Alexander Marshall | Physicist

4146 Stonecrest Drive, Apartment 301 – Burlington, North Carolina 27215
☎ (336) 618 9851 • ✉ al3xmarshall99@gmail.com
philosophiaephysica.org • Royster Doctoral Fellow at UNC Chapel Hill

HR Department
Corporation
123 Pleasant Lane
12345 City, State

May 14, 2025

To Whom it May Concern,

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Sincerely,

Alexander Marshall

Attached: Curriculum Vitæ

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Education

The University of North Carolina at Chapel Hill — **Chapel Hill, NC**
Doctorate of Philosophy in Physics — *2022-Present*
Royster Doctoral Fellow

The University of North Carolina at Chapel Hill — **Chapel Hill, NC**
Master's Degree in Physics — *2025*
Completed *en route* to PhD

Wake Forest University — **Winston-Salem, NC**
B.S. with Honors in Physics, B.A. in Philosophy, Minor in Math. — *2018-2022*
GPA 3.91 | *Summa Cum Laude* | Stamps Scholar

West Forsyth High School — **Clemmons, NC**
High School Diploma — *2014-2018*
Junior Marshall | Top 1% of graduating class

Academic Projects

Honors Thesis

Generating a 3-D Lattice of Photonic Spheres to Track Fluorescently Labelled Chromatin

Advisor: Dr. Keith Bonin

Comittee: Dr. Keith Bonin, Dr. George Holzwarth, Dr. Stephen Baker

Description: Wrote a custom iterative routine to generate, test, and analyze hundreds of thousands of phase settings on a spatial light modulator, implementing the correction method of Dholakia et al. (2017) Used this routine to create 3D lattice of photonic spheres to be used for tracking labelled chromatin in irradiated cells.

Masters Thesis

Ultra-fast Particle Tracking of Quantum Dots in Polyacrylamide Reveals Highly Anomalous, Non-Gaussian Diffusion on Short Timescales in Poroelastic Media.

Advisor: Richard Superfine

Thesis Comittee: Dr. Richard Superfine, Dr. C.A. Forrest, Dr. David Hill, Dr. Amy Oldenburg, Dr. Ehssan Nazockdast

Description: Tracked quantum dots undergoing dynamic diffusion in poroelastic media at ultra-high frame rates using highly-inclined swept tile light sheet fluorescent microscopy. Customized a unique microscope to enable this technique. Tracked particles and acheived the highest known temporal resolution sub-diffraction limit particle tracking of anomalous diffusion in poroelastic media.

Doctoral Thesis

Anomalous Diffusion in Poroelastic Media

Advisor: Richard Superfine

Thesis Comittee: Dr. Richard Superfine, Dr. C.A. Forrest, Dr. David Hill, Dr. Amy Oldenburg, Dr. Ehssan Nazockdast

Description: TBD.

Additional Research

Wake Forest Nanotech Center — **Winston-Salem**
Investigating Chalcogenide Crystals for Quantum Computing, David Carroll — *2021*

Wake Forest Medical School — **Winston-Salem**
Examining Neurochemical Addiction Mechanisms, Evgeny Budygin — *2019-2021*

Wake Forest Department of Anthropology — **Winston-Salem**
Cultural Impacts of Oenology in the Peleponnese, Karen Friederic — *2019*

Wake Forest Baptist Medical Center — **Winston-Salem**
Cancer and Postoperative Pain, Chris Peters — *2018*

Scholarships and Grants

2022-2027: **Royster Doctoral Fellowship.** Five-year fellowship awarded for academic merit.

2018-2022: **Stamps Scholarship.** Four-year full scholarship awarded for academic merit.

2019: **Wake Forest Scholars Travel Grant.** Awarded to fund anthropology project in Greece.

Publications

Technical skills

Advanced Coding: MATLAB, LabVIEW, Python, LaTeX

Scripting: μManager, ImageJ

Data Analysis: Particle Tracking, Image Analysis

Laboratory Skills: Transmission Microscopy, Fluorescent Microscopy, Light Sheet Fluorescent Microscopy, Total Internal Reflection Microscopy, Optics, 4F Laser Systems, Spatial Light Modulator, Remote Focusing, Particle Tracking, Machine Vision, Atomic Force Microscopy

Conference Poster Presentations

2019: Undergraduate Research Symposium (URECA) — *Wake Forest University*

2022: Wake Forest Physics Department Colloqium Presenter — *Wake Forest University*

2023-2025: Triangle Cytoskeleton Meeting — *Duke University*

2022-2027: UNC APS Department Colloqium — *UNC Chapel HIll*

2024: 8th Inernational Soft Matter Conference — *Raleigh, NC*

2025: Triangle Soft Matter Meeting — *Duke University*

Teaching and Mentorship

2021-Present: Several Semesters as a teachers assistant

2018-Present: Private tutoring

Anticipated Spring 2025: Instructor of Record for First Year Seminar

Lead a Team of Undergraduates: 2024-Present

Outreach

Wake Forest Baptist Medical Center **Winston-Salem**
Volunteer, over 400 accumulated hours *2015–2017*

UNC APS Department **Chapel Hill**
Open Flexure Microscope and Molecular Stamper *2023-Present*
Constructing low cost microscopes for use in low-resource environments. Project has recieved multiple awards, including the UNC MakerFest Entrepreneurship Award.

UNC Chapel Hill **Chapel Hill**
UNC ScienceFest *2023-Present*

Select Coursework

Unversity of North Carolina at Chapel Hill **Chapel Hill, NC**

Graduate Mathematical Methods	*2022*
Graduate Quantum Mechanics	*2022*
Graduate Classical Dynamics	*2022*
Graduate Statistical Mechanics	*2023*
Graduate Electromagnetism	*2022*
Fluid Dynamics	*2025*
Biophysics	*2025*
Optics	*2024*

Wake Forest Univeristy **Winston-Salem, NC**

2022	*Partial Differential Equations*
2022	*Quantum Computing*

References

Richard Superfine, PhD: superfine@unc.edu *Doctoral Advisor*
Keith Bonin, PhD: bonin@wfu.edu *Undergraduate Research Advisor*
Evgeny Budygin, PhD, PharmD: budygin@gmail.com *Undergraduate Research Mentor*

Languages

English: Fluent *Native Speaker*
Modern Greek: Intermediate *Conversational*
Classical Latin: Intermediate *Several years of formal instruction*

Interests

-Piano
-Chess
-Long-Distance Running
-Backpacking