

Noah Stevenson

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Education

Princeton University, *Doctor of Philosophy in Mathematics Candidate* (2021–Present)

- *Advisor*: Alexandru Ionescu

Carnegie Mellon University, *Master of Science in Mathematics* (2019–2021)

- *GPA*: 4.00/4.00.
- *Honors Degree Program*: undergraduate and master degree programs are completed simultaneously.
- *Advisor*: Ian Tice.
- *Thesis*: Analysis of Micropolar Fluids, Screened Sobolev Spaces, and Multilayer Free Boundary Incompressible Navier-Stokes Equations.

Carnegie Mellon University, *Bachelor of Science in Mathematics* (2017–2021)

- *GPA*: 4.00/4.00.
- *Mathematical Studies Program*: honors undergraduate course sequence in analysis and algebra.
- *Minor in Physics*.

Awards, Grants, & Scholarships

- Princeton University Department of Mathematics Merit Award 2021
- National Science Foundation Graduate Research Fellowship (2021–2026)
- Barry M. Goldwater Scholar (2020–2021)
- Summer Research in Partial Differential Equations Grant (2019–2020)
- Roger N. Pedersen Memorial Award (2019–2020)
- Richard A. Moore Scholar (2018–2019)

Interests

Nonlinear partial differential equations, free boundary problems, fluid mechanics, viscous and inviscid traveling surface waves, Navier-Stokes equations, Euler equations, Darcy flow, desingularization, vortex patches, harmonic analysis, functional analysis, function spaces, interpolation theory, bifurcation theory.

Papers

12. N. Stevenson & I. Tice. *Traveling wave solutions to the free boundary incompressible Navier-Stokes equations in the limit of vanishing capillarity* (2026). In preparation.
11. R. O. Radu & N. Stevenson. *Desingularization of Kirchhoff elliptical vortices and nondegenerate steady rotating vortex patch solutions to the planar Euler equations* (2025). In preparation.
10. H. Q. Nguyen & N. Stevenson. *Large traveling gravity waves for free boundary Darcy flow* (2025). In preparation.
9. N. Stevenson & I. Tice. *Gravity driven traveling bore wave solutions to the free boundary incompressible Navier-Stokes equations* (2025). 66 pp. arXiv: <https://arxiv.org/abs/2505.24562>.
8. N. Stevenson & I. Tice. *Stationary wave solutions to two dimensional viscous shallow water equations: theory of small and large solutions* (2025). 64 pp. arXiv: <https://arxiv.org/abs/2502.11899>.
7. N. Stevenson. *Periodic gravity-capillary roll wave solutions to the inclined viscous shallow water equations in two dimensions* (2024). 21 pp. SIAM J. Math. Anal.: <https://doi.org/10.1137/24M1674406>. arXiv: <https://arxiv.org/abs/2407.03478v2>.
6. N. Stevenson & I. Tice. *The traveling wave problem for the shallow water equations: well-posedness and the limits of vanishing viscosity and surface tension* (2023). 55 pp. Commun. Math. Phys., to

appear. arXiv: <https://arxiv.org/abs/2311.00160>.

5. N. Stevenson & I. Tice. *Well-posedness of the stationary and slowly traveling wave problem for the free boundary incompressible Navier-Stokes equations* (2023). 54 pp. J. Funct. Anal.: <https://doi.org/10.1016/j.jfa.2024.110617>. arXiv: <https://arxiv.org/abs/2306.15571>.
4. N. Stevenson & I. Tice. *Well-posedness of the traveling wave problem for the free boundary compressible Navier-Stokes equations* (2023). 158 pp. arXiv: <https://arxiv.org/abs/2301.00773>.
3. N. Stevenson & I. Tice. *Traveling wave solutions to the multilayer free boundary incompressible Navier-Stokes equations* (2020). 40 pp. SIAM J. Math. Anal.: <https://doi.org/10.1137/20M1360670>. arXiv: <https://arxiv.org/abs/2008.07435>.
2. N. Stevenson & I. Tice. *A truncated real interpolation method and characterizations of screened Sobolev spaces* (2020). 45 pp. Commun. Pure Appl. Anal.: <https://doi.org/10.3934/cpaa.2020250>. arXiv: <https://arxiv.org/abs/2003.12518v2>.
1. N. Stevenson & I. Tice. *Analysis of micropolar fluids: existence of potential microflow solutions, nearby global-well-posedness, stability and attractiveness* (2020). 32 pp. Acta Appl. Math.: <https://doi.org/10.1007/s10440-020-00363-5>. arXiv: <https://arxiv.org/abs/2001.07166>.

Talks

- Minisymposium on Nonlinear Waves and Interfacial Dynamics, SIAM PDE Conference. Pittsburgh, PA. November 2025.
- PDE-Applied Math Seminar, University of Maryland. College Park, MD. September 2025.
- DE Seminar, University of Michigan. Ann Arbor, MI. January 2025.
- Nonlinear PDE Seminar, Texas A&M University. College Station, TX. November 2024.
- Special Session on Fluids, Equadiff 2024. Karlstad, Sweden. June 2024.
- Recent developments in the study of free boundary problems in fluid mechanics, AMS Sectional Meeting. Washington D.C. April 2024.
- Summer School in Fluid Mechanics at Brin Center. College Park, MD. July 2023.

Teaching Assistant Roles

- Honors Linear Algebra, Spring 2024. Princeton University.
- Multivariable Calculus, Fall 2023. Princeton University.
- Mathematical Studies Analysis II, Spring 2021. Carnegie Mellon University.
- Mathematical Studies Analysis I, Fall 2020. Carnegie Mellon University.
- Mathematical Studies Analysis II, Spring 2020. Carnegie Mellon University.
- Mathematical Studies Analysis I, Fall 2019. Carnegie Mellon University.