Benjamin E. Levy, Ph.D.

CONTACT INFORMATION

Physics Department
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EMPLOYMENT & EDUCATION

Assistant Professor of Physics **2025 - Present**
Lafayette College, Easton, PA

Visiting Assistant Professor of Physics **2022 - 2025**
Davidson College, Davidson, NC

Ph.D. in Physics **2022**
The University of North Carolina at Chapel Hill, Chapel Hill, NC
Dissertation title: "Toward Magnetomotive Ultrasound Elastometry of Thrombosis"

B.A. in Physics *with honors* **2015**
Carleton College, Northfield, MN

TEACHING EXPERIENCE

LAFAYETTE COLLEGE **2025 - Present**

- PHYS 152, Accelerated Physics II
  Fall 2025: 15 Students
- PHYS 342, Electromagnetic Fields
  Spring 2026: 10 Students
- Laboratory Sections
  PHYS 152, Accelerated Physics II ($\times 1$)
  PHYS 133, Physics II: Electricity, Magnetism, and Waves ($\times 1$)

DAVIDSON COLLEGE **2022 - 2025**

- PHY 125, General Physics with Calculus I: Studio
  Fall 2024: 31 Students
  Fall 2023: 35 Students
  Fall 2022: 33 Students
- PHY 225, General Physics II: Studio
  Spring 2025: 35 Students
  Spring 2024: 33 Students
  Spring 2023: 26 Students
- PHY 330, Classical Mechanics
  Fall 2024: 21 Students
  Fall 2023: 14 Students
  Fall 2022: 12 Students

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL **2015 - 2022**

- PHYS 281L, Experimental Techniques in Physics
  Fall 2021, 29 Students
  Spring 2021, 12 Students
  Fall 2020, 23 Students

Summer 2020, 16 Students
Spring 2020, 23 Students
Fall 2019, 26 Students
Summer 2019, 8 Students

- PHYS 114, General Physics I
  Summer 2018, 26 Students
- Studio Sections Taught as a Graduate Teaching Assistant
  PHYS 118, Mechanics and Relativity ($\times 3$)
  PHYS 119, Electromagnetism and Quanta ($\times 2$)

Honors and Awards

Best Paper Award **March 2025**
North Carolina Section of the American Association of Physics Teachers

Exceptional Teaching Award for Visiting Faculty **May 2023**
Davidson College, Davidson, NC

- This award recognizes visiting faculty for "exceptional teaching, demonstrated by an exceptional commitment to their students and their discipline, ability to create and foster a lively and engaging classroom environment, and a tendency to inspire students and serve as a model for their colleagues."

Tanner Award for Excellence in Undergraduate Teaching **April 2021**
The University of North Carolina at Chapel Hill, Chapel Hill, NC

- Highest university-wide teaching honor for graduate students at UNC

Outstanding Graduate Teaching Assistant Award ($2\times$) **May 2016, May 2020**
UNC-Chapel Hill, Dept. of Physics and Astronomy, Chapel Hill, NC

Hamilton Award for Summer Research Funding ($2\times$) **April 2019, Feb. 2020**
UNC-Chapel Hill, Dept. of Physics and Astronomy, Chapel Hill, NC

Best Graduate Paper Award **Nov. 2019**
North Carolina Section of the American Association of Physics Teachers

"Distinction" for Senior Thesis Presentation **June 2015**
Carleton College, Northfield, MN

Advising and Mentoring Experience

Lafayette College **2025 - Present**

- Independent Research Students (During Academic Term)
  Nihan Cedimagar (Physics, Theater, '27)
  Jaden Cohen, (electrical & computer engineering, physics minor, '28)

Davidson College **2023 - 2025**

- Honors Thesis Students
  Juan Camilo Pérez Góngora, (physics, mathematics, '25)
- Summer Research Students
  Jacquelline Nyakunu, (physics, pre-med, '26)
  Griffin Whalen, (physics, '25)
  Christopher Piatnichouk, (physics, chemistry, pre-med, '26)
- Independent Research Students (During Academic Term)
  Benjamin Atherton, (physics, '26)
  Benjamin Grear, (chemistry, pre-med, '26)

Henry Russell, (physics, '26)
Niels van Duijnhoven, (physics, '25)
Chenlu Qin, (chemistry, mathematics, '23)

Publications

**Indicates student co-author*

B. E. Levy, A. N. Kuchera, S. N. Cudo, and M. Belloni. *"A Hands-On Activity for Introducing Gauss's Law."* The Physics Teacher, 63, 720–722 (2025).

J. Nyakunu*, C. T. Piatnichouk*, H. C. Russell*, N. J. van Duijnhoven*, and B. E. Levy. *"A Finite Element Analysis Model for Magnetomotive Ultrasound Elastometry Magnet Design with Experimental Validation."* Biomedical Physics & Engineering Express, 11, 025048 (2025).

B. E. Levy and A. L. Oldenburg. *"Elastometry of Clot Phantoms via Magnetomotive Ultrasound Based Resonant Acoustic Spectroscopy."* Physics in Medicine and Biology, 67, 155010 (2022).

B. E. Levy and A. L. Oldenburg. *"Single Magnetic Particle Motion in Magnetomotive Ultrasound: An Analytical Model and Experimental Validation."* IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 68(8), 2635-2644 (2021).

D. Thapa, B. E. Levy, D. L. Marks, and A. L. Oldenburg. *"Inversion of Displacement Fields to Quantify the Magnetic Particle Distribution in Homogeneous Elastic Media from Magnetomotive Ultrasound."* Physics in Medicine and Biology, 64(12), 125019 (2019).

B. E. Levy, M. M. Hossain, J. M. Sierchio, D. Thapa, C. M. Gallippi, and A. L. Oldenburg. *"Effect of Model Thrombus Volume and Elastic Modulus on Magnetomotive Ultrasound Signal under Pulsatile Flow."* IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 65(8), 1380-1388 (2018).

M. M. Hossain, B. E. Levy, D. Thapa, A. L. Oldenburg, and C. M. Gallippi. *"Blind Source Separation Based Motion Detector for Imaging Super-Paramagnetic Iron Oxide (SPIO) Particles in Magnetomotive Ultrasound Imaging."* IEEE Transactions on Medical Imaging, 37(10), 2356-2366 (2018).

Presentations and Posters

Invited

- B. E. Levy. "Toward Measuring the Stiffness of Blood Clots Using Magnetomotive Ultrasound." *University of South Carolina, Department of Physics and Astronomy Colloquium* (April, 2024).

Contributed

**Indicates student co-author*

- B. E. Levy. "Empowering Students via Self-Graded Homework: Less Stress, More Learning, and a Reason for Optimism in the Age of AI!" *American Association of Physics Teachers Winter Meeting* (2026).
- B. E. Levy. "Homework Self-Grading: Higher Exam Scores, Lower Stress, and Hope for Humanity!" *North Carolina Section of the American Association of Physics Teachers, Spring Meeting* (2025).
- B. E. Levy and C. Piatnichouk*. "Simulations of Resonating Blood Clots for a Classical Mechanics Course: Insights from the Classroom." *North Carolina Section of the*

American Association of Physics Teachers, Spring Meeting (2024).

- B. E. Levy, C. Qin*, C. Piatnichouk*, J. C. Pérez Góngora*, and G. Whalen*. "Finite Element Simulations of Resonating Blood Clots for a Classical Mechanics Course." *American Association of Physics Teachers Summer Meeting* (2023).
- B. E. Levy, M. Sankaran*, S. Brogan, R. V. F. Janssens, and D. L. Deardorff. "Less is More: At-Home Interferometry in an Undergraduate Laboratory Course." *American Association of Physics Teachers Summer Meeting* (2021).
- J. Weinberg-Wolf, D. L. Deardorff, and B. E. Levy. "Meeting Laboratory Learning Objectives in a Remote Instruction Environment." *American Physical Society April Meeting* (2021).
- B. E. Levy and A. L. Oldenburg. "Toward Contrast-Enhanced Imaging and Elastography of Thrombosis Models via Magnetomotive Ultrasound." *UNC Blood Research Center Seminar Series* (2020).
- B. E. Levy. "Active Learning Approach for Teaching the Guide to the Expression of Uncertainty in Measurement (GUM)." *North Carolina Section of the American Association of Physics Teachers, Fall Meeting* (2019). *Received Best Graduate Paper Award.*
- B. E. Levy, D. Thapa, and A. L. Oldenburg. "Toward an Analytical Model of Magnetomotive Ultrasound (MMUS) Signal Generation." *IEEE International Ultrasonics Symposium* (2019).
- B. E. Levy, M. M. Hossain, C. M. Gallippi, and A. L. Oldenburg. "Magnetomotive Ultrasound Imaging Under Pulsatile Flow using Super-Paramagnetic Iron Oxide as a Contrast Agent." *Frontiers in Biomagnetic Particles* (2017).

External Talks and Posters by Students Mentored

**Indicates student co-author*

- J. Nyakunu*, and B. E. Levy. "Increasing Magnetomotive Ultrasound Force using Permanent Magnets: A Finite Element Analysis Study." *Southeastern Section of the APS Annual Meeting* (2024).
- H. Russell*, N. van Duijnhoven*, and B. E. Levy. "Finite Element Analysis for Magnetomotive Ultrasound Magnet Optimization." *North Carolina Section of the American Association of Physics Teachers, Spring Meeting* (2024).
- C. Piatnichouk*, B. Grear*, and B. E. Levy. "Analytical and Experimental Validation of Finite Element Magnet Simulations for a New Medical Imaging Modality." *North Carolina Section of the American Association of Physics Teachers, Spring Meeting* (2024).
- G. Whalen*, J. C. Pérez Góngora*, C. Piatnichouk*, C. Qin*, and B. E. Levy. "Validation of Computational Blood Clot Elastometry Model Through Design and Testing of Magnetomotive Ultrasound Tissue-Mimicking Phantoms." *American Physical Society March Meeting* (2024).
- J. C. Pérez Góngora*, G. Whalen*, C. Piatnichouk*, C. Qin*, and B. E. Levy. "Design and Validation of Computational Blood Clot Elastometry Model for Use with Magnetomotive Ultrasound." *Southeastern Section of the APS Annual Meeting* (2023).
- C. Piatnichouk*, C. Qin*, J. C. Pérez Góngora*, G. Whalen*, and B. E. Levy. "Blood Clots in a Classical Mechanics Course: Simulating Driven, Damped Oscillators Using Finite Element Analysis." *Southeastern Section of the APS Annual Meeting* (2023).

Internal Talks and Posters by Students Mentored

- J. C. Pérez Góngora. "Incorporating Joule Heating in a Finite Element Analysis Model for Magnetomotive Ultrasound Magnet Design." *Davidson College Physics Department Honors Talk* (2025).
- B. Atherton and C. Piatnichouk. "Enhanced Force Output in Magnetomotive Ultra-

sound via Novel Magnet Core Design." *Davidson College Verna Miller Case Research and Creative Works Symposium* (2025).

- J. Nyakunu. "Increasing Magnetomotive Ultrasound Force using Permanent Magnets: a Finite Element Analysis Study." *Davidson College Fall Research Symposium* (2024).
- C. Piatnichouk and B. Grear. "Analytical and Experimental Validation of Finite Element Magnet Simulations for a New Medical Imaging Modality." *Davidson College Verna Miller Case Research and Creative Works Symposium* (2024).
- H. Russell and N. van Duijnhoven. "Finite Element Analysis for Magnetomotive Ultrasound Magnet Optimization." *Davidson College Verna Miller Case Research and Creative Works Symposium* (2024).
- G. Whalen. "Validation of Computational Blood Clot Elastometry Model Through Design and Testing of Magnetomotive Ultrasound Tissue-Mimicking Phantoms." *Davidson College Fall Research Symposium* (2023).
- J. C. Pérez Góngora."Design of Computational Blood Clot Elastometry Model Using Finite Element Analysis for Use With Magnetomotive Ultrasound." *Davidson College Fall Research Symposium* (2023).
- C. Piatnichouk. "Blood Clots in a Classical Mechanics Course: Simulating Driven, Damped Oscillators Using Finite Element Analysis." *Davidson College Fall Research Symposium* (2023).
- C. Qin. "COMSOL Multiphysics-Assisted Pedagogical Demonstrations of Resonance: Spring, Wineglass/Glass Sheet, and Model Blood Clot." *Davidson College Verna Miller Case Research and Creative Works Symposium* (2023).

Professional Service

Journal Referee

- Physics in Medicine and Biology ($\times 1$)
- Ultrasound in Medicine and Biology ($\times 2$)
- The Physics Teacher ($\times 1$)
- American Journal of Physics ($\times 1$)
- World Federation for Ultrasound in Medicine and Biology—Ultrasound Open ($\times 1$)
- Journal of Biomedical Optics ($\times 1$)

Institutional Service

Lafayette College **2025 - Present**

- Physics Department Library Liaison (2025 - Present)

Davidson College **2022 - 2025**

- Physics Department Visiting Faculty Search Committee Member (2025)

The University of North Carolina at Chapel Hill **2015 - 2022**

- University Teaching Award Selection Committee Member for the *J. Carlyle Sitterson Award for Teaching First-Year Students* (2021 - 2022)
- Graduate Studies and Affairs Committee Member (2017 - 2018)
- Graduate Student Pre-Candidacy Mentoring Team Leader (2016 - 2017)
- Prospective Graduate Student Visiting Days Coordinator (2016 - 2017)

DEI-Focused Seminars & Certifications

- **Safe Zone**: allyship training to support members of the LGBTQIA+ community

- **Haven**: allyship training to support those affected by sexual and interpersonal violence and/or stalking
- **Mental Health First Aider**: training for response strategies when someone is developing a mental health problem or experiencing a mental health crisis
- **Birds of a Feather**: dynamics of academic collaborations across identity differences
- **Confidence and Empowerment**: discussion of students' classroom experiences that foster or hinder confidence
- **Creating and Sustaining Belonging**: teaching practices to build a classroom that welcomes all students
- **Dimensions of Diversity**: discussion of identities and intersectionalities that can be overlooked in common DEI discourse