Evan Habbershaw

Curriculum Vitae
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EDUCATION

University of Tennessee, Knoxville — Knoxville, TN
PhD, Mathematics — 2018-present
Thesis: Numerical Methods for Multi-Species Kinetic Models

California State University, Northridge — Northridge, CA
MS, Applied Mathematics — 2015-2018
Thesis: Modeling the Impact of Host-Vector Interactions on Pathogen Transmission Between Hosts

California State University, Northridge — Northridge, CA
BS, Mathematics — 2010-2015

RESEARCH EXPERIENCE

University of Washington, Steattle — Seattle, WA
Visiting Scholar — January – March 2024
Project: *Multispecies Fokker-Planck (Lenard-Bernstein) Models*
Advisors: Jingwei Hu and Cory Hauck

Oak Ridge National Laboratory — Oak Ridge, TN
Graduate Research Associate — January 2022 – July 2024
Project: *BGK Kinetic Equations (ORNL-DOE-UT-Battelle CW24420)*
Advisors: Cory Hauck and Steven Wise

Graduate Research Associate — June 2020 – June 2021
Project: *Developing a Better Understanding of Adaptive Velocity Grids for Kinetic Equations (LANL-ORNL-DOE-UT-Battelle RFP584197)*
Advisors: Cory Hauck, Steven Wise, and Jeffrey Haack

California State University, Northridge — Northridge, CA
Master's Thesis Research — August 2016 – July 2018
Project: *Modelling vector-borne plant diseases: Build and analyze a model that incorporates the effects of vector-induced defensive host responses and investigate stability*
Advisor: Jing Li

The Ohio State University, Mathematical Biosciences Institute — Columbus, OH
US-Canadian Epidemiology Summer School: Mathematical Modeling of Infectious Disease Spread — June 2016
Project: *Investigating disease dynamics of Zika and Dengue on a single population; Can Zika virus invade a system where Dengue is endemically present?*
Advisor: Joseph Tien

PUBLICATIONS

6. E. Habbershaw, C.D. Hauck, J. Hu, J.R. Haack, *A Nonlinear, Conservative, Entropic Fokker–Planck Model for Multi-Species Collisions.* (Manuscript submitted to Journal of Statistical Physics.)
   Preprint at `https://arxiv.org/abs/2404.11775`
5. E. Habbershaw, C.D. Hauck, and S.M. Wise, *Implicit Update of the Moment Equations for a Multi-Species, Homogeneous BGK Model.* (Manuscript submitted to SIAM Journal on Numerical Analysis.)
   Preprint at `https://arxiv.org/abs/2404.18039`

4. E. Habbershaw and S.M. Wise, *Year-2 Progress Report on Numerical Methods for BGK-Type Kinetic Equations*. TRACE: Faculty Publications and Other Works – Mathematics, The University of Tennessee (2024). Report number 11.
   `https://trace.tennessee.edu/utk_mathpubs/11`

3. E. Habbershaw, R.S. Glasby, J.R. Haack, C.D. Hauck, and S.M. Wise, *Asymptotic Relaxation of Moment Equations for a Multi-Species, Homogeneous BGK model*. SIAM Journal on Applied Mathematics. (Accepted, with minor revision).
   Preprint at `https://arxiv.org/abs/2310.12885`

2. E. Habbershaw and S.M. Wise, *A Progress Report on Numerical Methods for BGK-Type Kinetic Equations*. TRACE: Faculty Publications and Other Works – Mathematics, The University of Tennessee (2022). Report number 10.
   `https://trace.tennessee.edu/utk_mathpubs/10/`

1. E. Habbershaw, *Modeling the Impact of Host-Vector Interactions on Pathogen Transmission Between Hosts*. CSUN ScholarWorks Open Access Repository (2018).
   `http://hdl.handle.net/10211.3/205734`

TEACHING EXPERIENCE

University of Tennessee, Knoxville — Knoxville, TN
Graduate Teaching Associate, Department of Mathematics — Jan. 2019 – May 2020 & Aug. – Dec. 2021

- Taught several classes in hybrid/flipped format
- Courses Taught:
  - Co-taught large section of MATH 119 (College Algebra, 40+ students, Spring 2019)
  - Instructor of record for MATH 119 (1 section) and MATH 125 (2 sections) (approximately 25 students each)
  - Co-taught extra large online section of MATH 125 (Basic Calculus, 360 students, Fall 2021)
- Main duties:
  - In class: Presented lectures / in-class instruction, facilitated group work, encouraged collaboration.
  - Out of class: Promptly graded and provided useful feedback on all assignments, held office hours to individually assist students, promptly responded to student emails, maintained gradebook, proctored and graded midterm and final exams.

California State University, Northridge — Northridge, CA
Graduate Teaching Associate, Department of Mathematics and Statistics — August 2015 – May 2018

- Courses Taught over the course of the appointment:
  - Instructor of record for 5 sections of *Mathematical Ideas* (MATH 131)
  - Recitation Instructor for the following
    - *College Algebra* (MATH 102L): 5 sections
    - *Business Calculus* (MATH 103L): 9 sections
    - *Precalculus* (MATH 105L): 2 sections
    - *Calculus I* (MATH 150AL): 1 section
    - *Calculus II* (MATH 150BL): 3 sections
    - *Calculus for the Life Sciences I* (MATH 255AL): 1 section
    - *Calculus for the Life Sciences II* (MATH 255BL): 1 section
- Main duties:
  - Helped design MATH 131 course materials; worked with students on projects incorporating mathematics into their major.
  - In class: Presented lectures / in-class instruction, facilitated group work, encouraged collaboration.
  - Out of class: Promptly graded and provided useful feedback on all assignments, held office hours to individually assist students, promptly responded to student emails, maintained gradebook, proctored and graded midterm and final exams.

Mathematics Tutor, Mathematics Department Tutoring Center — August 2013 – May 2015

- Provided tutoring for all 100 and 200 level mathematics courses (including Calculus III and Differential Equations), and various 300 and 400 level courses

SCHOLARSHIPS AND AWARDS

- Mathematics Department Graduate Research Associateship, UTK Mathematics Department (dates above)
- Mathematics Department Graduate Teaching Associateship, UTK Mathematics Department (dates above)
- Edgar and Dorothea Eaves Graduate Teaching Assistant Award Nominee (May 2020)
- Mathematics Department Outstanding Graduate Student Award (May 2018) ($500 Cash Prize)
- Mathematics Department Outstanding Teaching Associate Award (May 2018) ($500 Cash Prize)
- DataJam Data Science Competition (Fall 2017) - Best Use of Reproducible Research ($1,000 Cash Prize)
- Mathematics Department Graduate Teaching Associateship, CSUN Mathematics Department (August 2015 - May 2018)

INVITED RESEARCH PRESENTATIONS

5. *Multi-Species BGK Models with Temperature Dependent Collision Frequencies*
   International Symposium on Rarefied Gas Dynamics, Göttingen, Germany. July 2024.
4. *Multi-Species Kinetic Models for Rarefied Gas Mixtures*
   SIAM Graduate Student Research Showcase, Knoxville, TN. 3 April 2024.
3. *Asymptotic Relaxation and Implicit Euler Methods for a Multi-Species BGK Model*
   Computational and Applied Mathematics Seminar, University of Tennessee, Knoxville, TN. 24 October 2023.
2. *BGK Models: Single Species and Multi-Species*
   Series of 2 talks for Graduate Presentation Seminar, University of Tennessee, Knoxville, TN. 6th and 27th of September 2023
1. *An Analysis of Vector-Borne Plant Disease Models Incorporating Vector-Induced Host Responses*
   Pacific Math Alliance - PUMP Research Symposium, California State University, Northridge, CA, 28 April 2018.

PROFESSIONAL MEMBERSHIPS

SIAM, AMS, MAA

TECHNICAL SKILLS

- MATLAB - Proficient; used in many course projects, Master's Thesis research, and all throughout current research work for PhD Dissertation.
- R - Proficient with several packages utilized for statistical analysis, regression, some Markov Chain Monte Carlo.
- LaTeX- Proficient; used to submit homework for courses since undergraduate studies, as well as assignments for teaching, technical reports, Master's Thesis, published/submitted works, and PhD Dissertation.
- Python - Some experience; mostly used for coursework during MS degree (CSUN).
- Mathematica - Some experience; mostly used for coursework during MS and PhD degree.
- Maple - Some experience; mostly used for Master's Thesis research.
- Microsoft Office - Proficient.

SERVICE

University of Tennessee, Knoxville Knoxville, TN

- Mathematics Department Representative, Graduate Student Senate September 2019 – August 2022
  Committees: Fundraising, Graduate Student Mental Health and Wellbeing, GSS Travel Awards
- Graduate Student Mentor (2 students) August 2020 – May 2021
- Treasurer for UTK Chapter, Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS) August 2020 – May 2021