Andrew Igdal

+1 (828)238-6682

andrewigdal@utexas.edu

LinkedIn

Objective

As a dual degree master's student in Public Affairs and Earth and Energy Resources at the University of Texas, my academic focus lies at the intersection of housing and energy policy. However, I hold a personal passion and dedication to the study of the Holocaust and genocides. My Jewish heritage has instilled in me a profound desire to understand some of the complex and devastating facets of such atrocities. The Holocaust, being a well-documented and globally recognized event, offers an unprecedented case study to investigate the conditions, mechanisms, and aftermath of genocide. This understanding can significantly contribute to peace and stability efforts globally, by educating future generations to prevent such atrocities. Armed with a strong skill set and passion for these topics, I am confident in my ability to serve effectively in this role and assist students in comprehending these events and behaviors. Concurrently, this opportunity will help me meet the financial costs of graduate school, enabling my further academic development.

Education

Associates of Science, Catawba Valley Community College, 2019

Bachelor of Science in Economics, North Carolina State University, 2023

Bachelor of Arts in Physics, North Carolina State University, 2023

Master of Public Affairs and Energy and Earth Resources, University of Texas at Austin, expected graduation 2026

Research Experience

Research Analyst, Post Road Foundation, December 2022 – Present

- Specialized in beneficial electrification, analyzing the potential of upgrading HVAC systems and water heaters in rural Alabama.
- Utilized NREL's ResStock software for detailed statistical analyses and modelling of electrification impacts.
- Conducted financial and environmental analyses, developing strategies for cost-effective energy upgrades and carbon emission reduction.

- Collaborated with field professionals for data and insights, enhancing the impact of our work.
- Compiled analysis and results into a readily digestible paper, presenting cost-effective paths for beneficial electrification.

Research Assistant, Post Road Foundation, May 2022 – August 2022

- Conducted comprehensive research on distributed energy resources and grid modernization.
- Created a detailed database of significant players in the grind modernization market.
- Presented findings and recommendations on competitive strategies in the grid modernization sector.

Undergraduate Physics Researcher, Dr. Daniel Dougherty, NCSU, Feb 2022 – May 2023

- Investigated the potential applications of transition metal trihalides (TMHs) in memristance.
- Studied the Mott insulator RuCl3, uncovering valuable insights into its complex behavior.
- Discovered a high ideality factor in relation to the Schottky barrier at the RuCl3 interface, aiding our understanding of voltage thresholds in memristors.
- Utilized advanced tools such as Atomic Force Microscopy (AFM) and Diffuse Reflectance Spectroscopy (DRS) in the analysis and optimization of TMH thin films.

Undergraduate Astrophysics Researcher, Dr. John Blondin, NCSU, Spring 2020 – Spring 2022

- Conducted research into high mass X-Ray Binaries and their characteristics, with a focus on the wind dynamics of Vela X-1
- Investigated the impact of wind characterization and Roche lobe levels on these dynamics through computational models.
- Collaborated on paper detailing the results and insights from this research. =
- Presented findings at the 2020 McCormick Symposium

Teaching Experience

Physics Tutor 2020 – 2023

- Provided tutoring assistance in the areas of mechanics and electrodynamics.
- Employed techniques tailored to individuals to ensure comprehensive understanding of principles.
- Fostered an inclusive and engaging learning environment that aided in the improvement of students' problem-solving skills, comprehension, and academic performance in physics courses.

Economics Tutor 2021 – 2023

- Provided tutoring assistance in the areas of micro and macro-economics as well as econometrics and game theory.
- Employed techniques tailored to individuals to ensure comprehensive understanding of principles.

- Fostered an inclusive and engaging learning environment that aided in the improvement of students' problem-solving skills, comprehension, and academic performance in economics courses.

Math Tutor 2021 – 2023

- Provided tutoring assistance in the areas of calculus I through calculus III including differential and partial differential equations.
- Employed techniques tailored to individuals to ensure comprehensive understanding of principles.
- Fostered an inclusive and engaging learning environment that aided in the improvement of students' problem-solving skills, comprehension, and academic performance in economics courses.

Projects

Balancing Equality of Opportunity and Outcome: Economic Analysis through Settlers of Catan and Real-World Policies, NC State University, Spring 2023

- Economic analysis using Settlers of Catan, a strategic board game, to investigate the implications of balancing equality of opportunity and equality of outcome as my economics capstone project. Applied a blend of game theory and policy analysis to generate insights into effective societal resource distribution and strategic investment.
- Utilizing a modified rule set of Catan emphasizing equality of outcome I analyzed gameplay outcomes, observing that equality of outcome-based rules resulted in less productive strategies and slowed development.
- Drew parallels with real-world policies focused on wealth redistribution and affirmative action, demonstrating how well-intended policies can sometimes produce unintended negative effects. Argued for the importance of ensuring equality of opportunity, citing real-world examples like Free and Reduced Lunch Programs, Child Health and Tax Credits, and Early College High Schools (ECHS). These initiatives promote equal access to opportunities, irrespective of individual starting points.
- Constructively addressed criticisms arguing that focusing on equality of opportunity may overlook systemic biases and structural disadvantages. Made a case for the balance of rectifying systemic inequities while providing everyone with equal access to opportunities.
- The project provided a comprehensive, critical, and creative exploration of complex economic and social concepts, ultimately underscoring the importance of balancing opportunity and outcome for a prosperous society. This exercise honed critical thinking, economic modeling, and policy analysis skills.

Due Diligence Fees Impact on Housing Market: A Game-Theoretical Analysis and Real-World Policy Implications, NC State University, Spring 2023

- Game-theoretical research project investigating the influence of due diligence fees on buyer and seller decisions in the housing market as part of my economics capstone project. Applied complex models and policy analysis to generate insights into buyer-seller behaviors and due diligence fee impacts.
- Constructed and analyzed multiple game-theoretical models based on different levels of desperation and home values (Low Desperation Low Value - LDLV, Low Desperation High Value - LDHV, High Desperation Low Value - HDLV, and High Desperation High Value - HDHV). Identified Subgame Perfect Nash Equilibria (SPNE) using backward induction - logic, elucidating various interaction outcomes influenced by due diligence fees.
- Highlighted the real-world applicability of these models through comparison with the competitive housing market in the Raleigh-Durham-Chapel Hill area, demonstrating how high due diligence fees often don't deter potential buyers. This correlation lent practical validation to the theoretical models.
- Proposed policy recommendations based on model outcomes to protect home buyers and limit high due diligence fees. These included establishing a cap on due diligence fees, offering financial literacy programs, and creating more accessible mortgages.
- Addressed the inherent limitations of applying game-theoretical models to complex real-world phenomena, emphasizing the need for nuanced, context-specific models for different communities. This project honed critical thinking, economic modeling, and policy analysis skills while offering significant insight into the impact of due diligence fees on the housing market. Future work aims to construct a detailed model to represent socio-economic complexities of specific communities accurately.

Talk on Modern Jewish Identity & Responsibilities: A Perspective from the American South, Sisterhood Grant, Temple Beth Shalom, Fall 2022

- Delivered an insightful and thought-provoking talk on the experiences and challenges faced by Jews, particularly in the American South, following my enriching Birthright trip to Israel. The discussion addressed issues of anti-Semitism from both left and right political ideologies, the uniqueness of southern Jewish identity, and the ongoing commitment to contribute to the betterment of mankind.
- Presented an analysis of anti-Semitism in the modern era, focusing on its diverse manifestations from both political spectrums. Discussed how these forms of discrimination differ, yet equally impact Jewish communities, and how they shape the collective Jewish experience and individual identities.
- Explored the unique position of American Jews, particularly those from the South, in the face of these challenges. Discussed the influences of southern culture on Jewish practices and perceptions, along with the complexities of integrating Jewish and American identities.
- Promoted proactive dialogue on strategies to counteract anti-Semitism and encouraged community members to foster a culture of tolerance, understanding, and respect within their respective spheres of influence.

- Emphasized the Jewish principle of 'Tikkun Olam' (repairing the world) as a guiding philosophy in these challenging times, advocating for collective efforts to work towards social justice and the betterment of mankind.
- The talk spurred meaningful conversations, increased awareness about anti-Semitism, and inspired community members to reaffirm their commitment to societal betterment.

Senior Design Project - Linear Collider Physics Demonstration, Fall 2022

- Designed and constructed an interactive physics demonstration model illustrating the principles of elastic collisions. The core component of the project is a linear collider that precisely drops an object of known mass, allowing it to strike a target material. The key objective was to minimize energy loss during the drop, resulting in a demonstrative effect of the object rebounding if sufficient energy remained post-collision.
- The project was designed to explore and exhibit the principles of conservation of energy and momentum, focusing particularly on understanding the elasticity of collisions.
- Conducted comprehensive planning and design phases, including calculating optimal object mass and drop height to balance energy loss and visual impact.
- Employed engineering and construction techniques to build the collider, involving skills in blueprinting, woodworking, and metalworking.
- Prototyping and refining the design, focusing on reducing friction and energy losses.
- Developing explanatory materials to accompany the demonstration, explaining the physics principles at work in an accessible and engaging way.
- Provided a tangible illustration of complex physics principles and made these principles accessible and engaging to a non-specialist audience.

Discrete Variable Representation for Solving the Few-Body Quantum Bound State Problem, NC State University, Fall 2022

- A final project using Discrete Variable Representation (DVR) method to solve the Few-Body Quantum Bound State Problem, which presents challenges in many-body quantum systems. By leveraging understanding of quantum mechanics, numerical methods, and computational resources, my group developed a solution that provided insights into the behavior of these quantum systems. This project not only expanded my knowledge in computational physics and quantum mechanics but also improved my problem-solving skills, particularly in complex, non-linear systems. This project was by far the most challenging one I have been a part of and required extensive teamwork and communication.

Electron Storage Rings Research Paper EM, NC State University, Spring 2022

- Conducted research and wrote an academic paper on electron storage rings, investigating their theoretical underpinnings and practical applications as my final project. The paper highlighted the physics involved in the storage and control of high-energy electrons and provided an understanding of the technical complexities involved.

Volunteer Experience

Member, Physics Diversity, Equity, and Inclusion (DEI) Committee, Fall 2022 – Spring 2023

- Actively contributed to the Physics Department's mission to promote lasting change by creating an equitable and inclusive environment for all staff, students, postdocs, and visitors.
- As part of the Membership and Recommendation Subcommittees, I assisted with the nomination and membership change processes, ensuring representation and diversity in our committee.
- Prioritized and recommended DEI-focused initiatives, contributing to a more diverse and inclusive learning and working environment.

Volunteer, Habitat for Humanity International, Spring 2016 – November 2019

- Contributed over 500 hours of service to housing projects in Hickory, North Carolina.
- Coordinated volunteer teams of high school students with Catawba Valley Habitat for Humanity.
- Participated in the construction of North Carolina's first DOE Certified Net-Zero homes, gaining hands-on experience in sustainable housing initiatives.

Skills

Technical Skills:

- **Software & Programming:** LabVIEW, Zemax, MEEP, Python, FORTRAN, C++, SAS, GRETL
- **Design & Construction:** SOLIDWORKS, 3D Printing, Blueprinting, Woodworking, Metalworking, Soldering, Wiring
- **Analytical Techniques:** Diffuse Reflection Spectroscopy, X-Ray Spectroscopy, Atomic Force Microscopy, Electrical Characterization

Project Management Skills:

- Leadership
- Time Management
- Risk Management

Interpersonal Skills:

- Emotional Intelligence
- Public Speaking
- Negotiation
- Group Organization

Problem Solving Skills:

- Critical thinking

- Creative problem solving
- Adaptability
- Forecasting

Research Skills:

- Qualitative and Quantitative Research
- Data analysis
- Hypothesis Testing
- Experimental Design

Communication Skills:

- Technical Writing
- Report Writing
- Active listening
- Presentation skills

Awards and Achievements

- **Dean's list 4x:** Recognized for outstanding academic achievement at NC State University.
- **Nominated for Outstanding Undergraduate Physics Student, 2022**
- **NCSU OUR Grant Recipient, Fall 2022:** Awarded funding for a research proposal focused on the search for memristance in doped $RuCl_3$.
- **FREEDM Systems Center Energy Pitch Finalist, Fall 2021:** Developed and pitched a business plan for an energy-saving smart switch, reaching the final round of the competition.
- **Fall 2021 Envision Research Competition Winner:** Secured first place in the Video & Interactive category with the project "Wind Driven Accretion onto a Black Hole".
- **Sisterhood Grant, Temple Beth Shalom, Fall 2022**

Professional Associations

Society of Physics Students (SPS): member of a community dedicated to fostering interest in physics among students from various academic backgrounds. Participate in networking events, professional development workshops, and peer-led seminars.

Omicron Delta Epsilon (ODE): Member of an international honor society in the field of economics. Recognized for academic excellence and contribution to the discipline of economics.

References

Dr. Albert Young, Former Professor, Physics, North Carolina State University, aryoung@ncsu.edu

Dr. Carla Frohlich, Former Professor, Physics, North Carolina State University, cfrohli@ncsu.edu

Dr. Daniel Dougherty, Former Professor and Advisor, Physics, North Carolina State University, dbdoughe@ncsu.edu

Dr. William Phan, Former Professor, Economics, North Carolina State University, wphan@ncsu.edu

Dr. Seth Hoedl, Advisor, CSO and CEO of Post Road Foundation, sethhoedl@gmail.com