

# QUYNH NGUYEN

Physics PhD

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## EDUCATION

**PhD, Physics.** *New York University, New York City, NY* 1/2021  
Thesis: "Emergent Flows, Irreversibility and Unsteady Effects in Asymmetric and Looped Geometries", 3/2021.  
**BS, Physics.** *University of Minnesota, Minneapolis, MN* 2015

## RESEARCH

**Research Fellow** 6/2021–present

*Nuclear Engineering and Radiological Sciences, University of Michigan*

- Turbulent buoyancy-driven jets interactions
- Thermal striping in nuclear reactor

**Research Assistant in Data Science** 3/2021–6/2021

*Center for Data Science and Physics Department, New York University*

- Implemented deep learning algorithms to perform topic modeling of physics journal articles in ArXiv
- Mining text data from 2 million articles in ArXiv to build tools for interdisciplinary communications

**Graduate Research Assistant in Experimental Fluid Dynamics** 2017–12/2020

*Applied Math Lab, Courant Institute of Mathematical Sciences, New York University*

- Designed experiments to study physics of flows in asymmetric and looped geometries
- Built customized equipment using CAD design, 3D printing, laser-cutting, and machining
- Performed experiments, flow visualization, data analysis and mathematical modeling
- Collaborated with modeling and simulation experts
- Discovered a mechanism of flow rectification in biological fluid dynamics
- Discovered early transition to turbulence in channel flows at  $Re \approx 200$
- Prepared manuscripts and published in high-impact journals as first author

**Undergraduate Research Assistant** 2014–2015

*Physics Department, University of Minnesota*

- Developed data acquisition algorithms, tested electronics, built equipment for NOvA and CMS particle physics experiments

**Summer Intern in Simulation** 2014

*Fermi National Accelerator Laboratory, Batavia, IL*

- Wrote Monte Carlo simulations in C++ for LBNE particle physics experiments.

## PUBLICATIONS & CONFERENCE TALKS

- Quynh M. Nguyen et al., "Early turbulence and pulsatile flows enhance diodicity of Tesla's macrofluidic valve," *Nature Communications*, 2021. [[article](#) | [press release](#) | [media feature](#)]
- Quynh M. Nguyen et al., "Flow rectification in loopy network models of bird lungs," *Physical Review Letters*, 2021. [[article](#) | [press release](#) | [media feature](#)]
- Quynh M. Nguyen et al., "Tesla's fluidic diode and the electronic-hydraulic analogy," *American Journal of Physics*, 2021. [[article](#)]

## TALKS

- Quynh M. Nguyen, "Geometric and topological pumping," Invited talk, Harvard University, 2021.
- Quynh M. Nguyen et al., "Emergent circulation in the loopy network of bird lungs," American Physical Society's Division of Fluid Dynamics Meeting, Chicago, 2020.
- Quynh M. Nguyen et al., "Testing Nikola Tesla's fluidic diode," American Physical Society's Division of Fluid Dynamics Meeting, Atlanta, 2018.

## TEACHING AND MENTORING

**Physics lab instructor**

1/2016—12/2020

*Department of Physics, New York University*

- Led undergraduate physics labs in mechanics, electricity and magnetism, optics, electronics
- Average student review: 4.5/5

**Research Mentor**

1/2018—12/2019

*Applied Math Lab, New York University*

- Mentored undergraduate and high school interns
- Mentored participants of Girls in Science, Technology, Engineering and Mathematics (GSTEM)
- Joint works with mentees led to publications, including a pedagogical [article](#) in *American Journal of Physics*.

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**TECHNICAL SKILLS****Computing:** MATLAB, Python, C++, SQL, shell scripting, labVIEW, Linux, Git, high performance computing**Electrical:** Digital Signal Processing, FPGA, microcontroller, Verilog, circuit analysis, soldering**Mechanical & other:** PIV, scientific cameras, machining, 3D printing, laser cutting, laser, optics, CAD, SolidWorks

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**HONORS AND AWARDS****MacCracken Fellowship:** for fully-funded doctoral studies

2015—2020

*New York University***Hagstrum Award:** for overall excellence and future promise in a graduating senior

2015

*University of Minnesota*