Nicholas J. Dubicki

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Education

Ph.D. in Mathematical Sciences | 08/2024 | New Jersey Institute of Technology | Newark, NJ | GPA 4.0

M.S. in Applied Mathematics | 08/2019 | University of New Hampshire | Durham, NH

B.S. in Mechanical Engineering | 05/2017 | University of New Hampshire | Durham, NH
Magna Cum Laude

Employment

Senior Tutor | 01/2025 - Present | Prep Academy | Montclair, NJ
- One-on-one visits with clients for SAT prep, accelerated learning, and advanced coursework.

Adjunct Professor of Mathematics | 08/2024 - Present | New Jersey Institute of Technology | Newark, NJ
- Deliver instruction for Calculus II; managing 60 students; collaborate on curricula with multiple instructors.

Teaching and Research Assistant | 08/2019 - 08/2024 | New Jersey Institute of Technology | Newark, NJ
- Developed and implemented analytical and computational models of magnetic materials.
- Use Variational Analysis and GPU accelerated software to simulate the micromagnetic equations to discover new existence and collapse criteria of magnetic skyrmions in thin ferromagnetic systems.
- Equipped colleagues with essential tools by leading workshops on research software for PhD students.
- Chair organizing cmte. social/networking for PhDs/adjuncts across multiple academic departments.

Teaching and Research Assistant | 08/2017 - 08/2019 | University of New Hampshire | Durham, NH
- Integrated multiple heat transfer models, unit operations, and derived models for thermal properties of coolants to create scientific software to model vapor compression refrigeration cycles.
- Established feasibility of minimal weight refrigeration cycles under harsh weather operating conditions.
- Supervised instruction to students in ‘Experimental Methods / Data Analysis’ and ‘Thermal System Analysis’ by laboratory experiments and project based learning.

Research Support Associate | 05/2017 - 08/2017 | Massachusetts Institute of Technology | Cambridge, MA
- Analyzed and formulated acoustic wave equations to classify emergent structures for sonar reflection and transmission at a fluid-solid interface. Summarized and communicated findings to industry partners.

Research Interests

- Mathematical Physics, PDEs, Nonlinear Waves, Optimization
- Dynamics of Ferromagnetic Materials
- Thermal Systems, Fluid Dynamics, Geophysical Fluid Dynamics

Skills

MATLAB, C++, Python, SQL, Bash Scripting, Solidworks, OpenFOAM, mumax3, SLURM, OpenMP, Machine Learning, Data Science, Spanish (Conversational reading/writing/speaking)

Teaching Experience

Calculus I/II/III, Intro to Computing, Thermal System Analysis, Experimental methods and Data Analysis

Awards

- Daljit S. Ahluwalia Doctoral Fellowship, New Jersey Institute of Technology

Publications

1. N. J. Dubicki, *A Micromagnetic Study of Skyrmions in Thin-Film Multilayered Ferromagnetic Materials*, PhD thesis, New Jersey Institute of Technology, Newark, NJ, 2024.

2. N. J. Dubicki, *Use of Optimization Techniques in the Steady State Simulation of Vapor Compression Refrigeration Cycles*, Master's thesis, University of New Hampshire, Durham, NH, 2019.

Manuscripts in Preparation

3. A. Bernand-Mantel, N. J. Dubicki, C. B. Muratov, and T. M. Simon, *Stray field enabled skyrmions in ferromagnetic films of finite thickness*, 2025. Manuscript in Preparation.

4. A. Bernand-Mantel, N. J. Dubicki, C. B. Muratov, and V. V. Slastikov, *Bloch skyrmions in stray field coupled magnetic multilayers*, 2025. Manuscript in Preparation.

Seminars and Presentations

- Conference Poster. "Reevaluating Stability of Stray Field Driven Magnetic Skyrmions in Thin-Film Ferromagnetic Materials". Frontiers of Applied and Computational Mathematics. NJIT. Newark, NJ. May, 2023

- Department Talk. "Skyrmions in Ferromagnetic Thin-Film Bilayers". NJIT. Newark, NJ. July, 2022

- Department Talk. "Topologically Nontrivial Magnetic Structure in 2D". NJIT. Newark, NJ. July 2021

- Department Talk. "Electrostatics". NJIT. Newark, NJ. January, 2020

- Department Talk. "Inviscid and Irrotational Fluid Dynamics". NJIT. Newark, NJ. December, 2019

Professional References

Cyrill B. Muratov, cyrill.muratov@unipi.it
Professor of Mathematics, Università di Pisa
Primary Dissertation Advisor for my PhD at NJIT

Michael S. Siegel, michael.siegel@njit.edu
Professor of Mathematics, New Jersey Institute of Technology
Secondary Dissertation Advisor at NJIT

Christopher M. White, chris.white@unh.edu
Professor and Chair of Mechanical Engineering, University of New Hampshire
Primary Master's Thesis Advisor at UNH

Gregory P. Chini, greg.chini@unh.edu
Professor of Mechanical Engineering, University of New Hampshire
Chair of Integrated Applied Mathematics, University of New Hampshire
Master's Thesis Advisor at UNH