

Nathan Wassermann

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Education

Carnegie Mellon University, Pittsburgh, PA

Fall 2022 – Spring 2027 (anticipated)

Ph.D. in Mechanical Engineering, GPA: 4.00/4.00

Advisors: Sneha Narra and Alan McGaughey

Research Objective:

I develop physics-based models to investigate mass transport in the laser powder bed fusion (LPBF) process, focusing on oxide dispersion-strengthened (ODS) alloys. Through a combination of modeling and experimentation, this project supports the development of processing strategies to predict and control the microstructure of printed parts.

Coursework:

- Computational Thermodynamics (Mat. Sci. & Eng.)
- Artificial Intelligence & Machine Learning for Engineers (Mech. Eng.)
- Computational Analysis of Transport Phenomena (Mech. Eng.)
- Molecular Simulation of Materials (Mech. Eng.)
- Structure and Characterization of Materials (Mat. Sci. & Eng.)
- Solidification Processing (Mat. Sci. & Eng.)
- Additive Manufacturing and Materials (Mat. Sci. & Eng.)
- Statistical Thermodynamics of Materials (Mat. Sci. & Eng.)

Rensselaer Polytechnic Institute, Troy, NY

Fall 2019 – Spring 2022

Bachelor of Science in Mechanical Engineering, GPA: 4.00/4.00

Research

Additive Manufacturing of ODS Alloys for Extreme Environments, CMU

Fall 2022 – Present

- Model-driven investigation of the mechanisms of oxide evolution during additive manufacturing to inform experimental processing strategies for oxide dispersion-strengthened (ODS) alloys
- Supported by NDSEG Fellowship (Air Force Research Lab, Materials for Extreme Environments)
- Collaborations with NASA and Texas A&M University
- 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>.
- N.A. Wassermann, A.J.H. McGaughey, S.P. Narra. “Limits of Dispersoid Size and Number Density in ODS Alloys Fabricated with Laser Powder Bed Fusion.” Oral presentation at TMS Annual Meeting, Las Vegas, NV, March 2025.
- N.A. Wassermann, A.J.H. McGaughey, S.P. Narra. “Formation and Elimination of Micron-Scale Oxide Inclusions in Ni-20Cr + Y₂O₃ ODS Alloy Fabricated with Laser Powder Bed Fusion”. Oral presentation at MS&T Conference, Pittsburgh, PA, October 2024.
- N.A. Wassermann, A.J.H. McGaughey, S.P. Narra. “Limits of Dispersoid Size and Number Density in ODS Alloys Fabricated with Laser Powder Bed Fusion.” Oral presentation at MIT Additive Manufacturing and Advanced Materials in Fusion Workshop, Cambridge, MA, May 2024.
- N.A. Wassermann, A.J.H. McGaughey, S.P. Narra. “Effect of Solidification Conditions on the Evolution of Dispersoids in ODS Ni-20Cr Fabricated with L-PBF.” Oral presentation at Solid Freeform Fabrication Conference, Austin, TX, August 2023.

Optimization of Luminescent Solar Concentrators (LSCs), RPI

Summer 2021

- Deployed LSC Monte Carlo code developed by Dr. D.E. Smith on RPI supercomputer network
- Increased computational speed of the code by a factor of 28, enabling optimization of LSC geometry and financial forecasting
- Developed detailed documentation of supercomputer resources to assist future research efforts
- D.E. Smith, A. Wu, Y. Wang, N.A. Wassermann, M. Hughes, D.A. Borca-Tasciuc. "Multi-Parameter Optimization of Levelized Cost of Electricity of Luminescent Solar Concentrators." ASME Conference on Energy Sustainability, Philadelphia, PA, July 2022.

Awards and Honors

National Defense Science & Engineering Graduate (NDSEG) Fellowship, Army Research Office *Spring 2024*

Granted for outstanding achievements in Science, Technology, Engineering and Math (STEM), selected from a pool of 3,392 applications

National Space Technology Graduate Research Opportunity (NSTGRO) Fellowship, NASA *Spring 2024*

Recognizes graduate student research that has significant potential to contribute to NASA's goal of creating innovative new space technologies for America's science, exploration, and economic future

Graduate Research Fellowship Program (GRFP), National Science Foundation *Spring 2024*

Recognizes and supports outstanding graduate students who have demonstrated the potential to be high achieving scientists and engineers, early in their careers

Ricketts Prize, RPI *Spring 2022*

Awarded at Commencement to a senior in mechanical engineering who has demonstrated outstanding ability in academic work and gives promise of outstanding professional success

Rensselaer Medal Scholarship, RPI *Spring 2018*

\$120,000 award to high school students who have distinguished themselves in mathematics and science

Teaching

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

Develop and present 1-hour lectures for one class section of 10 students on fundamental AI & ML topics, such as decision trees, support vector machines, and neural networks. Hold office hours once per week.

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

Lead 2-hour lab instruction for two class sections of 50 students once per week, teaching CAD, Arduino programming, and finite element analysis. Hold office hours once per week.

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

Assist instructional staff during 2-hour lab periods with 50 students twice per week, teaching electricity and magnetism concepts. Hold office hours once per week.

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

Reviewed probability and statistics concepts with one student twice per week, providing individualized study strategies to increase academic achievement.

Professional Experience

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

- Supported ongoing test and qualification efforts for the S-92 helicopter and related variants
- Reviewed supplier test procedures and data submittals for completion and accuracy
- Provided feedback to suppliers to ensure adherence to internal and government standards