LAUREN E. ALTMAN

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EDUCATION AND EMPLOYMENT

University of Pennsylvania, Philadelphia, PA *January 2023 - Present*
Center for Soft and Living Matter Postdoctoral Fellow

New York University, New York, NY *September 2017 - August 2022*
PhD, Physics, Center for Soft Matter Research

Favful, Kuala Lumpur, Malaysia *January 2017 - April 2017*
Web Development Intern

Brown University, Providence, RI *September 2012 - May 2016*
Bachelor of Science with Honors, Mathematical Physics

PUBLICATIONS

Collective Hysteron Behavior in Nonlinear Flow Networks 2024
Lauren E. Altman, Nadia Awad, Miguel Ruiz-Garcia, Eleni Katifori. (In preparation)

Experimental Demonstration of Coupled Learning in Elastic Networks 2024
Lauren E. Altman, Menachem Stern, Andrea J. Liu, Douglas J. Durian.
Physical Review Applied, 22, 024053.

Anomalous Tumbling of Colloidal Ellipsoids in Poiseuille Flows 2023
Lauren E. Altman, Andrew Hollingsworth, David Grier. Physical Review E, 108, 034609.

Machine Learning Enables Precise Holographic Characterization of Colloidal Materials in Real Time 2023
Lauren E. Altman, David Grier. Soft Matter, 2023, 19, 3002-3014.

Holographic Analysis of Colloidal Spheres Sedimenting in Horizontal Slit Pores 2022
Lauren E. Altman, David Grier. Physical Review E, 106, 044605.

In-Line Holographic Microscopy with Model-Based Analysis 2022
Caroline Martin, Lauren E. Altman, Siddharth Rawat, Anna Wang,
David Grier, Vinothan Manoharan. Nature Review Methods Primers, 2, 82.

Holographic Tomography of Fractal Aggregates 2022
Rafe Abdulali, Lauren E. Altman, David Grier. Optics Express, 30(21), 38587-38595.

Holographic Characterization and Tracking of Colloidal Dimers in the Effective-Sphere Approximation 2021
Lauren E. Altman, Rushna Quddus, Fook Cheong, David Grier. Soft Matter, 17(10), 2695-2703.

HolographicDiagnostics: Automated Virus Binding Assay 2020
Rushna Quddus, Kaitlynn Snyder, Lauren E. Altman, Laura Phillips,
David Grier, Andrew Hollingsworth, Kent Kirshenbaum. Protocols.io.
dx.doi.org/10.17504/protocols.io.bkpgkvjw

Interpreting Holographic Molecular Binding Assays with Effective Medium Theory 2020
Lauren E. Altman, David Grier. Biomedical Optics Express, 11(9), 5225-5236.

CATCH: Characterizing and Tracking Colloids Holographically using Deep Convolutional Neural Networks 2020
Lauren E. Altman, David Grier. Journal of Physical Chemistry B, 124(9), 1602-1610.

Three Dimensional Integrated Circuits Bonded to Sensors 2015
Ray Yarema, Thomas Zimmerman, Lauren E. Altman, Ronald Lipton, et. al.
PoS (Vertex2014) 045.

PRESENTATIONS

Holographic Microscopy: Using Lasers to Study the Microscopic World 2024
Lauren E. Altman (UPenn)
Stoney's British Pub, Wilmington, DE (Public Lecture)

Tuning Nonlinear Networks to Facilitate Complex Behaviors 2024
Lauren E. Altman (UPenn)
University of Rochester (Invited Speaker)

Tuning Nonlinear Networks to Facilitate Complex Behaviors 2024
Lauren E. Altman (UPenn)
Syracuse University (Invited Speaker)

Holography and Effective Medium Theory as a Tool for Probing Complex Colloidal Systems 2024
Lauren E. Altman (UPenn), Ran Tao (UPenn), David Grier (NYU), Arnold Mathijssen (UPenn)
Summer school on Soft Matter Systems: from fundamentals to Foods

Tunable Elastic Materials that Self-Adjust via Local Learning Rules 2024
Lauren E. Altman (UPenn), Doug Durian (UPenn), Menachem Stern (UPenn), Andrea Liu (UPenn)
APS March Meeting 2024

Tunable Elastic Materials that Self-Adjust via Local Learning Rules 2024
Lauren E. Altman (UPenn), Doug Durian (UPenn), Menachem Stern (UPenn), Andrea Liu (UPenn)
Computing in Physical Systems, Aspen Winter Conference. (Invited Speaker)

Experimental Demonstration of Coupled Learning In Elastic Materials 2023
Lauren E. Altman (UPenn), Doug Durian (UPenn), Menachem Stern (UPenn), Andrea Liu (UPenn)
Rising Stars in Soft and Biological Matter Symposium (Invited Speaker)

Demonstration of Coupled Learning In Elastic Metamaterials 2023
Lauren E. Altman (UPenn), Doug Durian (UPenn), Menachem Stern (UPenn), Andrea Liu (UPenn), Shivangi Misra (UPenn), Cynthia Sung (UPenn)
ICAM Complex Mechanical Metamaterials Workshop, Ann Arbor 2023

Colloidal Gymnastics: Understanding the Jeffery Orbits of Axisymmetric Particles With Holographic Microscopy and Effective Medium Theory 2023
Lauren Altman (NYU), David Grier (NYU)
Rising Star Workshop, UC Berkeley 2023 (Invited Speaker)

Holographic Analysis of Colloidal Dimers and Ellipsoids Using Effective Medium Theory 2022
Lauren Altman (NYU), David Grier (NYU), Rushna Quddus (NYU), Fook Cheong (Spheryx), ACS Fall Meeting 2022 (Invited Speaker)

Holographic Tracking of Jeffery Orbits in Colloidal Dimers and Ellipsoids 2022
Lauren Altman (NYU), David Grier (NYU), Rushna Quddus (NYU), Fook Cheong (Spheryx), APS March Meeting 2022, Volume 27, Number 11

Unsteady Sedimentation of a Colloidal Sphere in a Horizontal Channel 2020
Lauren Altman (NYU), David Grier (NYU),
APS Virtual March Meeting 2020, Volume 65, Number 1

End-to-End Characterization of Colloidal Particles through Holographic Microscopy and Deep Convolutional Neural Networks 2019
Lauren Altman (NYU), David Grier (NYU), Mark D Hannel II (NYU),
APS March Meeting 2019, Volume 64, Number 2

AWARDS AND ACCOMPLISHMENTS

Center for Soft and Living Matter Postdoctoral Fellow 2024
University of Pennsylvania

Rising Stars in Soft and Biological Matter 2023
U Chicago, UC San Diego

Diversity and Inclusion Award Finalist 2023
APS Forum for Early Career Scientists

Rising Stars in Physics 2023
UC Berkeley

Holographic Analysis of Colloidal Spheres Sedimenting in Horizontal Slit Pores 2022
Lauren Altman and David Grier. New York University.
(United States Provisional Patent Application No. 63/415,584)

Outstanding Graduate Student Instructor Award 2022
New York University

APS Division of Soft Matter Student Travel Award 2022
APS March Meeting

Automated Holographic Video Microscopy Assay 2021
David G. Grier, Fook Chiong Cheong, Kaitlynn Snyder,
Rushna Quaddus, Lauren E Altman, Kent Kirshenbaum. NYU and Spheryx.
(United States Patent Application 20210279876)

XPRIZE Rapid Covid Testing Semifinalist 2020
Kaitlynn Snyder, Rushna Quddus, Lauren Altman, Kent Kirshenbaum,
Fook Cheong, Laura Phillips, Andrew Hollingsworth, David Grier. NYU and Spheryx

R. Bruce Lindsay Prize for Excellence in Physics 2016
Brown University

APPOINTMENTS AND MEMBERSHIP

Founding Member
Graduate Physics Organization for Research, Culture, and Education 2019 - 2022
New York University

Member
Union for Graduate Employees 2019 - 2022
New York University

Journal Referee 2021
Applied Optics, Nature Photonics

Graduate Representative
Equity and Inclusion Committee 2020 - 2021
New York University

Executive Board Member
Women in Physics 2019 - 2020
New York University

Member
Physics Women in Science and Engineering 2014 - 2016
Brown University

TEACHING, MENTORING, AND OUTREACH

Science Café 2024
Stoney's British Pub, Wilmington, DE

· Public Lecture: "Holographic Microscopy: Using Lasers to Study the Microscopic World"

Food Science with Lauren 2024
Public Outreach in Physics at U Penn, Philadelphia, PA

· Series of outreach videos educating about physics and chemistry using demonstrations in cooking and baking

Philly Materials Science and Engineering Day 2024
Drexel University, Philadelphia, PA

· Outreach demonstrations for K-12 on elastic learning materials using rubber bands

Mentor 2017 - 2024
UPenn, Philadelphia, PA and NYU, New York, NY

· High school, Undergraduate, and Graduate students

Science After Hours 2023
Franklin Institute, Philadelphia, PA

· Outreach demonstrations

Adjunct Instructor 2019 - 2022
NYU, New York, NY

· Graduate Thermodynamics and Statistical Mechanics
· Undergraduate General Physics II Lab
· Undergraduate Dynamics

Scientific Frontiers Program 2017 - 2022
NYU, New York, NY

· Outreach workshops and lecturing

NYU Physics Graduate Mentor Program 2020
NYU, New York, NY

· Matched with a first-year graduate mentee

Tutor 2016
Summit Educational Group, New Canaan, CT
Varsity Tutors, Westchester, NY

· ACT Math and Science, AP Physics, IB Physics,
Honors Physics, Undergraduate Physics, Algebra, Geometry, TABE Math

PANELS

How to Navigate PhD Life 2023
Diversity Equity Engagement at Penn in STEM

DSOFT March Meeting Panel 2023
APS Division of Soft Matter

Open House Graduate Student Panel 2020
NYU

LGBT+ In Research Panel 2018
NYU

RESEARCH EXPERIENCE

Postdoctoral Research, University of Pennsylvania, Philadelphia, PA 2023 - Present
Research Fellow *Advisor: Douglas Durian*

Graduate Research, NYU, New York, NY 2017 - 2022
Research Student *Advisor: David Grier*

UTRA Program, Brown University, Providence, RI 2015 - 2016
Research Student *Advisor: Marcus Spradlin*

Fermi National Accelerator Laboratory, Batavia, IL 2014
Research Student *Advisors: Meenakshi Narain, Ronald Lipton*

Lamont Doherty Earth Observatory, Palisades, NY 2013
Research Student *Advisor: Robin Bell*

Acknowledged in: "Deformation, Warming and Softening of Greenlands Ice by Refreezing Meltwater." Nature Geosci 7, 497502 (2014).

TECHNICAL SKILLS

GitHub	https://github.com/laltman2
Programming	Python, C++, Javascript, MatLab, Mathematica, LaTeX, LabView, Arduino, Altium
Machine Learning	PyTorch, Tensorflow, Keras
Experimental	Video Microscopy, Optical Trapping, Holographic Particle Characterization, PCB design, Circuitry, Soft Robotics