

# Nicholas J. Dubicki

Computational Scientist | Adjunct Professor  
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## Education

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**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

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**Senior Tutor of Mathematics** | 01/2025 - Present | Prep Academy | Montclair, NJ

- Teach all levels of math from basic to advanced.

**Adjunct Professor of Mathematics** | 08/2024 - Present | New Jersey Institute of Technology | Newark, NJ

- Teach college mathematics to STEM students and contribute to the design of academic curricula.

**Research and Teaching Assistant** | 08/2019 - 08/2024 | New Jersey Institute of Technology | Newark, NJ

- Developed and implemented analytical and high-performance numerical models of magnetic materials.
- Use Variational Analysis and GPU accelerated algorithms 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 Python, C, Numerical Methods, Data Visualization and High-Performance Computing for new PhD students.
- Was the chair of organizing committee for graduate student and adjunct professor association. Coordinated campus wide networking and informational events.

**Research and Teaching 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.
- Developed computational solvers based on optimization principles.
- Designed data processing algorithms for large-scale fluid dynamics simulations.
- 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 | MIT | Cambridge, MA

- Formulation and signal processing of acoustic wave equations to classify emergent structures for sonar reflection and transmission. Summarized and communicated findings to industry partners for real-world applications.

## Skills

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MATLAB, C++, Julia, Python (pandas, PyTorch, Keras, TensorFlow, matplotlib), SQL, Bash Scripting, Solidworks, OpenFOAM, COMSOL, mumax3, SLURM, OpenMP, CUDA, Concurrent Programming, High Performance Computing, Machine Learning, Data Science, Time Series Analysis, Spanish (Conversational reading/writing/speaking)

## Research Interests

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Mathematical Modeling, Algorithm Development, Mathematical Physics, PDEs, Optimization, Nonlinear Waves, Electromagnetism, Ferromagnetic Materials, Thermal Systems, Fluid Dynamics, Geophysics

## Teaching Experience

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

## Awards

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- Daljit S. Ahluwalia Doctoral Fellowship, New Jersey Institute of Technology, (Academic merit)

## Publications

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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

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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

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- 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

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**Professional references available upon request.**