Bradley Andrew

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ACADEMIC BACKGROUND

University of North Georgia, Dahlonega, GA, Graduation Date: May 2020
Masters of Bachelor of Science & Mathematics, Magna Cum Laude Physics, Magna Cum Laude Mathematics, Japanese Minor
GPA 3.78/4.0

Auburn University, Auburn, AL, Graduation Date: Summer 2023
Master of Science Physics
GPA 3.83/4.0

Nanzan University (Study Abroad), Nagoya, Japan, Summer of 2017

RESEARCH AND INTERNSHIP EXPERIENCE

University of North Georgia, Dahlonega, GA
*CURCA Fuse Summer Research***,** Summer 2019 – Fall 2020

- Researched the idea of creating Thermal 3D Models to better understand building radiated power outputs and heat loss
- Summer research opportunity that emphasized professional development and preparation for graduate research

University of North Georgia, Dahlonega, GA
Research on Binary Star System UV Piscium, Spring 2019 – Summer 2019

- Conducted an independent research project under Dr. Feiden that studied the Binary Star System UV Piscium's stars masses and radii and how it affected stellar evolutionary models

Research on Sound in Electrochemical Systems and Wave Equation, January 2020 – December 2020

Auburn University, Auburn, AL
Anomalous Diffusion and Non-extensive Statistics in Plasmakyrstall-4 (ISS) Dusty Plasma Experiment, Spring 2022 – Current Date

- Data analysis on dust particle locations and tracking with IMAGEJ processed by @msdanalyzer MATLAB code to construct Mean Squared Displacement of particles as well as their velocity distributions.
- Theory crafting and topical reading to understand the nonequilibrium system.
- Connecting theory of Tsallis Statistics and Fractional Laplacian Spectral Code to understand diffusion properties

Runaway Electrons and Magnetic Islands in the DIII-D Tokamak Spring 2023 – Current Date

- Connecting theory of Tsallis Statistics and Fractional Laplacian Spectral Code to try and create reduced model of electron transport in tokamak plasmas.
- Working in General Atomics control room during experiment to observe several diagnostic signals and give back feedback on each shot (test).
- Analyze large amounts of data from 31 shots performed during experiment and assist in academic paper or journal writing
- Analyze two-fluid resistive MHD simulated data of magnetic islands from NSTX-U to understand relations between magnetic island topology, stochastization, electron anomalous diffusion, and plasma disruptions.

TEACHING AND OTHER EXPERIENCE

Auburn University, Auburn, AL
Department of Physics GTA, Fall 2021-Spring 2022
Department of Physics Teaching Fellow for Introduction to Plasma Physics, Fall 2024
Department of Physics Teaching Fellow for Computational Physics, Spring 2025

University of North Georgia, Dahlonega, GA
Department of Physics LA, Spring 2019 to Fall 2020

- Provide Learning Assistance to Introductory and Intermediate Physics students and assisted grading course material
- Identify student areas of weakness and student learning style, then using appropriate teaching methods to convey information
- Use interpersonal skills to relate to people from wide range of backgrounds, abilities, cultures, ethnicities, ages, and levels of income

Tutoring, Independent (In-person and Online)
On and off Tutoring, Spring 2020-Current Date

- Tutored high school math with many different levels of student skill and mathematical topics
- Tutored college calculus 1,2 and 3
- Tutored college physics 1 and 2

PRESENTATIONS:
https://drive.google.com/drive/folders/1D1hz03nlbRiGsU9hhgLVE0Sjh6Oe7r8L?usp=share_link

At Academic Conferences:
Presentation at the Georgia Undergraduates Research Collective 2019. *3D Thermal Models*

American Physics Society Division of Plasma Physics (APS DPP) 2022. *Using Microgravity Dusty Plasma to Study Connections Between Non-Equilibrium Tsallis Statistics, Nonlinear Fokker Planck and Fractional Laplacian.*

Sherwood Fusion Theory Conference and MagnetUS 2023. *Possible Reduced Model for Understanding Non-Equilibrium Systems and Anomalous Diffusion in Plasma.*

APS DPP 2023. *Analysis of Anomalous Diffusion and Velocity Distribution Anisotropy to Understand Structure Formation in Microgravity Dusty Plasma.*

Sherwood Fusion Theory Conference 2024. *Using Nonextensive (Tsallis) Statistics to Characterize Anomalous Diffusion in Fusion Plasmas*

Dusty Plasma Workshop 2024. *Using Tsallis statistics to understand anisotropic anomalous diffusion and equilibrium properties in microgravity dusty plasma*

Mathematical Summer School TXST 2024. *Series Representation and Application of the Fractional Laplacian*

APS DPP and MHD Workshop 2024. *Using Nonextensive Statistics and Spectral Theory to Characterize Anomalous Diffusion in Fusion Plasmas*

Auburn Physics Department Colloquium 2024. *Nonextensive Plasmas*

For Coursework and Program Requirements:
Presentation at the CURCA Fuse Poster Presentation 2019. 3D Thermal Models.

Department of Physics Practicum 2019. *Solar Mass and Stellar Evolution.*

Physics / Astronomy LA Pedagogy Course 2019. *Research on Student's Knowledge of Newton's Third Law.*

Physics Bachelors 2020. *Research on Singing Wine Glasses and it's uses for Undergraduate Advanced Labs.*

Mathematics Bachelors 2020. *Research on a Differential Equation to Model Sound in Electrochemical Systems.*

Space Physics 2023. *A Review on the Interactions between Solar Wind and Lunar Craters.*

Oral Examination for PhD Dissertation Topic 2023. *Using Plasma Physics to Study Connections between Non-Equilibrium Tsallis Statistics, Nonlinear Fokker Planck, and the Fractional Laplacian Operator.*

PUBLISHED PAPERS

Mark Leggiero, Bradley Andrew, Ryan Elliott, John Indergaard, J. B. Sharma, and Thomas Vogel. 2021. "Radiative Heat Loss Estimation of Building Envelopes Based on 3D Thermographic Models Utilizing Small Unmanned Aerial Systems (sUAS)." *Energy and Buildings* 244 (August): 110957. https://doi.org/10.1016/j.enbuild.2021.110957.

PAPERS IN PROGRESS

Bradley Andrew, Evdokiya Kostadinova, Luca Guazzotto, Lorin Matthews, and Truel Hyde. 2024. Anisotropic anomalous diffusion and nonequilibrium in microgravity dusty plasma. Part One: Nonequilibrium Statistical Analysis

https://arxiv.org/pdf/2411.15705

Bradley Andrew, Evdokiya Kostadinova, Luca Guazzotto, Lorin Matthews, and Truel Hyde. 2024. Anisotropic anomalous diffusion and nonequilibrium in microgravity dusty plasma. Part Two: Spectral Analysis

Bradley Andrew, Jessica Eskew, Dmitri Orlov, and Evdokiya Kostadinova. 2025. Analyzing Magnetic Field Topology and it's Relation to Anomalous Diffusion of Electrons

ACADEMIC COURSEWORK

Undergraduate

Principles of Physics I, II (and Labs)
Modern Physics (and Lab)
Principles of Chemistry I, II (and Labs)
Calculus I, II, III

Mechanics
Thermal Physics
Electricity and Magnetism
Research Methods
Junior Seminar
Physics / Astronomy LA Course
Comp for Scientists & Engineers
Intro to Engineering
Advanced Laboratory (I)
Advanced Laboratory (II)
Quantum Mechanics
Stochastic Processes
Abstract Algebra
Differential Equations
Probability and Statistics I
Intro to Linear Algebra
Graph Theory
Intro to Proofs
Computational Physics
Astrophysics
Partial Differential Equations
Electronics (and Lab)
Senior Seminar Physics
Orthogonal Functions
Real Analysis
Fourier Analysis

Graduate

Mechanics
Electricity and Magnetism I
Electricity and Magnetism II
Math Methods
Advanced PDE II
Intro to Plasma Physics
Directed Reading of Plasma Models
Introduction to MHD
Statistical Mechanics I
Quantum Mechanics I
Quantum Mechanics II
Numerical Methods
Statistical Mechanics II
Space Plasma Physics
Plasma Material Interactions

SKILLS (from most fluent on top, to least on bottom)

Laboratory Skills

Statistical Analysis
Spectroscopy
Experimental Design
NAI Detector
HPGe Detector
Oscilloscope

Language Skills

Japanese (4 years)

Computer Skills (from most fluent on top, to least on bottom)

MATLAB
Mathematica
Flir Tools+
Agisoft Metashape
Website Development (HTML & Mobirise)
PSI Plot
Python
Excel
R Studio
Linux Systems (Bash)
JavaScript

Website that I built for my academic research group: https://ipl.auburn.edu

ACADEMIC HONORS AND AWARDS

NASA Scholarship through the University of North Georgia (3 years)
- Awarded to the top two physics students of each academic year

Undergraduate Dean's List (5 semesters)
Accepted to present at National Conference of Undergraduate Research (NCUR)
Completed 2019 JICE Kakehashi Program
Outstanding TA Auburn Physics Department Award 2021-2022