

# Benjamin Seeger

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CONTACT INFORMATION      University of Texas at Austin      [seeger@math.utexas.edu](mailto:seeger@math.utexas.edu)  
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Austin, TX 78712

RESEARCH INTERESTS      Mean field games, nonlinear partial differential equations, homogenization and asymptotic behavior, numerical schemes, stochastic partial differential equations, rough paths

EMPLOYMENT      **University of Texas at Austin**  
NSF RTG Postdoctoral Instructor, 2021-present

**Collège de France**

NSF Postdoctoral Research Fellowship, 2019-2021  
Mentor: Pierre-Louis Lions  
Supported by NSF award DMS-1902658

**Université Paris-Dauphine (CEREMADE)**

Postdoctoral fellow, 2019-2021  
Mentor: Pierre Cardaliaguet

GRANTS AND AWARDS      **NSF DMS-2307610**, 2023-2026  
“Nonlinear Stochastic Partial Differential Equations and Applications”

**NSF DMS-1902658**, 2019-2021  
Postdoctoral Research Fellowship

VISITING POSITIONS      **University of Chicago**  
**Institute for Mathematical and Statistical Innovation**  
Visiting Scholar, Fall 2021

**Technische Universität Berlin**  
**Berlin Mathematical School**  
Visiting Dirichlet Fellow, 2019-2021

EDUCATION      **University of Chicago**  
Ph.D. in Mathematics, June 2019. Advisor: Panagiotis Souganidis  
M.S. in Mathematics, June 2015

**University of Wisconsin - Madison**  
B.S. in Mathematics and in Violin Performance, June 2013

- Honors in the mathematics major
- Certificate in Computer Science, 2011

PREPRINTS AND  
PUBLICATIONS

A comparison principle for semilinear Hamilton-Jacobi-Bellman equations in the Wasserstein space (with S. Daudin), arXiv:2308.15174 [math.AP]

Linear and nonlinear transport equations with coordinate-wise increasing velocity fields (with P.-L. Lions), arXiv:2307.05819 [math.AP]

Transport equations and flows with one-sided Lipschitz velocity fields (with P.-L. Lions), arXiv:2306.13288 [math.AP]

Mean field games with common noise and degenerate idiosyncratic noise (with P. Cardaliaguet and P. E. Souganidis), arXiv:2207.10209 [math.AP]

The Neumann problem for fully nonlinear SPDE (with P. Gassiat). To appear in *Ann. Appl. Probab.* arXiv:2110.10337 [math.AP]

Interpolation results for pathwise Hamilton-Jacobi equations (with P.-L. Lions and P. E. Souganidis). *Indiana Univ. Math. J.* 71 (2022), no. 5, 2127–2194.

Besov rough path analysis (with P. Friz and an appendix by P. Zorin-Kranich). *J. Differential Equations* 339 (2022), 152–231.

Dimension reduction techniques in deterministic mean field games (with J.-M. Lasry and P.-L. Lions). *Comm. Partial Differential Equations* 47 (2022), no. 4, 701–723.

Hölder regularity of Hamilton-Jacobi equations with stochastic forcing (with P. Cardaliaguet). *Trans. Amer. Math. Soc.* 374 (2021), no. 10, 7197–7233.

Homogenization of a stochastically forced Hamilton-Jacobi equation. *Ann. Inst. H. Poincaré Anal. Non Linéaire* 38 (2021), no. 4, 1217–1253.

Scaling limits and homogenization of mixing Hamilton-Jacobi equations. *Comm. Partial Differential Equations* 46 (2021), no. 1, 165–199.

Approximation schemes for viscosity solutions of fully nonlinear stochastic partial differential equations. *Ann. Appl. Probab.* 30 (2020), no. 4, 1784–1823.

Perron’s method for pathwise viscosity solutions. *Comm. Partial Differential Equations* 43, 6 (2018), 998–1018.

Homogenization of pathwise Hamilton-Jacobi equations. *J. Math. Pures Appl.* (9) 110 (2018), 1–31.

On the size of the resonant set for the products of  $2 \times 2$  matrices (with J. Allen and D. Unger). *Involve* 4 (2011), no. 2, 157–166.

INVITED TALKS

October 2023 Penn State University  
PDE Workshop

June 2023 University of North Carolina Wilmington  
13th AIMS Conference on Dynamical Systems, Differential  
Equations and Applications

INVITED TALKS (CTD.)	May 2023	University of Wisconsin - Madison Madison Workshop in PDE 2020
	February 2023	Institute for Mathematical and Statistical Innovation Distributed Solutions to Complex Societal Problems Reunion Workshop
	December 2022	Lagrange Mathematics and Computing Research Center Mean Field Games and Applications
	September 2022	Monash University Stochastic Differential Equations and their Applications
	August 2022	FU Berlin Stochastic and Rough Analysis
	March 9, 2022	University of Texas at Austin Analysis Seminar
	Feb. 21, 2022	University of Sydney Asia-Pacific Analysis and PDE Seminar
	Dec. 13-17, 2021	Institute for Mathematical and Statistical Innovation Mathematical Advances in Mean Field Games
	Sept. 13-17, 2021	Humboldt Universität Berlin, Germany 15th International Conference on Free Boundary Problems
	Feb. 10-12, 2021	Oxford University 14th Oxford-Berlin Young Researchers Meeting on Applied Stochastic Analysis
	January 11, 2021	University of California, Los Angeles Analysis and PDE Seminar
	December 7, 2020	Oberwolfach New Directions in Rough Path Theory
	August 31 - Sept. 4, 2020	Humboldt Universität Berlin, Germany (postponed) 15th International Conference on Free Boundary Problems
	June 12-13, 2020	Friedrich Schiller Universität Jena (postponed) Very Recent Advances in Stochastic Analysis
	June 8, 2020	Technische Universität Berlin 13th Annual Berlin-Oxford Young Researchers Meeting on Ap- plied Stochastic Analysis
	February 13, 2020	Technische Universität Berlin Rough paths, stochastic partial differential equations, and re- lated topics
	December 13, 2019	Collège de France (see video of the talk here) Applied Mathematics Seminar

INVITED TALKS (CTD.)	December 4, 2019	Oxford University 12th Oxford-Berlin Young Researchers Meeting on Applied Stochastic Analysis
	October 3, 2019	TU Delft, Egmond aan Zee, The Netherlands EnuMath 2019 miniseminar: Numerical methods for conservation laws with stochastic terms
	January 30, 2019	Pennsylvania State University, State College, PA Applied analysis seminar
	December 18, 2018	Max Planck Institute, Leipzig, Germany Working seminar in applied analysis
	August 20, 2018	Durham University, Durham, UK LMS EPSRC Durham Symposium Homogenisation in Disordered Media
	April 21, 2018	Northeastern University, Boston AMS Spring Eastern Sectional Meeting Special Session on Effective Behavior in Random Environments
	April 11, 2017	Max Planck Institute, Leipzig, Germany Working seminar in applied analysis
	March 29 - April 7, 2017	Technische Universität Berlin Seminar in rough paths, stochastic partial differential equations and related topics
	February 27, 2017	University of Wisconsin - Madison PDE Seminar

TEACHING

*Instructor*

Spring 2024	Graduate Topics Course	UT Austin
Fall 2023	Intro. to Real Analysis (M 361K)	UT Austin
Spring 2023	Integral Calculus (M 408L)	UT Austin
Fall 2022	Integral Calculus (M 408L)	UT Austin
Spring 2022	Integral Calculus (M 408L)	UT Austin
Winter 2019	Calculus III (Math 15300)	University of Chicago
Fall 2018	Calculus II (Math 15200)	University of Chicago
Fall 2017	Calculus II (Math 15200)	University of Chicago
Fall 2016	Calculus III (Math 15300)	University of Chicago
Winter 2016	Elementary Functions and Calculus II (Math 13200)	University of Chicago
Fall 2015	Elementary Functions and Calculus I (Math 13100)	University of Chicago

TEACHING (CTD.)	<i>Teaching Assistant</i>		
	Summer 2018	Stochastic Homogenization	PCMI
	Summer 2017, 2018	Analysis “Boot Camp”	University of Chicago
	Summer 2016	Summer School in Analysis	University of Chicago
	2014–2015	Honors Analysis (Math 20700-20900)	University of Chicago
	Summer 2014	REU	University of Chicago
SERVICE	2016–2018	Treasurer, University of Chicago chapter of the Association for Women in Mathematics (AWM)	
	2010–2011	Math Tutor University Residence Halls University of Wisconsin - Madison	
	Fall 2009	Math Tutor Greater University Tutoring Services University of Wisconsin - Madison	
HONORS AND AWARDS	2021	Institute for Mathematical and Statistical Innovation Visiting Scholarship	
	2020–2021	Berlin Mathematical School Dirichlet Visiting Fellowship	
	2019–2021	NSF Mathematical Sciences Postdoctoral Research Fellowship	
	2016	Nominated: Physical Sciences Teaching Prize	
	2015	NSF Graduate Research Fellowship - Honorable Mention	
	2013–2014	GAANN Fellowship, University of Chicago	
	2013	James R. Smith Orchestra Award, School of Music University of Wisconsin - Madison	
	2013	Jean-Pierre and Jance Golay Scholarship in Memory of Vartan Manoogian, School of Music University of Wisconsin - Madison	
	2012	Frank Cady Scholarship, Department of Mathematics University of Wisconsin - Madison	
	2011	Mark Ingraham Scholarship, Department of Mathematics University of Wisconsin - Madison	
	2009	Summer Music Clinic Scholarship (full merit scholarship to attend UW-Madison)	