Nathan Wassermann

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Education

Carnegie Mellon University, Pittsburgh, PA   *Fall 2022 – Spring 2027 (anticipated)*
Ph.D. in Mechanical Engineering, GPA: 4.0/4.0
Advisors: Sneha Narra and Alan McGaughey
Research Focus:
Physics-based modeling and experimental validation of mass transport phenomena in laser powder bed fusion (LPBF) of oxide dispersion-strengthened (ODS) alloys
Selected Coursework:
Computational Thermodynamics, Structure and Characterization of Materials, Molecular Simulation of Materials
Rensselaer Polytechnic Institute, Troy, NY   *Fall 2019 – Spring 2022*
Bachelor of Science in Mechanical Engineering, GPA: 4.0/4.0
Rensselaer Medal Scholarship

Selected Awards

National Defense Science & Engineering Graduate (NDSEG) Fellowship, Air Force Research Lab   *Spring 2024*
Awarded to top U.S. engineering Ph.D. students for research excellence and potential to advance national defense technologies
National Space Technology Graduate Research Opportunity (NSTGRO) Fellowship, NASA   *Spring 2024*
Supports graduate research aligned with NASA's strategic research objectives for space exploration and materials innovation
Graduate Research Fellowship Program (GRFP), National Science Foundation   *Spring 2024*
Recognizes outstanding graduate students in STEM disciplines demonstrating strong potential for high-impact research
Ricketts Prize, RPI   *Spring 2022*
Awarded to top graduating seniors in mechanical engineering for academic excellence and professional promise

Research Experience

Modeling Microstructural Evolution in Laser Powder Bed Fusion (LPBF), CMU   *Fall 2022 – Present*
- Develop multiphysics models of mass transport in LPBF of Ti-6Al-4V and ODS alloys
- Investigate oxide dissolution, particle dispersion, and pore evolution using thermodynamics, CFD, and LPBF experiments
- Coordinate experimental work across collaborators at CMU, NIST, and Texas A&M University using X-μCT, SAXS, and STEM characterization techniques

Publications
- N.A. Wassermann*, J.P. Miner*, J. Shao, et al., "Evolution of Powder-Entrapped Pores in Ti-6Al-4V Fabricated with Powder Bed Fusion-Laser Beam Process". *Additive Manufacturing* 109 (2025). https://doi.org/10.1016/j.addma.2025.104838
- N.A. Wassermann*, Y. Li, A.J. Myers, et al. "Limits of Dispersoid Size and Number Density in Oxide Dispersion Strengthened Alloys Fabricated with Powder Bed Fusion-Laser Beam." *Additive Manufacturing* 81 (2024). https://doi.org/10.1016/j.addma.2024.104022.

Conference Presentations

- *TMS 2025* – "Limits of Dispersoid Size and Number Density in ODS Alloys Fabricated with Laser Powder Bed Fusion" (Las Vegas, NV)
- *MS&T 2025* – "Formation and Elimination of Micron-Scale Oxide Inclusions in Ni-20Cr + Y_2O_3 ODS Alloy Fabricated with Laser Powder Bed Fusion" (Pittsburgh, PA)
- *MIT Fusion Workshop 2024* – "Limits of Dispersoid Size and Number Density in ODS Alloys Fabricated with Laser Powder Bed Fusion" (Remote)
- *SFF 2023* – "Effect of Solidification Conditions on the Evolution of Dispersoids in ODS Ni-20Cr Fabricated with LPBF" (Austin, TX)

Optimization of Luminescent Solar Concentrators, RPI   *Summer 2021*

- Deployed Monte Carlo ray-tracing code on RPI supercomputer cluster, achieving 28x performance improvement
- Authored documentation and workflow guidelines for supercomputer simulations

Teaching Experience

Artificial Intelligence and Machine Learning for Engineers, Teaching Assistant, CMU   *Spring 2025*

- Presented 1-hour lectures to small groups (10 students) on decision trees, support vector machines, and neural networks
- Designed lecture exercises and held weekly office hours

Fundamentals of Mechanical Engineering, Teaching Assistant, CMU   *Fall 2023*

- Led 2-hour lab sessions for two class sections (100+ students total) on CAD, Arduino programming, and FEA
- Provided individualized guidance on mechanical design projects

Physics II, Class Facilitator, RPI   *Spring 2020, 2021*

- Assisted with laboratory instruction in electromagnetism and circuit analysis

Modeling and Analysis of Uncertainty, Tutor, RPI   *Spring 2021*

- Conducted personalized tutoring sessions in probability and statistics.

Professional Experience

Ground Test Engineering Intern, Lockheed Martin RMS, Stratford, CT   *Fall 2021*

- Supported qualification testing for the S-92 helicopter and related variants
- Reviewed supplier test reports and ensured compliance with FAA and DoD requirements
- Provided structured feedback to external partners to improve documentation accuracy

Technical Skills

- Programming: MATLAB, Python (PyTorch, Scikit-Learn)
- Simulations: Thermo-Calc, Ansys Fluent
- Characterization: SEM/EDS, SAXS, Optical Microscopy, ImageJ
- Additive Manufacturing: LPBF, EB-PBF, and Binder Jet 3D Printing; Metallography, Materialise Magics, SolidWorks