

BRIAN MORTON

CONTACT

Brian Morton

Vanderbilt University
Department of Mathematics
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Nashville, TN 37240, USA

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RESEARCH INTERESTS

- Partial Differential Equations
- Fluid Mechanics
- Mathematical Physics
- Rarefied Gas Dynamics

EDUCATION

Vanderbilt University, Nashville, TN

Doctorate of Philosophy in Mathematics

May 2028

Advisors: Professor Marcelo Disconzi and Professor Jared Speck

Purdue University, West Lafayette, IN

Bachelor of Science in Aeronautical & Astronautical Engineering

May 2023

Bachelor of Science in Honors Mathematics

May 2023

EMPLOYMENT

Vanderbilt University, Nashville, TN

Graduate Research Assistant, Department of Mathematics

August 2024-Present

Graduate Teaching Assistant, Department of Mathematics

August 2023-Present

Johns Hopkins University Applied Physics Laboratory, Laurel, MD

Intern, Air and Missile Defense Sector and Force Projection Sector

May 2022-January 2024

Purdue University, West Lafayette, IN

Researcher, Department of Aeronautical and Astronautical Engineering

May 2021-October 2023

REU, Department of Mathematics

May 2021-August 2021

Grader, Department of Aeronautical and Astronautical Engineering

January 2022-August 2023

Grader, Department of Mathematics

January 2020-May 2023

PREPRINTS

1. Vorozhbit, E., **Morton, B.**, Adhikari, N., Alexeenko, A., & Hu, J. Dgfs-Be Solver: An Open-Source Discontinuous Galerkin Fast Spectral Solver for the Full Boltzmann Equation

PUBLICATIONS

1. Adhikari, N., **Morton, B.**, Alexeenko, A. A., & Hu, J. (2024, February). Verification of a discontinuous Galerkin fast spectral solver for the full Boltzmann equation. In AIP Conference Proceedings (Vol. 2996, No. 1). AIP Publishing.

INVITED TALKS

1. 21st Century Mathematics: What Do Mathematicians Do?, D205 University, July 2025
2. Introductory talk on mathematical fluid mechanics, Graduate Student Seminar, Vanderbilt University, November 2025

TEACHING

- Fall 2023: Calculus Tutor for Vanderbilt Calculus Cafe
- Spring 2024: Calculus Tutor for Vanderbilt Calculus Cafe
- Fall 2024: Not Teaching
- Spring 2025: Not Teaching
- Fall 2025: Math 1301 Accelerated Calculus 2 (Teaching Assistant)

FELLOWSHIPS AND AWARDS

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| • Russell G. Hamilton Scholar Fellowship | <i>August 2023-Present</i> |
| • Warren G Koerner Scholarship Award | <i>June 2022</i> |
| • Thomas Arai Scholarship Award | <i>April 2022</i> |
| • Columbian Club Scholarship Award | <i>August 2021 and August 2022</i> |
| • OUR Scholars Scholarship Award | <i>August 2021 and January 2022</i> |
| • Swaminathan and Garg Scholarship Award | <i>June 2021</i> |
| • Alton and Juanita Andrews Scholarship Award | <i>April 2021, and April 2022</i> |
| • Hugh W and Edna M Donnan Scholarship Award | <i>August 2020, 2021, and 2022</i> |
| • Lorraine K Lawton Scholarship Award | <i>May 2020</i> |
| • Guglielmo Marconi Engineering Scholarship Award | <i>November 2019</i> |
| • Helen Bertucci Pelnarsh Memorial Scholarship Award | <i>November 2019</i> |
| • Dupage Community Foundation Scholarship Award | <i>June 2019</i> |
| • Frank J. Vigiante Scholarship Award | <i>June 2019</i> |
| • Amici Club Scholarship Award | <i>May 2019</i> |
| • HFMA Scholarship Award | <i>April 2019</i> |
| • Dr. Erik K Lossin Memorial Scholarship Award | <i>May 2018</i> |

SERVICE

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| • Vanderbilt Department of Mathematics Directed Reading Program | <i>August 2024-Present</i> |
| • PU Aeronautical and Astronautical Student Advisory Council | <i>January 2021-May 2023</i> |

CONFERENCES ATTENDED

- 3rd Simons Math Summer Workshop: Partial Differential Equations of Classical Physics, July 7-25, 2025,
- Foundations and Applications of Relativistic Hydrodynamics, May 12-16, 2025, The Galileo Galilei Institute For Theoretical Physics, Firenze (IT)
- Particles, Fluids and Patterns: Analytical and Computational Challenges: Intensive Trimester, March 31-July 4, 2025, Gran Sasso Science Institute, L'Aquila (IT)
- Winter School: Boundary and Singularity in Fluid Mechanics, January 6-10, 2025, Simons Center for Geometry and Physics - Stony Brook, Stony Brook, NY
- Boundary Analysis for Dispersive and Viscous Fluid, October 28-31, 2024, Gran Sasso Science Institute, L'Aquila (IT)
- DSMC 2023 Conference, September 24-28, 2023, Santa FE, NM
- Geometry and Analysis of Fluid Flows, January 16-20, 2023, Stony Brook University, Stony Brook, NY
- 32nd International Symposium in Rarefied Gas Dynamics (RDG32), Korea, online, July 2022