. Harrop-Griffiths. "Vortex filament solutions of the Navier-Stokes equations." To appear in *Comm. Pure Appl. Math.* 2018.

18. J. Bedrossian, A. Blumenthal, S. Punshon-Smith. "Lagrangian chaos and scalar advection in stochastic fluid mechanics." To appear in *J. Euro. Math. Soc.*. 2018.

19. J. Bedrossian, A. Blumenthal, S. Punshon-Smith. "Almost-sure exponential mixing of passive scalars by the stochastic Navier-Stokes equations." To appear in *Annals of Probability.* 2019.

20. J. Bedrossian, K. Liss. "Quantitative spectral gaps and uniform lower bounds in the small noise limit for Markov semigroups generated by hypoelliptic stochastic differential equations." To appear in *Prob. Math. Phys.* 2020.

21. J. Bedrossian, A. Blumenthal, S. Punshon-Smith. "The Batchelor spectrum of passive scalar turbulence in stochastic fluid mechanics." To appear in *Comm. Pure. Appl. Math.* 2019

22. J. Bedrossian, W. Golding. "Uniqueness Criteria for the Oseen Vortex in the 3d Navier-Stokes Equations." To appear in *Comm. Part. Diff. Eqns.* 2020.

23. J. Bedrossian, A. Blumenthal, S. Punshon-Smith. Almost-sure enhanced dissipation and uniform-in-diffusivity exponential mixing for advection-diffusion by stochastic Navier-Stokes. To appear in *Prob. Theory and Related Fields.* 2019

24. J. Bedrossian, S. He. Inviscid damping and enhanced dissipation of the boundary layer for 2D Navier-Stokes linearized around Couette flow in a channel. To appear in *Comm. Math. Phys.*. 2019.

25. J. Bedrossian, M. Coti Zelati, S. Punshon-Smith, F. Weber. Sufficient conditions for dual cascade flux laws in the stochastic 2d Navier-Stokes equations. To appear in *Arch. Rat. Mech. Anal.*. 2019.

26. J. Bedrossian. Nonlinear echoes and Landau damping with insufficient regularity. To appear in *Tunis. J. Math.*, 2016.

27. J. Bedrossian, F. Wang. "The Linearized Vlasov and Vlasov–Fokker–Planck Equations in a Uniform Magnetic Field." Journal of Statistical Physics 178.2 (2020): 552-594.

28. J. Bedrossian, M. Coti Zelati, S. Punshon-Smith, F. Weber. A sufficient condition for the Kolmogorov 4/5 law for stationary martingale solutions to the 3D Navier-Stokes equations. *Comm. Math. Phys.*, 367(3), pp.1045–1075. 2019.

29. J. Bedrossian, M. Coti Zelati, V. Vicol. Vortex axisymmetrization, inviscid damping, and vorticity depletion in the linearized 2D Euler equations. *Annals of PDE*, 5(1), pp 4. 2019.

30. J. Bedrossian, P. Germain, N. Masmoudi. Dynamics near the subcritical transition of the 3D Couette flow II: Above threshold case. To appear in *Mem. of the Amer. Math. Soc.*, 2015.

31. J. Bedrossian, P. Germain, N. Masmoudi. Dynamics near the subcritical transition of the 3D Couette flow I: Below threshold case. To appear in *Mem. of the Amer. Math. Soc.*, 2015.

32. J. Bedrossian, N. Masmoudi, C. Mouhot. Landau damping in finite regularity for unconfined systems with screened interactions. *Comm. Pure Appl. Math.*, 71(3), pp.537-576. 2018.

33. J. Bedrossian. Suppression of plasma echoes and Landau damping in Sobolev spaces by weak collisions in a Vlasov-Fokker-Planck equation. *Annals of PDE* 3(2), 2017.

34. J. Bedrossian, S. He. Suppression of blow-up in Patlak-Keller-Segel via shear flows. *SIAM J. of Math. Anal.*, 49(6), pp.4722-4766. 2017.

35. J. Bedrossian, P. Germain, N. Masmoudi. On the stability threshold for the 3D Couette flow in Sobolev regularity. *Annals of Math.*, 185(2):541-608, 2017.

36. J. Bedrossian, M. Coti Zelati. Enhanced dissipation, hypoellipticity, and anomalous small noise inviscid limits in shear flows. *Arch. Rat. Mech. Anal.*, 224(3), pp.1161-1204. 2017.

37. J. Bedrossian, M. Coti Zelati, N. Glatt-Holtz. Invariant measures for passive scalars in the small noise inviscid limit. *Comm. Math. Phys.*, 348(1):101-127, 2016.

38. J. Bedrossian, V. Vicol, F. Wang. The Sobolev stability threshold for 2D shear flows near Couette. *J. Nonlin. Sci.*, 1-25, 2016.

39. J. Bedrossian, N. Masmoudi, C. Mouhot. Landau damping: paraproducts and Gevrey regularity. *Annals of PDE*, 2(1):1-71, 2016.

40. J. Bedrossian, N. Masmoudi, V. Vicol. Enhanced dissipation and inviscid damping in the inviscid limit of the Navier-Stokes equations near the 2D Couette flow. *Arch. Rat. Mech. and Anal.*, 219(3):1087–1159, 2016.

41. J. Bedrossian. Large mass global solutions for a class of L1-critical non-local aggregation equations and parabolic-elliptic Patlak-Keller-Segel models. *Comm. Partial Diff. Eqns.*, 40(6):1119-1136, 2015.

42. J. Bedrossian, N. Masmoudi. Inviscid damping and the asymptotic stability of planar shear flows in the 2D Euler equations. *Publ. Math. de l'IHÉS* 122.1:195-300, 2015.

43. J. Bedrossian, R.V. Kohn. Blister patterns and energy minimization in compressed thin films on compliant substrates. *Comm. Pure Appl. Math.*. 68(3):472–510, 2015.

44. J. Bedrossian, N. Masmoudi. Existence, Uniqueness and Lipschitz Dependence for Patlak-Keller-Segel and Navier-Stokes in R2 with Measure-valued initial data. *Arch. Rat. Mech. Anal.*. 214 (3): 717–801, 2014.

45. J. Azzam, J. Bedrossian. Bounded mean oscillation and the uniqueness of active scalar equations. *Trans. Amer. Math. Soc.*. 367(5):3095–3118, 2015.

46. J. Bedrossian, N. Rodríguez. Inhomogeneous Patlak-Keller-Segel Models and aggregation equations with nonlinear diffusion in Rd. *Disc. Cont. Dyn. Sys. B.* 19(5):1279-1309, 2014.

47. J. Bedrossian, I. Kim. Global existence and finite time blow-up for critical Patlak-Keller-Segel models with inhomogeneous diffusion. *SIAM J. Math. Anal.*, 45(3):934–964, 2013.

48. J. Bedrossian. Intermediate asymptotics for critical and supercritical aggregation equations and Patlak-Keller-Segel models. *Comm. Math. Sci.*, 9(4):1143-1161, 2011.

49. J. Bedrossian. Global minimizers for free energies of subcritical aggregation equations with degenerate diffusion. *Appl. Math, Letters*, 24(11):1927-1932, 2011

50. J. Bedrossian, N. Rodríguez., and A.L. Bertozzi. Local and Global Well-Posedness for Aggregation Equations and Patlak-Keller-Segel Models with Degenerate Diffusion. *Nonlinearity*, 24(6):1683–1714, 2011.

51. J. Bedrossian, J.H. von Brecht, S. Zhu, E. Sifakis and J. Teran. A virtual node method for Poisson interface problems in irregular domains. *J. Comput. Phys.*, Vol. 229, No. 18, pg 6405-6526 (2010)

52. C. Geuzaine, J. Bedrossian and X. Antoine, An amplitude formulation to reduce the pollution error in the finite element solution of time-harmonic scattering problems, *IEEE Trans. on Magnetics*, Vol. 44, No. 4 (2008)

Expository papers

1. J. Bedrossian. A brief introduction to the mathematics of Landau damping. *aXiv:2211.13707.* 2022.

2. J. Bedrossian, A. Blumenthal, S. Punshon-Smith. Lower bounds on the Lyapunov exponents of stochastic differential equations. *Proc of the ICM 2022.*.

3. J. Bedrossian, P. Germain, N. Masmoudi. Stability of the Couette flow at high Reynolds number in 2D and 3D. *Bull. of the AMS.*, 56(3), pp 373–414. 2019.

4. J. Bedrossian, Y. Deng, N. Masmoudi. The Orr mechanism: stability/instability of the Couette flow for the 2D Euler dynamic. *Proc. of the ICM. 2018.*

5. J. Bedrossian. A brief summary of nonlinear echoes and Landau damping. *arXiv:1712.08498 Proc. Journées EDP.* 2017.

Textbooks and monographs

1. *In progress for Nachdiplom series*: J. Bedrossian. "A primer on the mathematics of hydrodynamic stability at high Reynolds number".

2. J. Bedrossian and V. Vicol; "The mathematical analysis of the incompressible Euler and Navier-Stokes equations: an introduction". Graduate Studies in Mathematics Series. American Mathematical Society. 2022.

Journal editorial board positions

- Archive of Rational Mechanics and Analysis 2020–
- Ars Inveniendi Analytica 2020–
- SIAM journal of mathematical analysis 2021–2023

Teaching and Mentoring

Current mentees

- Ph.D. students: Ryan Arbon 2023–, Elias Manuelides 2024–, Albert Beaumer 2025–.
- Post-docs: Patrick Flynn 2023–

Previous mentees

- Undergraduate: Charlie Parker 2015-2017 (Ph.D. student at Brown University then NSF post-doc at Oxford).
- Undergraduate: Will Golding 2016-2019 (Ph.D. student at UT Austin).
- Graduate: Kyle Liss 2017–2021 (Post-doc at ICERM then Duke University). Stavros Papathanasiou 2018–2023 (EY senior consultant, quantitative finance).
- Post-doc: Mikael Latocca 2022–2023. (Maître de conférence à l'université d'Évry)
- Post-doc: Michele Coti Zelati 2014-2017 (Reader, Imperial College London).
- Post-doc: Sam Punshon-Smith 2017-2018 (NSF post-doc Brown, then IAS visitor, then Asst. Prof. Tulane University).
- Post-doc: Fei Wang 2017-2020 (Asst. Professor Shanghai Jiao Tong University).
- Post-doc: Alex Blumenthal 2019–2020 (Asst. Prof. Georgia Tech University).