

# Huy Quang Nguyen

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CONTACT INFORMATION	Department of Mathematics Brown University Box 1917, 151 Thayer Street Providence, RI 02912	<a href="mailto:hnguyen@math.brown.edu">hnguyen@math.brown.edu</a> <a href="https://www.math.brown.edu/~hnguyen/">https://www.math.brown.edu/~hnguyen/</a>
RESEARCH INTERESTS	Partial Differential Equations, Mathematical Fluid Mechanics, Fourier Analysis, Harmonic Analysis.	
APPOINTMENTS	July 2018- : Tamarkin Assistant Professor, Department of Mathematics, Brown University.  Sep 2016-June 2018: Postdoctoral Research Associate & Lecturer, Department of Mathematics and PACM, Princeton University. Mentor: Peter Constantin.  Sep 2012-Aug 2013: Teaching Assistant, Department of Mathematics and Computer Science, HCMC University of Science, Viet Nam.	
EDUCATION	<b>University Paris-Sud XI, France</b> Ph.D. in Mathematics, July 2016 <ul style="list-style-type: none"><li>• Dissertation Topic: High frequency analysis for water waves systems</li><li>• Advisor: Nicolas Burq</li><li>• Thesis Reviewers: David Lannes and Steve Shkoller.</li><li>• Thesis Defense Committee: Hajer Bahouri (President), Nicolas Burq, David Lannes, Jean-Claude Saut, and Claude Zuily.</li></ul> <b>University of Orléans, France &amp; HCMC University of Science, Viet Nam</b> Master 2 in Applied Mathematics, July 2013 <ul style="list-style-type: none"><li>• Thesis Topic: Paradiifferential calculus and applications to the Cauchy problem</li><li>• Advisor: Nicolas Burq</li><li>• Mention: très bien</li></ul> <b>HCMC University of Science, Viet Nam</b> B.S. in Mathemtics and Computer Science, Honors Program, September 2012 <ul style="list-style-type: none"><li>• Thesis Topic: Variational method for nonlinear elliptic problems</li><li>• Advisor: Duong Minh Duc</li><li>• Mention: high distinction; Valedictorian.</li></ul>	
HONORS & AWARDS	<ul style="list-style-type: none"><li>• NSF Grant DMS-1907776 (2019-2022), \$173,696 <i>Link</i>.</li><li>• AMS Simons Travel Grant (2019-2021) (declined due to conflict with NSF grant).</li><li>• 2013-2016: Hadamard Mathematics LabEx Ph.D. fellowship, awarded by Fondation mathématique Jacques Hadamard.</li><li>• April-July 2013: Master Internship at University Paris-Sud XI, awarded by Fondation mathématique Jacques Hadamard.</li><li>• 2012: Valedictorian, HCMC University of Science.</li><li>• 2008-2012: Odon Vallet Scholarships for outstanding students.</li><li>• 2008-2012: Kumho Asiana-Vietnam Scholarships for outstanding students.</li></ul>	

- SUBMITTED PAPERS
1. *Well-posedness for SQG sharp fronts with unbounded curvature*, with F. Gancedo and N. Patel), arXiv:2007.05018, 2021.
  2. *Global solutions for the Muskat problem in the scaling invariant Besov space  $\dot{B}_{\infty,1}^1$* , arXiv:2103.14535, 2021.
  3. *Global well-posedness for the one-phase Muskat problem*, with H. Dong, and F. Gancedo, arXiv:2103.02656, 2021.
  4. *Proof of modulational instability of Stokes waves in deep water*, with W. Strauss, arXiv:2007.05018, 2020.
- PUBLISHED/ACCEPTED PAPERS
1. *The vanishing surface tension limit of the Muskat problem*, with P. Flynn  
**Communication in Mathematical Physics**, 382, 1205–1241, 2021.
  2. *On well-posedness of the Muskat problem with surface tension*,  
**Advances in Mathematics**, 374, 2020.
  3. *A paradiﬀerential approach for well-posedness of the Muskat problem*, with B. Pausader  
**Archive for Rational Mechanics and Analysis**, 237(1), 35–100, 2020.
  4. *On global stability of optimal rearrangement maps*, with Toan T. Nguyen  
**Archive for Rational Mechanics and Analysis**, 238(2), 671–704, 2020.
  5. *Compressible fluids and active potentials*, with P. Constantin, T. D. Drivas, and F. Pasqualotto  
**Annales de l’Institut Henri Poincaré (C) Analyse Non Linéaire**, 37(1), 145–180, 2020.
  6. *Remarks on the emergence of weak Euler solutions in the vanishing viscosity limit*, with T. D. Drivas  
**Journal of Nonlinear Science**, 29(2), 709–721, 2019.
  7. *Inviscid limit for SQG in bounded domains*, with P. Constantin and M. Ignatova  
**SIAM Journal of Mathematical Analysis**, 50(6), 6196–6207, 2018.
  8. *Onsager’s conjecture and anomalous dissipation on domains with boundary*, with T. D. Drivas  
**SIAM Journal of Mathematical Analysis**, 50(5), 4785–4811, 2018.
  9. *On singularity formation in a Hele-Shaw model*, with P. Constantin, T. Elgindi, and V. Vicol  
**Communication in Mathematical Physics**, 363(1), 139–171, 2018.
  10. *Local and global strong solutions for SQG in bounded domains*, with P. Constantin  
**Physica D-Special Issue in Honor of Edriss Titi**, Vol. 376-378 , 195–203, 2018.
  11. *Global weak solutions for generalized SQG in bounded domains*,  
**Analysis & PDE**, 11(4), 1029–1047, 2018.
  12. *Global weak solutions for SQG in bounded domains*, with P. Constantin  
**Communication on Pure and Applied Mathematics**, 71(11), 2323–2333, 2018.
  13. *Sharp Strichartz estimates for water waves systems*,  
**Transactions of the AMS**, 370, 8797–8832, 2018.
  14. *A sharp Cauchy theory for 2D gravity-capillary water waves*,  
**Annales de l’Institut Henri Poincaré (C) Analyse Non Linéaire**, 34(7), 1793–1836, 2017.
  15. *Strichartz estimates and local existence for the gravity-capillary water waves with non-Lipschitz initial velocity*, with T. de Poyferré  
**Journal of Differential Equations**, 261(1), 396–438, 2016.

16. *A paradifferential reduction for the gravity-capillary waves system at low regularity and applications*, with T. de Poyferré  
**Bulletin de la Société Mathématique de France** 145(4), 643–710, 2017.
17. *A pseudo-local property of gravity water waves system*,  
**SIAM Journal of Mathematical Analysis**, 48(3) 1988–2027, 2016.
18. *Hadamard well-posedness of the gravity water waves system*,  
**Journal of Hyperbolic Differential Equations**, 13(4) 791–820, 2016.

#### UNDERGRADUATE PUBLICATIONS

1. H. Q. Nguyen, *Non uniformly elliptic equations with non-uniformly  $p$ -superlinear nonlinearities*,  
**Differential and Integral Equations**, 27(9) 977–1000, 2014.
2. *Non-uniformly asymptotically linear  $p$ -Laplacian problems*, with D. M. Duc  
**Nonlinear Analysis**, 92, 183–197, 2013.

#### TEACHING EXPERIENCE

- Spring 2021: Graduate PDE, Brown University.
- Spring 2020: Math 0180 Intermediate Calculus (Calculus III), Brown University.
- Fall 2019: Math 1110 Ordinary Differential Equations, Brown University.
- Spring 2019: Math 0180 Intermediate Calculus (Calculus III), Brown University.
- Fall 2018: Math 1110 Ordinary Differential Equations, and Math 0100 Introductory Calculus II, Brown University.
- Spring 2018: MAT 322 Introduction to Differential Equations, Princeton University.
- Fall 2017: MAT 104 Calculus II, Princeton University.
- Spring 2013: Teaching Assistant for Real Analysis, HCMC University of Science.
- Fall 2012: Teaching Assistant for Analysis I: Functions of One Variable, HCMC University of Science.

#### CONFERENCE TALKS

- AMS Fall Eastern Sectional Meeting by Zoom–Special session on “Conservation laws and nonlinear wave equations”; October 2020.
- SIAM Conference on Analysis of PDE–Symposium “Recent Results in Incompressible Fluid Mechanics”, La Quinta CA; December 2019.
- Workshop on recent developments in nonlinear waves, University of Illinois Chicago; November 2018.
- AMS Sectional Meeting at University of Arkansas–Special Session “Recent Advances in Mathematical Fluid Mechanics”; November 2018.
- AMS Sectional Meeting at University of Michigan–Special Session “Analytical and Numerical Aspects of Turbulent Transport”; October 2018.
- AMS Sectional Meeting at Vanderbilt University–Special Session “Evolution Equations and Applications”; April 2018.
- Joint Mathematics Meetings–AMS Special Session “Analysis of Nonlinear Partial Differential Equations and Applications”, San Diego; January 2018.
- SIAM Conference on Analysis of PDE–Symposium “Mathematical Analysis in Incompressible Fluid Dynamics”, Baltimore; December 2017.
- Princeton-Tokyo Fluid Mechanics Workshop, Princeton; November 2017.
- Summer Meeting Conference, University of Sciences, Ho Chi Minh city; August 2014.

SEMINAR &  
COLLOQUIUM TALKS

- Special Colloquium, Rutgers University; December 2020.
- Colloquium, University of Maryland at College Park; December 2020.
- Colloquium, Texas A&M; December 2020.
- Special Seminar, North Carolina State University; December 2020.
- Analysis of Fluids and Related Topics Seminar, Princeton University; November 2020.
- Analysis Seminar, University of Oklahoma; November 2020.
- MI-MST Joint Analysis Seminar; July 2020.
- PDE Seminar via Zoom, ShanghaiTech University; June 2020.
- Online North East PDE and Analysis Seminar (ONEPAS); April 2020.
- PDE Geometric Analysis Seminar; University of Wisconsin; March 2020 (canceled due to pandemic).
- Analysis and PDE Seminar; University of Massachusetts Amherst; December 2019.
- PDE and Applied Math Seminar; University of California at Davis; November 2019.
- CAMS Colloquium, University of Southern California; November 2019.
- Partial Differential Equations Seminar, Vanderbilt University; March 2019.
- Differential Equations Seminar, University of Tennessee; February 2019.
- Analysis Seminar, Brown University; December 2018.
- Partial Differential Equations Seminar, Brown University; November 2018.
- Partial Differential Equations and Geometric Analysis Seminar, University of Wisconsin–Madison; March 2018.
- Partial Differential Equations Seminar, Brown University; March 2018.
- Partial Differential Equations Seminar, Penn State University; February 2018.
- Analysis Seminar, UC San Diego; January 2018.
- Ergodic Theory & Statistical Mechanics Seminar, Princeton University; November 2017.
- Analysis Seminar, Courant Institute; November 2017.
- New Faculty Talks, Princeton; October 2017.
- Analysis of Fluids and Related Topics Seminar, Princeton University; October 2016.
- Graduate Student Seminar, Orsay; January 2016.
- Partial Differential Equations Seminar, Mathematics Research Institute of Rennes; October 2015.
- Numerical Analysis and Partial Differential Equations Seminar, University Paris-Sud 11; April 2015.

## SERVICE

- Co-organizer of the Fluid and Related Topic Seminar at Princeton University, 2017-2018.
- Co-organizer of the PDE Seminar at Brown University, 2019-2021.
- Co-organizer of the symposium “Regularity, Singularity and Turbulence in Fluids” (3 parts) for the SIAM Conference on PDE 2019.
- Co-organizer of the special session “Analysis of PDE in Fluid Dynamics: Theory and Numerics” for the AMS Sectional Meeting at Purdue, 2020, canceled due to pandemic.
- Referee for Annals of PDE, Archive for Rational Mechanics and Analysis, Communication in Mathematical Physics, Journal of the AMS, Journal of the EMS, Journal of Differential Equations, Nonlinearity, Nonlinear Analysis, Nonlinear Analysis: Real World Applications, Proceeding of the AMS, SIAM Journal on Mathematical Analysis, Water Waves.