Nick Reilly

PhD Candidate - Physics and Astronomy

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Education

University of Rochester *Rochester, NY*

M.A. in Physics and Astronomy *2015 - Current*

Expected PhD. in Physics and Astronomy in June 2024

Bowling Green State University *Bowling Green, OH*

B.S. in Physics, Graduated Cum Laude *2009 - 2013*

Research

Infrared Detectors for Space Astrophysics-University of Rochester *Rochester, NY*

Graduate Research Assistant *Dec 2019 - Present*

- Wrote an analysis pipeline for calibration and analysis of detectors for NEO Surveyor.
- Modified an existing routine for Modulation Transfer Function measurements for HgCdTe devices, and validated with standard datasets.
- Presented updates as needed to the entire detector working group for the Near-Earth Object Surveyor Mission.
- Installed Hawaii-XRG HgCdTe detectors into cryogenic vacuum test dewars.
- Managed cooldowns using liquid and solid nitrogen, and liquid helium.
- Maintained and fixed laboratory equipment when required.
- Designed and fabricated custom equipment using the in house machine shop and 3D printers.

Oakes Lab-University of Rochester *Rochester, NY*

Graduate Research Assistant *Jan 2017 - Dec 2019*

- Developed cell motility assay specific for CD4+ T Cells to investigate amoeboid migration mecahnics.
- Built an image analysis algorithm to track cells and calculate multiple migration metrics for multi-field, timelapse images.
- Tested modified influenza viruses to and their influence of the traction stresses generated by colonies of cells throughout duration of infection.
- Completed biophysical assays with collaborators, requiring implementation of traction force microscopy, micropatterning, and photoablation.

Guo Lab-University of Rochester *Rochester, NY*

Graduate Research Assistant *Apr 2016 - Dec 2016*

- Collaborated in the design process for a new clean room facility.
- Worked with ultrashort (fs) pulsed lasers for molecule ionization experiments.
- Supported other students and postdocs on surface experiments, including hydrophobic and hydrophilic metals and plastics without coatings.

Sun Group-Bowling Green State University *Bowling Green, OH*

Undergraduate Research Assistant *Jan 2010 - Dec 2013*

- Assisted construction of the Sun lab, calibrating optical equipment, electromagnets, and a chemical synthesis bench for nanostructure production.
- Made Ultra-small Lead Sulfide Quantum dots using low cost wet chemistry techniques.
- Participated in the production of Lead Sulfide nanosheet synthesis, and their characterization.
- Developed a procedure for a dip coating machine that efficiently made thin films of quantum dots and nanosheets.

Teaching

University of Rochester - Dept. of Physics and Astronomy *Rochester, NY*

Teaching Assistant *Aug 2015 - May 2016*

- Lead workshops, graded, and maintained office hours for undergraduate mechanics for non-physics majors.

Professional

Newell Rubbermaid - Writing Division *Downers Grove, IL*

Laboratory Technician *Feb 2014 - Apr 2015*

- Provided primary support for safety and heavy metal analysis across multiple product lines.
- Operated many custom writing system testing equipment, including write test machines, X-Ray, X-Ray Fluorometer, Rheometer, Abrator, Spectrodensiometer, among many others.
- Modified existing standard operating procedures to include new industrial testing and safety standards.
- Started an initiative to automate some basic testing using LabView.

ASL Audio *Bowling Green, OH*

Audio Engineer *May 2011 - Dec 2013*

- Assembled PA systems for all size events, including events through Bowling Green State University, town festivals, sporting events, and philanthropic events
- Ran the board for many different types of production events
- Experienced in performance aspect including artist for a large campus event

Academic Service

Diversity, Equity, and Inclusion Committee *Dept. of Physics and Astronomy*

Student Member *Jun 2020 - Present*

- Worked with fellow students and faculty to create a new DEI committee in the Physics and Astronomy Department.
- Collaborated with peers to institute new policies to promote DEI within the department.
- Pushed the APS Bridge implementation at the University of Rochester to be more supportive of their students, and advocated for an increase in number of students per year admitted.

Rochester Museum and Science Center *Rochester, NY*

Ask-It Volunteer *Apr 2021 - Present*

- Assisted with day-to-day activities to keep the museum functional.
- Developed new presentations for the Science on the Sphere for use during their daily operations.
- Supported the Climate Action Days initiative by writing and presenting a program covering climate change and technology development supporting a cooler Earth.
- Presented at several of the "After Dark" events, primarily for adults, to discuss topics such as the JWST launch, the eclipse, climate change, and the search for life.

Skills

Laboratory	Cryogen Transfer, Machining, 3D Modeling, Cell Culture, Wet Lab Chemistry, Microscopy, Basic electronics
Programming Languages	Python, Mathematica, Matlab, LaTeX
Data Processing	Infrared images, fluorescent microscopy
Design	Fusion360, OnShape, Light Machining
Operating Systems	Linux (Ubuntu, Debian, etc), MacOS, Windows
Scuba Diving	Open Water Certification- 40+ hours underwater

Honors & Awards

2017	**Helmsley Fellowship**, Award to attend Quantitative Imaging and Analysis Course	*CSHL,NY*
2013	**J. Robert & G. Overman Scholarship**, Outstanding Senior in Math or Physics	*Bowling Green, OH*
2009	**Sidney A. Ribeau President's Leadership Academy**, Four year leadership development scholarship	*Bowling Green, OH*
2011	**Timothy F. Smith Scholarship-Outstanding Greek Man of the Year**, Applauding Excellence Ceremony	*Bowling Green, OH*
2005	**Eagle Scout**, Advanced Rank in the Boy Scouts of America	*St. Charles, IL*

Relevant Publications

Nick Reilly, et al. "Measurement of the Modulation Transfer Function for the Mid-Infrared channel HgCdTe Detectors for the Near-Earth Object Surveyor Mission," *in preparation*

Nick Reilly, et al. "Testing results from pathfinder HgCdTe infrared detectors for the Near-Earth Object Surveyor mission," *Proc. SPIE, X-Ray, Optical, and Infrared Detectors for Astronomy X*, 121912A (29 August 2022); https://doi.org/10.1117/12.2629687

Zengilowski, Gregory R, Craig W McMurtry, Judith L Pipher, **Nick Reilly**, et al. "Modulation Transfer Function Measurements of HgCdTe Long Wavelength Infrared Arrays for the Near-Earth Object Surveyor." *Journal of Astronomical Telescopes, Instruments, and Systems 8* (2022): 23. https://doi.org/10.1117/1.jatis.8.1.016002.

Gregory R. Zengilowski, ...,**Nick Reilly**, et al. "Status update on the NEO surveyor detector development," *Proc. SPIE, X-Ray, Optical, and Infrared Detectors for Astronomy X*, 121911V (29 August 2022); https://doi.org/10.1117/12.2629660

Zengilowski, Gregory R., ..., **Nick Reilly**, et al. "Blooming in H2RG Arrays: Laboratory Measurements of a Second Brighter-Fatter Type Effect in HgCdTe Infrared Detectors." *Journal of Astronomical Telescopes, Instruments, and Systems 7*, no. 02 (June 4, 2021). https://doi.org/10.1117/1.jatis.7.2.026002.

Zengilowski, Greg, Craig W. McMurtry, Judith L. Pipher, **Nick Reilly**, et al. "Signal Nonlinearity Measurements and Corrections in MWIR and LWIR HgCdTe H2RG Arrays for NEO Surveyor." In *X-Ray, Optical, and Infrared Detectors for Astronomy IX*, edited by Andrew D. Holland and James Beletic, 123. Online Only, United States: SPIE, 2020. https://doi.org/10.1117/12.2563138.

Additional Publications

SR Barger, **NS Reilly**, et al. (2019). Membrane-cytoskeletal crosstalk mediated by myosin-I regulates adhesion turnover during phagocytosis. *Nature Communications*. DOI:10.1038/s41467-019-09104-1

EC Reilly, KL Emo, PM Buckley, **NS Reilly**, et al. (Submitted 2019). TRM Integrins CD103 and CD49a Differentially Support Adherence and Motility After Resolution of Influenza Virus Infection.

L Rathbun, E Colicino, S Coyne, **NS Reilly**, et al. (Submitted 2019). Cytokinetic bridge triggers *de novo* lumen formation *in vivo*.

DJ Fowell, NRJ Fernandes, **NS Reilly**, et al. (Submitted 2019) Fibronectin manipulation exacerbates T cell accumulation and enhances cytokine production in the inflamed skin.

NS Reilly, M Wehrung, RA O'Dell, L Sun (2014). Ultrasmall Colloidal PbS Quantum Dots. *Materials Chemistry and Physics*. DOI:10.1016/j.matchemphys.2014.04.026

GB Bhandari, K Subedi, Y He, Z Jiang, M Leopold, **NS Reilly**, et al. (2014) Thickness-controlled synthesis of colloidal PbS nanosheets and their thickness-dependent energy gaps. *Chemistry of Materials*. DOI:10.1021/cm502524z

Conference Presentations

SPIE Astronomical Telescopes + Instrumentation *Montreal, Canada*

Poster Presentation *Jul. 2022*

- Testing results from pathfinder HgCdTe infrared detectors for the Near-Earth Object Surveyor mission

Immunology Symposium *URMC- Rochester, NY*

Poster Presentation *November 2017*

- 2017- Quantifying LFA-1 Driven Surface Interaction Dynamics in Spreading CD8+ T Cells

Poster Presentation *San Diego, CA*

ASCB *2017-2018*

- 2017- Effect of influenza infection on epithelial monolayer integrity