Batia
Friedman-Shaw

Education

2023 – Now   **Perimeter Institute/University of Waterloo**, Waterloo, ON, Canada
Ph.D. Student, Advisors: *Dr. Katherine Mack and Dr. Matthew C. Johnson*
Research: Dark Energy/Cosmology

2022 – 2023   **Perimeter Institute/University of Waterloo, PSI Program**, Waterloo, ON, Canada
M.Sc., Advisor: *Professor Robert C. Myers*
Research: Quantum Gravity

2018 – 2022   **Brown University**, Providence, RI, United States
Sc. B., Advisor: *Professor Stephon Alexander*
Research: Theoretical Dark Energy, Machine Learning

Research & Projects

2024 – Now   **Theoretical Dark Energy Research**, *Advisors: Dr. Matthew C. Johnson, Dr. Katherine Mack*, Examining consequences of sub-horizon scale vacuum decay bubbles on local observables.

2023 – 2024   **Data Driven Dark Energy Research**, *Advisor: Professor Will Percival*, Tested validity of Baryon Acoustic Oscillation (BAO) analyses in the Dark Energy Spectroscopic Instrument (DESI) Survey.

2023 – 2024   **Galaxy Survey Analysis Research**, *Advisor: Professor Niayesh Afshordi*, Examining how gravitationally influenced galaxy velocities affect galaxy target selection and subsequent cosmological observables.

2022 – 2023   **Quantum Gravity Research**, *Advisor: Professor Robert C. Myers*, Explored scattering around holographic black holes.

2022   **Physics Hackathon Creation**, *Project Leader: Professor Richard Gaitskell*, Creating a coding competition to expose Brown University physics concentrators to machine learning methods.

2021 – 2022   **Theoretical Dark Energy Research**, *Advisor: Professor Stephon Alexander*, Examining whether a newly proposed model of dark matter and dark energy fits with well-established cosmology.

2020 – 2021   **Physics and Machine Learning Project**, *Advisor: Professor Stephon Alexander*, Developed a primer on machine learning to help researchers apply ML in all fields of physical science.

2021 – 2022 **Quantum Field Theory Renormalization Research**, *Advisor: Professor Jeremy Kahn*, Explored the use of analytic continuation to define specific renormalization methods more rigorously.

2019 – 2020 **Quantum Chemistry Computational Research**, *Advisor: Professor Brenda Rubenstein*, Developed software used to determine Hamiltonians and their approximate associated energy for arbitrary 2D Ising models.

Papers

Holographic Scattering and Non-Minimal RT Surfaces
By Jacqueline Caminiti, Batia Friedman-Shaw, Alex May, Robert C. Myers, Olga Papadoulaki
authorship is listed alphabetically
arXiv:2404.15400 [hep-th]

The Physics of Machine Learning: An Intuitive Introduction for the Physical Scientist
By Stephon Alexander, Sarah Bawabe, Batia Friedman-Shaw, Michael Toomey
authorship is listed alphabetically
arXiv:2112.00851 [cond–mat.dis–nn]

Teaching

Winter 2024 **Graduate Teaching Assistant**, *Quantum Fields and Strings*, Perimeter Institute.
Fall 2023 **Graduate Teaching Assistant**, *Phys 111*, Physics 1, University of Waterloo.
2019 – 2022 **Hebrew & Religious Studies Teacher**, Temple Beth El, Providence, RI.
Fall 2021 **Grader**, *Math 180*, Multivariable Calculus, Brown University.
Summer 2021 **Teaching Assistant**, *Math 0180*, Multivariable Calculus, Brown University.
Summer 2021 **Grader**, Pre-College Quantum Mechanics, Brown University.
Spring 2021 **Teaching Assistant**, *Phys 0070*, Analytical Mechanics, Brown University.
Fall 2020 **Teaching Assistant**, *Phys 1420*, Quantum B, Brown University.

Honors & Awards

2023 **Perimeter Institute Residency Graduate Scholarship**, *Perimeter Institute*.
2022 **Perimeter Scholars International Award**, *Perimeter Institute*.
2022 **Magna Cum Laude**, *Brown University*, (Highest Distinction at Brown).
2022 **Honors in Physics**, *Brown University Physics Department*.
2022 **Sigma Xi Honors Society**.
2021 **Sigma Pi Sigma Honors Society**, *Brown University Society of Physics Students*.
2019 **UTRA**, *Brown University Teaching and Research Award*.

Presentations

1. *Impact of Peculiar Velocities on Color Selection of Emission Line Galaxies*, Relativistic Effects and Novel Observables in Cosmology, University of Geneva (2024)
2. *Testing BAO Fitting on a Range of Cosmologies*, Canadian Astronomical Society (CASCA) Meeting, Toronto (2024)
3. *Doppler Effect in Galaxy Surveys*, Women in Physics Canada Conference, University of Manitoba (2023)
4. *Doppler Effect in Galaxy Surveys*, PSI Winter School Conference, Perimeter Institute (2023)
5. *Identity Theft: The story of how Dark Energy Masqueraded as Matter and Radiation*, Conference for Undergraduate Women in Physics, Brown University (2022)

6. *Identity Theft: The story of how Dark Energy Masqueraded as Matter and Radiation*, Society of Physics Students Chapter Meeting, Brown University (2022)
7. *Identity Theft: The story of how Dark Energy Masqueraded as Matter and Radiation*, Brown Physics Departmental Undergraduate Group 'Scialogue' Presentation , Brown University (2021)
8. *Making Waves: Approximating Solutions to the Hubbard Model Using the Power Method*, Brown Physics Departmental Undergraduate Group 'Scialogue' Presentation, Brown University (2020)
9. *Making Waves: Approximating Solutions to the Hubbard Model Using the Power Method*, Brown University Summer Research Symposium, Brown University (2019)

Organizations & Outreach

2023 – Now	**Waterloo Center for Astrophysics (WCA) Outreach**, Partake in organizing Astronomy on Tap, Kitchener Public Library Talks, and Travelling Planetarium Shows.
2023 – Now	**Member**, *University of Waterloo Physics Graduate Student Association (GSA)*.
2018 – 2022	**Member**, *Brown Physics Women in Science and Engineering (WiSE) Club*.
2019	**Coordinator**, *Brown Physics Departmental Undergraduate Group*.
2018 – 2022	**Member**, *Brown Physics Departmental Undergraduate Group*.
2017 – 2018	**Head Science Tutor Coordinator**, *Berkeley Preparatory School*.
2015 – 2018	**Science Tutor**, *Berkeley Preparatory School*.

Skills

Computer	Python, Julia, LaTeX, Mathematica, MATLAB, Maple, Markdown, HTML & CSS, Java, Adobe Illustrator, Inkscape, Photoshop
Personal	Communication, Creativity, Teaching, Lesson Planning, Perseverance, Problem Solving