

# QUYNH NGUYEN

Fluid Dynamics Researcher

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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 EXPERIENCE

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

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

- Designed table-top 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
- Discovered a mechanism of flow rectification in biological fluid dynamics
- Discovered early transition to turbulence in channel flows at  $Re \approx 200$
- Published in high-impact journals as first author
- Mentoring undergraduate and high school interns

**Physics lab instructor** 1/2016–9/2020

*Department of Physics, New York University*

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

**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 Nguyen et al., "Early turbulence and pulsatile flows enhance diodicity of Tesla's macrofluidic valve," *Nature Communications*, 2021. ([article](#), [press release](#), [media feature](#))
- Quynh Nguyen et al., "Flow rectification in loopy network models of bird lungs," *Physical Review Letters*, 2021. ([article](#), [press release](#), [media feature](#))
- Quynh Nguyen et al., "Tesla's fluidic diode and the electronic-hydraulic analogy," *American Journal of Physics*, 2021. ([article](#))
- Quynh Nguyen et al., "Emergent circulation in the loopy network of bird lungs," American Physical Society's Division of Fluid Dynamics Meeting, Chicago, 2020.
- Quynh Nguyen et al., "Testing Nikola Tesla's fluidic diode," American Physical Society's Division of Fluid Dynamics Meeting, Atlanta, 2018.

## 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

## 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*

## REFERENCES

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**Leif Ristroph.** Prof. of Mathematics, Courant Insitute of Mathematical Sciences, New York University.

*PhD Advisor.* E-mail: lr1090@nyu.edu

**Jun Zhang.** Prof. of Physics and Mathematics, New York University and New York University Shanghai.

*PhD Advisor.* E-mail: jun@cims.nyu.edu

**Stephen Childress.** Emeritus Prof. of Mathematics, Courant Insitute of Mathematical Sciences, New York University.

*Mentor & co-author.* E-mail: childres@cims.nyu.edu