

Mihaela Ignatova

Curriculum Vitae

Department of Mathematics
Temple University
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Education

- **University of Southern California**, Los Angeles, CA
Ph.D. in Mathematics, August 2011
Advisor: Prof. Igor Kukavica
- **Sofia University “St. Kliment Ohridski”**, Sofia, Bulgaria
M.Sc. in Mathematics and Mathematical Physics, June 2006
Advisor: Prof. Emil Horozov
- **Université de Nantes**, Nantes, France
Maîtrise de Mathématiques, June 2004
- **Sofia University “St. Kliment Ohridski”**, Sofia, Bulgaria
B.Sc. in Mathematics, June 2004

Appointments

- **Temple University**, Philadelphia, PA
Assistant Professor, July 2018–current
- **Princeton University**, Princeton, NJ
Instructor, September 2014–2018
- **Stanford University**, Stanford, CA
Postdoctoral Fellow, September 2012–2014
- **University of California, Riverside**, Riverside, CA
Visiting Assistant Professor, September 2011–2012

Research Interests

- Partial Differential Equations, Mathematical Fluid Dynamics, Harmonic Analysis

Graduate Students

- Elie Abdo, current

Postdocs

- Jingyang Shu, current

Publications

30. E. Abdo, M. Ignatova, *On Electroconvection in Porous Media*, submitted (2021).
29. M. Ignatova, J. Shu, *Global Smooth Solutions of the Nernst-Planck-Darcy System*, submitted (2021). arXiv:2107.13655 [math.AP].
28. E. Abdo, M. Ignatova, *On the Space Analyticity of the Nernst-Planck-Navier-Stokes system*, submitted (2021).
27. M. Ignatova, J. Shu, *Global Solutions of the Nernst-Planck-Euler Equations*, SIAM J. Math. Anal., 53(5), (2021) 5507–5547. arXiv:2101.03199 [math.AP].
26. P. Constantin, M. Ignatova, F.-N. Lee, *Interior Electroneutrality in Nernst-Planck-Navier-Stokes Systems*, Arch Rational Mech Anal **242** (2021), 1091–1118 (2021). <https://doi.org/10.1007/s00205-021-01700-0>. arXiv:2011.15057 [math.AP].
25. E. Abdo, M. Ignatova, *Long Time Finite Dimensionality in Charged Fluids*, Nonlinearity **34** (2021) no. 9, 6173–6209.
24. P. Constantin, M. Ignatova, F.-N. Lee, *Nernst-Planck-Navier-Stokes systems far from equilibrium*, Arch Rational Mech Anal **240**, 1147–1168 (2021). arXiv:2008.10462 [math.AP].
23. P. Constantin, M. Ignatova, F.-N. Lee, *Nernst-Planck-Navier-Stokes systems near equilibrium*, to appear in Pure and Applied Functional Analysis (2021). arXiv:2008.10440 [math.AP].
22. E. Abdo, M. Ignatova, *Long time dynamics of a model of electroconvection*, Trans. Amer. Math. Soc. **374** (2021), 5849–5875.
21. P. Constantin, M. Ignatova, *Estimates near the boundary for critical SQG*, Ann. PDE, **6** (1) (2020). <https://doi.org/10.1007/s40818-020-00079-7>.
20. M. Ignatova, *Construction of solutions of the critical SQG equation in bounded domains*, Advances in Mathematics, **351** (2019), 1000–1023.
19. P. Constantin, M. Ignatova, *On the Nernst-Planck-Navier-Stokes system*, Archive for Rational Mechanics and Analysis, **232** (2019) no. 3, 1379–1428.
18. P. Constantin, M. Ignatova, H.Q. Nguyen, *Inviscid limit for SQG in bounded domains*, SIAM J. Math. Anal. **50** (2018), no. 6, 6196–6207.
17. P. Constantin, T. Elgindi, M. Ignatova, V. Vicol, *On some electroconvection models*, Journal of Nonlinear Science **27** (2017), no. 1, 197–211.
16. P. Constantin, T. Elgindi, M. Ignatova, V. Vicol, *Remarks on the inviscid limit for the Navier-Stokes equations for uniformly bounded velocity fields*, SIAM J. Math. Anal. **49** (2017) no. 3, 1932–1946.
15. P. Constantin and M. Ignatova, *Critical SQG in bounded domains*, Ann. PDE, **2** (2016), no 8.
14. M. Ignatova and I. Kukavica, *On the local existence of the free-surface Euler equation with surface tension*, Asymptotic Analysis, **100** (2016), no. 1-2, pp. 63–86.
13. P. Constantin and M. Ignatova, *Remarks on the fractional Laplacian with Dirichlet boundary conditions and applications*, Int Math Res Notices **2017** (2017), no. 6, 1653–1673.

12. M. Ignatova, I. Kukavica, I. Lasiecka, and A. Tuffaha, *Small data global existence for a fluid-structure model*, *Nonlinearity* **30** (2017), no. 2, 848–898.
11. M. Ignatova and V. Vicol, *Almost global existence for the Prandtl boundary layer equations*, *Archive for Rational Mechanics and Analysis* **220** (2016), no. 2, 809–848.
10. M. Ignatova, G. Iyer, J. Kelliher, R. Pego, and A. Zarnescu, *Global well-posedness results for two extended Navier-Stokes systems*, *Commun. Math. Sci.* **13** (2015), no. 1, 249–267.
9. M. Ignatova, *On the continuity of solutions to advection-diffusion equations with slightly super-critical divergence-free drifts*, *Advances in Nonlinear Analysis* **3** (2014), no. 2, 81–86.
8. M. Ignatova, I. Kukavica, I. Lasiecka, and A. Tuffaha, *On well-posedness and small data global existence for an interface damped free boundary fluid-structure model*, *Nonlinearity* **27** (2014), no. 3, 467–499.
7. M. Ignatova, I. Kukavica, and L. Ryzhik, *The Harnack inequality for second-order parabolic equations with divergence-free drifts of low regularity*, *Comm. PDEs* **41** (2016), no. 2, 208–226.
6. M. Ignatova, I. Kukavica, and L. Ryzhik, *The Harnack inequality for second-order elliptic equations with divergence-free drifts*, *Commun. Math. Sci.* (2014) **12**, no. 4, 681–694.
5. M. Ignatova, I. Kukavica, I. Lasiecka, and A. Tuffaha, *On the well-posedness for a free boundary fluid-structure model*, *J. Math. Phys.* **53** (2012), no. 11, 115624, 13pp.
4. M. Ignatova, I. Kukavica, and M. Ziane, *Local existence of solutions to the free boundary value problem for the primitive equations of the ocean*, *J. Math. Phys.* **53** (2012), no. 10, 103101, 17pp.
3. M. Ignatova and I. Kukavica, *Strong unique continuation for the Navier-Stokes equation with non-analytic forcing*, *J. Dynam. and Differential Equations* **25** (2013), no. 1, 1–15.
2. M. Ignatova and I. Kukavica, *Strong unique continuation for higher order elliptic equations with Gevrey coefficients*, *J. Differential Equations* **252**, (2012), no. 4, 2983–3000.
1. M. Ignatova and I. Kukavica, *Unique continuation and complexity of solutions to parabolic partial differential equations with Gevrey coefficients*, *Adv. Differential Equations* **15** (2010), no. 9, 953–975.

Academic Service

- Co-organizing the Princeton Mathematics Department Colloquium, Princeton University, 2015–16
- Co-organizing the Analysis of Fluids and Related Topics Seminar, Princeton University, 2015–18
- Graduate Committee, Temple University, 2018–current
- Dean’s Advisory Committee, Temple University, 2020–current
- Member of the Faculty mentoring program for undergraduates, Temple University, 2020–current
- Co-organizing the Grosswald Lectures, 2021–current

Awards

- Selma Lee Bloch Brown Professorship, 2020–24
- AWM Sadosky Research Prize in Analysis, 2020
- Grayson and Judith Manning Fellowship, Graduate School/Provost’s Office, USC, Los Angeles, 2011–2012

- Theodore Edward Harris Graduate Research Prize, USC, Los Angeles, Spring 2011
- Women in Science and Engineering (WiSE) Merit Award, College of Letters, Arts, and Sciences Merit Fellowship, USC, Los Angeles, 2010–2011
- College of Letters, Arts, and Sciences Merit Fellowship, USC, Los Angeles, Spring 2010
- Merit-based Full Scholarship, University of Nantes, France, 2003–2004

Recent Presentations

- CAMS Colloquium, USC, March 2022
- Vanderbilt Shanks Workshop on *Mathematical Aspects of Fluid Dynamics*, February 2022
- AMS, SS Recent Advances in Fluids and Related Models, January 2022
- Applied Math Seminar, Drexel University, November 2021
- Applied Analysis Seminar, Louisiana State University, October 2021
- BIRS CMO Workshop *New Trends in Nonlinear Diffusion: a Bridge between PDEs, Analysis and Geometry*, September 2021
- BIRS Workshop *New Mechanisms for Regularity, Singularity, and Long Time Dynamics in Fluid Equations*, July 2021
- MCA, SS New Developments in Mathematical Fluid Dynamics, July 2021
- AMS SS *Regularity Theory for Linear and Nonlinear PDEs*, May 2021
- MSRI Workshop on *Recent Developments in Fluid Dynamics*, April 2021
- AIM Workshop *Criticality and stochasticity in quasilinear fluid systems*, April 2021
- Nonlinear PDEs seminar, Texas A&M, October 2020
- SIAM Conference on Analysis of PDEs, La Quinta, CA, December 2019
- Workshop *Mathematical Aspects of Hydrodynamics*, Oberwolfach, Germany, August 2019
- CIME, *Progress in Mathematical Fluid Dynamics*, Cetraro, Italy, June 2019
- Fluids and Variational Methods Conference, Budapest, Hungary, June 2019
- PDE seminar, Vanderbilt University, TN, April 2019
- AMS Sectional Meeting, Ann Arbor, MI, October 2018
- Analysis seminar, Temple University, September 2018
- Workshop on *Regularity and Blow-up of Navier-Stokes Type PDEs using Harmonic and Stochastic Analysis*, BIRS, Banff, Canada, August 2018
- Workshop on *Mathematical Analysis of Incompressible Fluids*, IMUS, Sevilla, Spain, June 2018
- SCAPDE Conference, U.C. San Diego, CA, June 2018
- Department colloquium, NJIT, NJ, January, 2018
- SIAM conference on Analysis of PDEs, Baltimore, MD, December 2017
- Department colloquium, Temple University, PA, December 2017
- Department colloquium, Princeton University, NJ, November 2017
- Princeton-Tokyo Fluid Mechanics Workshop, Princeton, NJ, November 2017

- Workshop on *Irregular transport: analysis and applications*, Basel, Switzerland, June 2017
- Workshop on *Essence of $(u \cdot \nabla)u$* , University of Virginia, May 2017
- AMS Sectional Meeting, Hunter College, New York, NY, April 2017
- KUMUNU Conference, University of Nebraska-Lincoln, April 2017
- Analysis seminar, University of Pennsylvania, April 2017

Recent Teaching Experience

- **Course Instructor at Temple University**
 - Math 2941, Honors Differential Equations, Spring 2022
 - Math 8041, Real Analysis I, Fall 2021
 - Math 8142, Partial Differential Equations II, Spring 2021
 - Math 8141, Partial Differential Equations I, Fall 2020
 - Math 8042, Real Analysis II, Spring 2020
 - Math 8041, Real Analysis I, Fall 2019
 - Math 2943, Honors Calculus III, Fall 2018
- **Course Instructor at Princeton University**
 - MAT 320, Introduction to Real Analysis, Fall 2017
 - MAT 425, Real Analysis, Spring 2016
 - MAT 201, Multivariable Calculus, Fall 2015 and Fall 2017
 - MAT 103, Calculus I, Fall 2014
- **Course Instructor at Stanford University**
 - Math 173, Theory of Partial Differential Equations, Spring 2014
 - Math 131P, Partial Differential Equations I, Winter 2014
 - Math 51, Linear Algebra and Multivariable Calculus, Summer 2013
 - Math 42, Calculus (Accelerated), Winter 2013