Student Research and Internship Symposium

Summer Faculty-Student Collaborative Research (SCoRe) and Internship Presentations

FRIDAY, FEB. 21 2025
3 - 5 p.m.

SCHEDULE

Student Research & Internship Symposium

Friday, February 21, 2025
Edith Kinney Gaylord Cornerstone Arts Center

3-3:50 P.M. RICHARD F. CELESTE THEATRE

Opening Remarks

Manya Whitaker, Interim President of the College

Student Presentations

Luke Stanley ’25
Sexual Crosses with the Mucoromycete Phycomyces blakesleeanus

Xinran Wang ’25
I Know What This Is: Disembodied Deductive Aesthetic Attention Flattens Aesthetic Experience

Emily Lowe ’27
The Nature Conservancy, Steamboat Springs, CO

Michael Flynn ’25
Sunday Morning Music LLC, Fort Meyers, FL

Julia Watson '25
Colorado Immigrant Rights Coalition, Denver, CO

3:50–5 P.M. CORNERSTONE MAIN SPACE

Poster Presentations

3:50-4:25 P.M.	Session 1	Research Abstracts P1-27/ Internship Reflections IR1-IR27
4:25-5 P.M.	Session 2	Research Abstracts P28-P56/ Internship Reflections IR28-IR54

DEAR CC COMMUNITY,

Welcome to the annual Student-Faculty Collaborative Research (SCoRe) & Internship Symposium! Today, we celebrate the incredible work of Colorado College students who have spent their summer engaged in hands-on research and immersive internships, supported by faculty, staff, alumni, and mentors on and off campus.

These high-impact practices reflect the active, collaborative learning at the heart of CC's Block Plan. They challenge students to engage meaningfully — and on a deeper level than can be done in the classroom alone. Whether in a lab, nonprofit, or corporate setting, students learn to analyze new information, adapt their thinking, and form original insights to contribute to their fields. As a former SCoRe mentor, I've seen how these experiences inspire students to take ownership of their learning — actively seeking insight and guidance from faculty mentors within a culture of shared responsibility.

As you explore today's projects, I encourage you to ask questions and appreciate not just the final results, but the process behind them. The critical inquiry, synthesis, and presentation skills these students have gained will serve them long after they leave CC, shaping the way they approach new challenges and opportunities.

I am proud of the students whose work is on display today and grateful to the faculty, staff, alumni, and internship mentors who make such opportunities possible. Thank you for being part of this celebration of discovery and learning in action.

Warmly,

MANYA WHITAKER
INTERIM PRESIDENT

Sexual Crosses with the Mucoromycete Phycomyces blakesleeanus

Student Researcher: Luke Stanley ’25
Major: Organismal Biology and Ecology
Faculty Collaborator: Jesús Peña, Organismal Biology and Ecology

Phycomyces blakesleeanus, a filamentous fungus within the Mucoromycota phylum, is distinguished by its remarkable capacity for environmental perception and adaptive responses. While past work has shown that environmental stimuli, including gravity, light, moisture, and nutrient availability, influence its growth dynamics and reproductive strategies, the underlying mechanisms remain a focal area of research. Environmental cues trigger sexual or asexual reproduction. Sexual reproduction begins with pheromone signaling which triggers hyphal chemoattraction, eventually leading to serial morphological transitions culminating in the formation of a zygospore. In a laboratory setting, crosses of *P. blakesleeanus* result in complementary mycelia undergoing the sexual cycle at different stages. Our work aims to test if environmental cues can trigger the mating across the mycelia of *P. blakesleeanus*. Crosses of *P. blakesleeanu*s grown on nutrient-limited media will be subjected to nutrient limited agar to trigger a sexual response in accordance to nutrient depravation. Successful triggering of mating in *P. blakesleeanus* will facilitate future studies that require a large amount of sexually reproducing mycelia in specific stages. The outcome of this research will further enhance our understanding of how *P. blakesleeanus* reproductive mechanisms are influenced by environmental factors, contributing to the broader knowledge base on the sexual reproduction of filamentous fungi.

I Know What This Is: Disembodied Deductive Aesthetic Attention Flattens Aesthetic Experience

Student Researcher: Xinran Wang ’25
Majors: Psychology, Philosophy
Faculty Collaborator: Tomi-Ann Roberts, Psychology

In this study, we developed and tested the Aesthetic Attention Scale (AAS), a self-report state scale assessing how individuals engaged their attention in an aesthetic experience. Sample items include: “While looking at the artwork, I felt myself becoming deeply absorbed in it.” and “I relied on my prior knowledge to make sense of this artwork.” We tested the scale in an online study in which participants were shown two art photography images and responded to questions to ensure engagement. The AAS is reliable and is positively correlated with Openness to Experience and negatively correlated with Need for Closure. We found that those who attended to two works of visual art in a more disembodied, deductive way, as assessed by the AAS, spent less time looking at the art, rated the experience as less enjoyable, found the works less interesting, had poorer memory for the details of the works, scored lower on aesthetic emotions like fascination and higher in negative emotions such as boredom, and lower in non-relational self-expansion after the task.

The Nature Conservancy, Hayden, CO

Charlie Blumenstein Stewardship Internship

Student Intern: Emily Lowe ‘27
Major: Physics

For the summer of 2024, I had the privilege of being last year’s Charlie Blumenstein Intern which allowed me to work for The Nature Conservancy as a Stewardship Assistant. For this position, I was working and living at Carpenter Ranch, a Nature Preserve in Steamboat, Colorado, owned by The Nature Conservancy. My responsibilities ranged widely on the ranch, including monitoring easement points, giving tours of the property to visitors, operating equipment for general maintenance, and collecting water level data. With this opportunity, I also had the privilege of designing and conducting my own field research project. For this, I used water temperature sensors to analyze temperature within a 1-mile stretch of the property’s irrigation ditch. I then used this data to theorize the effects that climate change may have on irrigation ditch water quality. Through all of this, I gained valuable experience in GIS, experimental design, mathematical modeling, communication, and general maintenance that I will continue to carry with me into everyday life and future careers. I also gained a better understanding of what a career in conservation would entail and networked with many people at and associated with The Nature Conservancy which holds many opportunities for my future career. Carpenter Ranch will always hold a special place in my heart that has shaped my opinion on conservation work in the West.

Sunday Morning Music LLC, Fort Meyers, FL

Student Intern: Michael Flynn ‘25
Major: Film & Media Studies

I had the opportunity to work as a video production/digital marketing intern, in a hybrid position, for this small independent record label/management company. I was mostly working for their main artist Nate Traveller. Despite his streaming success, his online media presence is relatively small and is a place of potential. As the label is quite small (5 people), my responsibility was to lead the production of visual media to help develop the artists’ online visual presence and identity, consisting of music videos, and general social media content. Through this opportunity, I was able to conceptualize, pitch, direct, and produce two music video projects for Nate, in collaboration with Nate and his team, as well as produce additional promotional material for him for his recent album release, and promotional material for 2 other artists. I gained valuable experience and knowledge about what it means to work closely in this role with an artist; the work is intimate, his music is vulnerable, and the process of creating these music video projects was challenging but rewarding. In my shadowing of both Nate and his manager, I also gained valuable knowledge of what it takes to manage artists, protect them, and make a profitable business. This experience has already provided possibilities for future work and will remain a valuable experience as I move beyond college into my career.

Colorado Immigrant Rights Coalition, Denver, CO

Colorado College's Public Interest Fellowship Program

Summer Intern: Julia Watson '25
Major: International Political Economy and Romance Languages

Colorado College's Public Interest Fellowship Program is a pre-professional opportunity for CC students to engage with nonprofit work in Colorado. In pairing one to two students with one of the program's nonprofit partners for 3-12 months, the program helps students to develop tangible skills to better serve their community. I was paired with Colorado Immigrant Rights Coalition (CIRC), a state-wide coalition organized around serving and improving the lives of the immigrant community in Colorado. CIRC provides political advocacy, legal services, resource navigation and public education to achieve their mission of making Colorado a more welcoming, immigrant-friendly state. I worked with CIRC during the summer of 2024 as the legal services and resource navigation fellow. During my time at CIRC, I contributed to campaigning for CIRC endorsed candidates during the Colorado primaries, engaged in bilingual resource navigation which directed community members to accessible healthcare, legal, housing and food bank services, and helped facilitate Know Your Rights trainings and naturalization workshops. CIRC serves as a fierce advocate for immigrants and their community. Their work is invaluable in creating a state where everyone is included and cared for.

What is SCoRe?

During the summer of 2025, over 120 students participated in research under the mentorship and support of Colorado College's dedicated faculty both on and off campus. While the Block Plan structures academics around a condensed timeline, summer research allows students and faculty collaboratively to explore deeper into topics, by spending extended time researching in the classroom, the library, the lab, and the field.

The Student Collaborative Research (SCoRe) Program supports both students and faculty through academic and community field trips and gatherings, peer-to-peer presentations and discussions, and professional development workshops. We are excited to showcase the work CC faculty and students have done this summer.

Visit:
http://www.coloradocollege.edu/offices/careercenter/research-opportunities/index.html

P1 Augmenting GINR Neural Networks for Unknown Data

Student Researcher: Mira Giles-Pufahl ’25
Major: Computer Science
Faculty Collaborator: Cory B Scott, Mathematics and Computer Science

We provide a proof of concept that a neural network can be modified to more accurately predict outcomes of data that it has not been trained on. Generalized implicit neural representations (GINRs) are neural networks that are extremely good at predicting outcomes based on data that they are trained on. They become less accurate when attempting to predict from new data and repeatedly training new models is costly and inefficient. As a base experiment, we ran trained neural networks on randomized graphs. The difference in the graphs as vector length was plotted against the combined error to determine the successfulness of the experiment and subsequent modifications. We implemented four different methods of modification: [1] retraining the neural networks before calculating error, [2] using only slightly modified graphs, [3] rotating the eigenvalues, [4] applying graph diffusion distance and Umeyama rotation. To further improve this, we altered graph generation and applied a permutation matrix to shift the matrices for improved alignment before rotation. We observed a slight linear trend that could be improved with more testing on variables, especially increasing the size of the graphs. For future work, we would like to apply this algorithm on real-world datasets similar to the mapping of protein charges to further test this.

P2 Atmospheric Influences on the Juneau Icefield Snowpack

Student Researcher: Claire Thompson`25
Major: Environmental Science
Faculty Collaborator: Aaron Chesler, Environmental Studies Program

Globally, Alaskan glaciers are the largest single contributor to sea level rise from glacier melt. The Aleutian Low, the dominant synoptic climate feature, controls winter precipitation for Alaskan glaciers via the advection of air masses from the Gulf of Alaska into the terrestrial environment. The Juneau Icefield, located at 58°-59°N in southeast Alaska, is particularly sensitive to the Aleutian Low. Given the icefield’s hypsometry, minor increases in temperature or changes in precipitation can accelerate mass loss. Ions preserved in the snow can be used to explore changes in sources of air mass. Previous ion analyses by Kehrwald et al (2019) indicate a 53.4% and 113% difference in Ca^{2+} (continental influence) and Na^{+} (maritime influence) concentrations, respectively, between the Matthes and Llewellyn glaciers, located on the icefield’s continental side. However, no data exists for the maritime-influenced Lemon Creek Glacier and tidewater Taku Glacier, the largest glacier on the Juneau Icefield, leaving a significant knowledge gap. We hypothesize that Lemon Creek and Taku will exhibit higher Na^{+} concentrations due to their proximity to the Gulf of Alaska, while Llewellyn will show higher Ca^{2+} concentrations from continental air mass influences. This study will provide critical insights into the Juneau Icefield’s susceptibility to rising temperatures and a shifting Aleutian Low.

P3 Uncovering Mechanisms of rDNA Translocation: manipulation of small RNAs at subtelomeres in *Schizosaccharomyces pombe*

Student Researcher: Torah Delaney ’26
Major: Biochemistry
Faculty Collaborator: Julia Promisel Cooper, PhD, Lakshmi Sreekumar, PhD; Affiliation: Faculty Department: Department of Biochemistry & Molecular Genetics, University of Colorado Anschutz Medical Campus, Denver, Colorado Internship Program: Graduate Experiences for Multicultural Students 2024 Internship Program Research Funding Source: National Institute of Health Grant (NHLBI- 5R25HL103286) through the Graduate Experiences for Multicultural Students 2024 Internship Program

Telomeres are specialized structures at the ends of linear chromosomes. They guard the genetic material of chromosomes, managing checkpoints and regulatory pathways during cell division. Telomeres decline in length as cells undergo replicative aging. Cancer cells have evolved mechanisms to circumvent the terminal shortening of telomeres. This project aims to investigate the possible mechanism of nonhomologous translocation of rDNA to all chromosome ends in telomere minus cells on the *S. pombe* genome. The nonhomologous translocation of rDNA to all telomeres’ chromosome ends in telomerase minus cells requires the nuclear RNAi pathway. We hypothesize that rDNA-DNA hybrids promote translocation. Small RNAs targeted subtelomeres in *S. pombe* cells using RNA guide sequences and dcas9-CRISPR technology. Fluorescence microscopy was implemented to visualize and assess the efficiency of guide constructs targeting subtelomeric regions of rDNA translocation. A primary vector and five DNA constructs were created to target RNA guide sequences in the *S. pombe* genome. All constructs showed fluorescent signal in the nucleolus of the cell, where the rDNA resides. However, the negative control sequence showed a similar fluorescent signal.The dCas9-CRISPR expression system efficiently targeted small RNAs. Future experiments will establish a negative control and optimize the dCas9 localization system on the *S. pombe* genome.

P4 *Tamarix ramosissima* Sensitivity to ABA in Fountain Creek, CO

Student Researcher: Jill Coleman ’26
Major: Organismal Biology and Ecology
Faculty Collaborator: Shane Heschel, Organismal Biology and Ecology

The invasive shrub *Tamarix ramosissima* poses a threat to riparian ecosystems throughout the southwestern United States. Due to its ability to establish and persist in stressful conditions, in part ascribed to its extensive and plastic root biomass allocation, *Tamarix* is able to outcompete native species and alter water table depths (Lovell et al. 2009; Robinson 1965; Cleverly et al. 1997). Furthermore, an understanding of water-use traits, especially in drought prone environments, is essential in interpreting this plant's competitive relationships and water system impacts. Stomatal conductance, an index of water vapor loss, is a trait regulated by the plant hormone abscisic acid (ABA) (Glenn et al. 2013). Although ABA concentration has been found to increase in *Tamarix* as a response to water and foliar stress from a biocontrol agent (Craine et al. 2016), ABA sensitivity has not been studied in this system. To understand differentiation in *Tamarix* populations’ water use traits based on varying growing conditions, we asked the following questions: 1) How does *Tamarix* population site morphology impact stomatal conductance? 2) How does ABA application impact stomatal conductance and water use efficiency (WUE)? 3) Does population growing condition impact sensitivity to ABA?

P5 The Turn to Autotheory: Why the Personal is Political

Student Researcher: Anabel Shenk`25
Major: English (Literature)
Faculty Collaborator: Aline Lo, English

This past summer, I assisted Professor Aline Lo on research for the book she is working on about Hmong American refugee narratives that is to be a hybrid, weaving together scholarly literary criticism with personal insights on her own family's experience. Our research began by investigating "Autotheory" as a genre of literary writing. I began by reading Y-Dang Troeung's "The Afterlife of the Cold War in Cambodia" to acquaint myself with the type of texts Lo is working alongside, pulling parts of it that would be helpful for our research. It served as an example of an autotheoretical text on the topic of refugee narratives. I also read Lauren Fournier's "Autotheory as Feminist Practice in Art, Writing and Criticism" in order to gather helpful definitions of the genre that may be helpful for Lo as she continues work on her own project. Our research then narrowed in on Lo's first chapter which is about photographs and the role they play in telling stories and recounting history. We were thinking about photos found in family albums, photos found in the archive, official or document photos, etc. I did specific research on Thi Bui's *The Best We Could Do* and Maxine Hong Kingston's *The Woman Warrior,* two central texts to Lo's first chapter. We also discussed the ways others have theorized about the role of photographs, like in Tina Campt's *Listening to Images* and in Marianne Hirsch's *Family Frames: Photography, Narrative, and Postmemory*.
Fountain Valley Water Project

P6 Examining North American ENSO Teleconnections in Response to an AMOC Slowdown

Student Researcher: Anneka Rust '25
Major: Environmental Science
Research Collaborator: Chijun Sun, Earth and Planetary Sciences Department, University of California Davis
Faculty Collaborator: Allison Lawman, Environmental Studies Program

Abrupt shutdowns of the Atlantic Meridional Overturning Circulation (AMOC) result in significant shifts in global climate patterns worldwide. Climate models suggest that the AMOC may weaken with global warming; however, the temperature and hydroclimate responses in the tropical Pacific and its associated teleconnected regions remain uncertain. Here we examine the effects of an AMOC shutdown on El Niño-Southern Oscillation (ENSO)-related teleconnections using 3 freshwater hosing simulations from the Community Earth System Model version 1. The simulations were performed under 12, 15, and 21 ka boundary conditions with 0.1 and 0.2 Sv of freshwater forcing applied in the North Atlantic to weaken the AMOC. We focus on the simulated changes in boreal winter (DJF) temperature, precipitation, and sea level pressure patterns in response to ENSO and its implications for North American hydroclimate. Our preliminary results suggest that a weakening of the AMOC enhances ENSO-related teleconnections in North America, yielding wetter conditions in the western U.S. during boreal winter. We also find that the El Niño-related North American rainfall teleconnections are sensitive to the spatial pattern of tropical Pacific Sea surface temperature anomalies. Ongoing work will further investigate the simulated response of ENSO flavors to reduced AMOC.

P7 Exploring an Optimal Control Approach to Renewable Resource Management

Student Researcher: Isaac Fayram ’25
Major: Mathematical Economics
Faculty Collaborator: Ike Agbanusi, Mathematics and Computer Science

Management of renewable resources can be polarizing. Often there are multiple goals, which may include meeting current demand, maximizing income, and long-term sustainability. We sought to use techniques from optimal control theory and game theory to find a solution for optimal management of a generic renewable resource. Optimal control theory seeks to find a control (e.g., harvest) over a state (e.g., fish population) such that a function is optimized. Game theory is an approach to solving games in which the outcome of one person’s choice depends on the choice of others. In our game, we considered fixed versus variable pricing and one versus many players. We solved the game by constructing a Hamiltonian, applying the Pontryagin Maximum Principle, and then solving for each player’s strategy. The ‘benevolent dictator’ solution (single player control of the resource) achieves the highest extraction amount under dynamic pricing and always outperforms the competitive Nash equilibrium (perfect competition). Our major contribution was expanding work under fixed pricing to identify the optimal solution under the more complex scenario of dynamic pricing. Further work could include exploring the effects of specific pricing structures or the exploration of different solution concepts (e.g., Stackelberg, Shapley Values).

P8 Lock-in Interferometry for Time-resolved Electron Density Measurements at Atmospheric Pressure

Student Researcher: Marrina Jacka`26
Major: Physics
Faculty Collaborator: Adam Light, Physics

As part of our work on understanding plasma-based remediation of contaminated water, we are developing an interferometer to measure the electron density in atmospheric pressure plasmas driven by nanosecond pulses (NSP). Interferometry is widely used in low-pressure plasmas but is less common for atmospheric pressure plasma (APP). The index of refraction of APPs is not entirely dominated by the electron density and interpretation is often complicated by neutral gas heating. We use a pulsed light source and low-jitter timing electronics to simplify interpretation and recover stroboscopic time-dependence in the plasma discharge. Because the ionization fraction is low (10^-4) and the physical size of the plasmas is small (mm), the interferometric phase shift is also small (microradians). We use lock-in detection and an integer-ratio combination of pulse rates to recover the small signal in spite of significant EMI from the plasma. We will describe the current status of our diagnostic and present preliminary time-resolved electron density measurements.

P9 Pass the Gas: Mapping Galactic Winds from the LMC

Student Researchers: Sabra Catalano`26; Anders Ripley`25
Majors: Physics; Physics
Faculty Collaborator: Dhanesh Krishnarao, Physics

Galactic winds are crucial to understanding their host galaxies in terms of star formation rates, stellar masses, metal content, spatial distribution, and other observable properties. However, due to a multitude of potential driving sources, it is hard to resolve these winds and observationally identify their components and sources. The LMC, a satellite galaxy of the Milky Way, serves as an ideal target to analyze different properties of galactic winds due to its proximity, face-on geometry, and abundance of multi-wavelength data. We used archival data from the ULYSSES survey, focusing on data from STIS (Space Telescope Imaging Spectrograph) onboard the Hubble Space Telescope to measure absorption features of OI (neutral oxygen) and Si Il (singly ionized silicone) to trace the cool gas in winds emerging from the LMC. We normalized the absorption continuum and used VoigtFit to determine the velocities, column densities, and widths of absorption lines for both the OI and SilI ions. From our fit results, we present preliminary maps that display the column density of outflowing gas compared to the LMC disk, looking for a correlation between outflowing OI and active star formation. This research is part of a larger HST Legacy Archival program (HST-AR 16602; PI Barger) aimed at mapping the LMC wind in fine detail across various types of ions and gas phases.

P10 Optimization of Benzyne insertion reactions via AMTBA precursor

Student Researchers: Ethan Bost ‘26
Major: Chemistry
Faculty Collaborator: Jessica Kisunzu, Chemistry and Biochemistry

Benzyne formation from the precursor AMTBA has proven to be a potentially greener, faster, and more convenient alternative to other benzyne generation methods. This method has been utilized primarily with concerted reactions, however our lab has expanded the scope to multi step insertions. Problems have been encountered with yield limiting side products, however, namely in the form of benzoic acid. We have further optimized this insertion reaction utilizing an alternative wavelength and photoreactor which generates the insertion product at a 28% yield while keeping the yield-limiting side product to 12% yield at the cost of a longer reaction time. This alternative wavelength provides a pathway towards increasing yields by keeping alternative reaction pathways to a minimum. Further optimizations made by testing reaction temperature, pH, time, wavelength, stoichiometry, and expansion of substrate scope are outlined in this paper.

P11 Beyond the 950 ppm Threshold: Evaluating CO_2 Concentrations in Campus Spaces

Student Researcher: Maggie Nguyen`26
Major: Chemistry
Faculty Collaborator: Sally Meyer, Chemistry and Biochemistry

Carbon dioxide (CO_2) levels in well-ventilated spaces typically range from 400-1000 ppm, but concentrations above 1000 ppm can adversely affect human health. College students, who spend significant time indoors studying, socializing, and sleeping, may be exposed to unsafe CO_2 levels. Prolonged exposure to high CO_2 concentrations has been linked to fatigue, cognitive impairment, and headaches. This study evaluates CO_2 levels in various spaces on Colorado College's campus, comparing them with safe thresholds and recommended occupancy. Student volunteers recorded CO_2 concentrations using a TemTop monitor while engaging in typical indoor activities. CO_2 decay was measured after leaving rooms with closed windows and doors, simulating winter conditions. The data were used to calculate room infiltration rates (Q) and respiration values (S), which were then modeled under different scenarios. However, the data collected were insufficient to draw definitive conclusions regarding the safety of the spaces.

P12 Improving CD70 CAR T cells with B7H3 antigen specific co-stimulation for pediatric Acute Myeloid Leukemia

Student Researcher: Naomi Leadbeater ‘25
Major: Biochemistry
Research Collaborator: St. Jude Children’s Research Hospital
Faculty Collaborator: Paulina Velasquez, Department of Bone Marrow Transplantation and Cellular Therapies

While health outcomes for patients with Acute Myeloid Leukemia (AML) have improved in recent years, the overall pediatric survival rate is still relatively low compared to other childhood cancers. Additionally, AML has a high treatment-associated morbidity and mortality rate. The creation and characterization of more effective and less toxic treatments for pediatric AML are paramount to combating this devastating disease. One such treatment is Chimeric Antigen Receptor (CAR) T cell therapy. Due to heterogeneous antigen expression, an immunosuppressive tumor microenvironment, and potential for tumor antigen escape, CAR T cells that have shown promising results against other pediatric cancers have not had similar success treating AML. Through the addition of dual antigen specificity and two co-stimulatory domains, we aimed to design a CAR T cell that is safe, potent, and persistent. We modified the pre-existing CD70 and B7H3 CAR T cells to create a novel bicistronic CAR. This study focuses on the generation, function, and immunophenotypic characterization of the CD70*B7H3 CAR T cell for treating pediatric AML.

P13 Formalizing the Sylow Theorems in Homotopy Type Theory Based Agda

Student Researcher: William Brice ’25
Major: Mathematics
Faculty Collaborator: Joseph Rennie, Mathematics and Computer Science

Computer formalization is a tool that, if well utilized, can save mathematicians time by verifying proofs, checking for errors, managing complexity, and many other tasks that would otherwise take time away from doing math[Avigad 2024]. This goes hand in hand with Large Language Models(LLMs), which are already being used to formalize math without requiring direct input from mathematicians[Trinh et al. 2024]. These LLM-based approaches have primarily used Martin-Lof theory as their mathematical frameworks, but we cannot afford to neglect others such as Homotopy Type Theory if we wish to train models capable of doing research-level mathematics. It’s important to investigate the skills an LLM would need to properly work in research-level math. Although they are no longer at the forefront of research, the Sylow Theorems offer a good viewpoint into what these skills may be. This is due to them being understandable theorems with proofs bridging multiple mathematical disciplines and being important to Group Theory, a central component of mathematical research. In this project we begin the process of formalizing the Sylow Theorems in HoTT to understand what mathematical skills an LLM would need to properly work in Group Theory in an unfamiliar context like HoTT.

P14 Injunctive Relief in Patent Cases: the Impact of *eBay*

Student Researcher: Meryl Goodwin ‘26
Major: Mathematical Economics
Faculty Collaborator: Kristina Acri, Economics and Business

The U.S. Supreme Court’s 2006 decision in *eBay Inc. vs. MercExchange LLC* was a pivotal moment for patent enforcement and policy. Before this ruling, it was widely believed that lower courts often granted injunctions in patent infringement cases as a matter of routine. However, Chief Justice Kennedy's concurrence in this case highlighted concerns about non-practicing entities (NPEs) and rejected the automatic granting of permanent injunctions. This raises the question: do courts give preferential treatment to practicing entities over NPEs when deciding on injunctions? Favoritism toward operating companies could weaken the bargaining power of NPEs in litigation and licensing negotiations. This study examines all patent cases filed in U.S. District Courts from 2000-2023 that involved motions for either preliminary or permanent injunctions. By comparing the frequency and success rate of these motions before and after the *eBay* ruling, the analysis found a significant reduction in both requests for and grants of injunctions post-*eBay*. Specifically, requests for permanent injunctions declined by 87.4% for NPEs and 65.0% for operating companies, while preliminary injunction requests fell by 48.4% and 53.2% respectively. The study concluded that the *eBay* decision had a profound impact on the availability of injunctions, particularly affecting NPEs more than operating companies. This paper underscores the unique role of injunctions in patent cases and emphasizes the significance of the *eBay* ruling on this critical legal remedy.

P15 Isolating the Pockets of Protein-Protein Interactions

Student Researcher: Charlie Rothschild `27
Major: Computer Science
Faculty Collaborator: Cory Scott, Mathematics and Computer Science

A machine learning model capable of predicting potential drug candidates shows promise in leading to the acceleration of drug discovery. The model must be capable of generating proteins that will attach to inputted binding sites and achieve an inputted set of chemical effects. This requires a dataset of known binding sites, or pockets of Protein-Protein Interactions (PPIs) that can be used to train the model. A dataset of PPIs already exists, but the pockets of those PPIs need to be isolated. The goal of this project was to convert the PPI dataset into a dataset of binding sites. This was achieved using an algorithm that measured how close each atom in one protein was to the other protein involved in the interaction. Each atom that was below a certain distance threshold was selected by the algorithm. The surfaces of the selected atoms were displayed and the atoms were hidden. The displayed surfaces were saved as a .STL file. The resulting file was a 3D mesh containing the surfaces of each protein involved in the PPI. This algorithm can be ran on all 2 protein PPIs in the PPI dataset, resulting in a set of .STL files that can be used as training data for the protein analysis model. This model is significant to future research in producing potential drug candidates that can achieve desired therapeutic effects.

P16 Recap

Student Researcher: Brooktie Frogge `26; Erin Liedeker `26; Josh Parks `27
Majors: Computer Science; Computer Science; Computer Science
Research Collaborators: Dr. André van der Hoek and Dr. Adriana Meza Soria
Faculty Collaborator: Janet Burge, Mathematics and Computer Science

Meetings are a crucial aspect of collaboration, yet effectively capturing and utilizing information from them remains a challenge. The Distributed, Fragmented Software Design Meetings project seeks to address this by studying how information is shared, captured, and retrieved during software development meetings. As part of this initiative, we developed *Recap*, a tool designed to enhance the accessibility of meeting data collected using *Knocap*, an existing meeting capture system. *Recap* enables users to browse and search meeting information efficiently through intuitive sorting filters and tagging features. Building on existing user stories, we designed *Recap* to prioritize key functionalities while introducing new features to improve usability. During the process, we encountered challenges like redundancy in data collection and feature overlap, which we resolved through careful design refinements. Moving forward, usability studies will assess how well *Recap* supports real-world tasks, guiding further improvements to make meetings more efficient and effective.

P17 The Desert Dispute: Water Policy in the Colorado River Basin and Urban Appropriation of Rural and Indigenous Resources

Student Researcher: Ethan Stewart ’25
Major: Economics
Faculty Collaborator: Michelan Wilson, Economics and Business

Although the effects of climate change and environmental overexploitation have increasingly been felt around the United States, nowhere in the nation have these incidents become more pressing than in the Colorado River Basin. Despite attempts to reformulate frameworks governing water allocations, the policies passed throughout the mid-20th century making up the “Law of the River” are inadequate to address worsening instances of drought, environmental degradation, and resource scarcity. This is particularly pressing for the rural areas and indigenous communities throughout the basin that are systemically deprioritized in water rights negotiations and access as compared to more politically powerful urban areas. To assess the impacts of this urban-rural division throughout the basin, this study investigates four case studies in Arizona, Colorado, Nevada, and the Navajo Nation. Through a qualitative analysis of each case as well as a proposed survey, the extent and prevalence of this issue across the Basin and possible solutions are proposed. Since most policymakers and public attention often remain focused on individual states’ allocations and arguments by some that they are disadvantaged by existing water rights agreements, this study seeks to highlight previously understudied inequities and work towards comprehensive solutions to be incorporated into more effective future policy.

P18 Purine Salvage Enzymes are Regulators of Immunity in Caenorhabditis Nematodes

Student Researcher: Mona Hamad ’25
Major: Molecular Biology
Faculty Collaborator: Spencer Gang, Molecular Biology

Microsporidia are fungal intracellular parasites of many animals, including Caenorhabditis nematodes. Prior research in C. elegans has demonstrated that loss of Ce-pnp-1 (an ortholog of human purine nucleoside phosphorylase (PNP)) or Ce-adah-1 (an ortholog of adenosine deaminase (ADA)) will induce a host innate immune program coined the Intracellular Pathogen Response (IPR) that promotes resistance to microsporidia. Ce-pnp-1 and Ce-adah-1 function in the purine salvage pathway and convert purine nucleosides into free bases. Microsporidia lack mitochondria and thus are hypothesized to acquire purine nucleotides from their host to facilitate intracellular growth and development, thus suggesting a connection between host surveillance of purine concentrations and activation of the IPR. However, whether these purine salvage enzymes act as immune regulators in other nematode species is unknown. Here, we asked if orthologs of Ce-pnp-1 and Ce-adah-1 have conserved immune roles in C. briggsae, a sister species of C. elegans. To investigate Cbr-pnp-1 and Cbr-adah-1, we optimized RNA interference (RNAi) conditions in C. briggsae by first targeting the Cbr-unc-22, which induces a visible “twitching” motility phenotype. Next, we developed plasmid vectors for RNAi knock-down of Cbr-pnp-1 and Cbr-adah-1 and transformed them into HT115(DE3) E. coli. RNAi was induced by the feeding method and subsequent RT-qPCR revealed the upregulation of known immune genes also induced by microsporidia infection in C. briggsae, supporting our hypothesis. Next, we will perform microsporidia infection assays after RNAi treatment to determine if knock-down of Cbr-pnp-1 and Cbr-adah-1 promotes resistance, as observed when the C. elegans IPR is activated.

P19 Solvating Electrons in Liquid Ammonia using Atmospheric-Pressure Plasma

Student Researcher: Andrew Biesiada`26
Major: Physics
Research Collaborator: Mason Gardner
Faculty Collaborator: Adam Light, Physics

The production of solvated electrons at the plasma/liquid interface is an important and little-understood part of many atmospheric-pressure plasma applications. In liquid ammonia, solvated electrons have a lifetime of days, compared to that of microseconds in water. Their broad absorption band provides a way to measure the concentration of solvated electrons, but the signal from one plasma pulse is often negligible. Long lifetimes in ammonia allow a large cumulative signal to be detected even if the number of electrons injected in each plasma pulse is too small to measure. We use repeating nanoseconds-long high-voltage pulses to inject current into a liquid ammonia anode and collect absorption data at 1550nm as a function of time. We present our setup and preliminary measurements of solvated electron concentration.

P20 The Role of the RNA-Binding Protein MBL-1 in Neuron Morphology in *C. elegans*

Student Researcher: Brayden Legette `25
Major: Molecular Biology
Research Collaborators: Liz White, Meena Kim, Sadie Fleig, Nick Bradley, Talyn Snow
Faculty Collaborator: Darrell J Killian, Molecular Biology

Neurons are cells of the nervous system that are responsible for the communication of sensory or synaptic information. Defects in neuron morphology impair neuronal function and are associated with neurological disorders. Therefore, an understanding of the genetic regulation of neuronal morphology is important. The *Caenorhabditis elegans* PVD neuron is an excellent study system due to its complex morphology in an organism that is amenable to genetic manipulation and live imaging. The *C. elegans mbl-1* gene encodes an RNA-binding protein (MBL-1) that is predicted to regulate alternative RNA splicing. Loss of *mbl-1* produces a nervous system phenotype characterized by defects in dendrite patterning and synapse formation. We found that *mbl-1* mutants exhibit reduced terminal branching of the *C. elegans* PVD sensory arbor, with terminal branching becoming progressively more sparse with increasing distance from the cell body. We also found that PLMs have longer axons, and the location of their synapse is shifted closer to the cell body in the *mbl-1* mutant. To learn more about the molecular function of MBL-1 protein, we are working on an experimental strategy called TRIBE (Targets of RNA-binding proteins Identified By Editing) aimed at learning which mRNAs are bound and regulated by MBL-1. The identification of MBL-1 mRNA targets will allow us to learn the molecular basis for how MBL-1 contributes to neuron morphology.

P21 Investigating the Source of Counter-Rotation in Low-Mass Galaxies

Student Researcher: Dominic Schwein`26
Major: Physics
Faculty Collaborator: Catherine Witherspoon, Physics

Angular momentum is acquired early on during galaxy formation, so we expect that in most cases, the stellar and gaseous kinematics are well-aligned. However, observations have shown that this is not the case in all galaxies. Possible causes of this kinematic misalignment include feedback from active galactic nuclei (AGN), gas transfers during galaxy fly-bys, and the accretion of new gas via galactic mergers. We refer to this misalignment as counter-rotation and create a program that estimates the kinematic offset angle between stellar and gaseous components. We compare the kinematic offsets of 94 low-mass galaxies that are characterized by potential AGN emission to those of a broader sample of ~3000 low-mass galaxies, with both sets of galaxies having been observed by the SDSS-IV MaNGA survey. We also look for correlations between kinematic offset angle and quantities such as morphology, AGN accretion rate, star formation rate, stellar and gaseous maximal velocity, and HI-mass. We find that ~24% of non-AGN galaxies are counter-rotating, while ~52% of AGN galaxies are. Additionally, ~64% of AGN galaxies display a kinematic offset greater than 30 degrees. This trait is only possessed by ~39% of non-AGN galaxies. This lends support towards AGN feedback as a possible avenue for the formation of kinematic offsets in low-mass galaxies.

P22 Green Solvent Optimization for Solid-Phase Peptide Synthesis of a *Pseudomonas Aeruginosa* Prodrug

Student Researchers: Cate Rosenbaum ’25; Ollie Beland ’25; Ty Kruger `25; Trenten Chalik `26
Majors: Chemistry; Chemistry; Biochemistry; Chemistry
Faculty Collaborator: Amy Dounay, Chemistry and Biochemistry

Pseudomonas aeruginosa is an opportunistic pathogen that, due to a high degree of antibiotic resistance, commonly affects immunocompromised individuals – particularly those with cystic fibrosis. A prodrug containing 4-fluoro-L-phenylalanine (4-FPhe) designed to target the LecA and LecB enzymes present in *P. aeruginosa* biofilms, minimizes cytotoxicity and maximizes antimicrobial activity. A key component of this prodrug is a pentapeptide containing 4-FPhe. Solid phase peptide synthesis (SPPS) commonly utilizes dichloromethane (DCM) for resin loading, and *N,N*-dimethylformamide (DMF) for acylation. Both solvents are acutely toxic and hazardous. SPPS optimization focused on identifying green, cost-effective, and accessible solvent alternatives. Resin loading was completed with Acetonitrile/ethyl acetate (EtOAc) (1:1). Previous acylation reactions in EtOAc were inefficient and produced minimal yield. Six binary solvent mixtures with similar polarities to DMF were assessed. Dimethyl sulfoxide (DMSO)/2-methyltetrahydrofuran (2-Me-THF) (3:7) and DMSO/1,3 – dioxolane (DOL) (4:6) significantly improved reaction times and yields.

P23 Grade Inflation: The Causes and Effects in Different Grading Systems

Student Researcher: Teddy Libby `25
Major: Psychology
Faculty Collaborator: John Horner, Psychology

Grade inflation has steadily increased over the past decades, leading to concerns about the current grading practices in academia. The US Department of Education reported a 12% increase in the average GPA of college students across the United States over the past 30 years, from a 2.81 average in 1990 to a 3.15 average in 2020 (Nam, 2023). While average GPAs have been steadily increasing, the time students spend studying per week has fallen drastically, decreasing by 50% over the past four decades (Winship, 2011). 35% of college students across the United States now allocate less than five hours a week to their studies. Private nonprofit institutions, such as Colorado College, have seen a 16% growth in average GPA since 1990 (Nam 2023). Variables have been proposed to account for grade inflation, including Student Evaluations of Teachers (SETs), the desire to avoid conflict between professors and students, internal and external competition for students, shifting educational philosophies, and external pressures on faculty to give students passing grades. This review examined how these variables have contributed to the rise of grade inflation, as well as how traditional grading, standards-based grading, normative grading, and alternative grading systems have dealt with rising GPAs.

P24 Queer Temporalities: the Colorado College LGBT Oral History Project Revisited

Student Researcher: Samuel Nystrom Costales `25
Major: History-Philosophy
Faculty Collaborator: Jake P. Smith, History

Our research project, "Queer Temporalities: the Colorado College LGBT Oral History Project Revisited," transcribed and analyzed oral histories collected by students at CC in 2013. We aimed to transform an underutilized archival collection into an accessible resource for future students. The project explored diverse queer experiences at Colorado College, ranging from post-war Germany and Himalayan boarding schools to local car dealerships in Colorado Springs. Using these materials, we critically engaged with theoretical frameworks in queer studies, memory politics, and the philosophy of history. Our analysis challenged the conventional narrative of queer rights as a linear progression of liberation; we traced shifts in queer discourse that demonstrate a transition from systemic rupture to seeking recognition within the existing intersections of heteronormativity and capitalism— ultimately relating these changes to the institutional context of Colorado College and queer discourse more broadly.

P25 Sex Hormones and Rapid Dendritic Spine Neuroplasticity in Songbirds

Student Researchers: Nicole Peirson`25; Chris Gruschow `26
Majors: Neuroscience; Neuroscience
Faculty Collaborator: Marcela Fernandez-Vargas, Psychology and Neuroscience

In zebra finch songbirds, exposure to novel bird song can upregulate spine density in auditory neurons. Additionally, a synthesis in neuroestrogens (E2) was found to occur during the song exposure. While previous studies have determined that novel birdsong can increase spine density, little has been done to determine if hormones, like E2, are partially responsible for this upregulation. This study used an aromatase inhibiting drug, Fadrozole (FAD) to block the synthesis of E2 to determine if E2 is partially responsible for the upregulation of spines in male zebra finches. Four variable groups were used in this experiment: song + vehicle, song + FAD, silence + vehicle, and silence + FAD. We expect the song + vehicle group to have the highest spine density. For the experiment, each bird was orally administered FAD or vehicle and exposed to 30 m of novel songs or silence. Following an hour, the bird was euthanized, the brain was perfused, extracted, and stained with a rapid Golgi staining protocol. Once stained, the brain was sliced and mounted on slides. Neurons were then imaged at 60x (z-stack) and traced using the Neurolucida program. Results from a Sholl analysis will be reported for the auditory region, caudomedial nidopallium, and discussed in relation to previous work done in the laboratory at CC.

P26 Electrode Material Comparison for Potential UV-Triggered Spark Gap

Student Researcher: Eveline Tholen `25
Major: Physics
Faculty Collaborator: Adam Light, Physics

We present progress towards a UV-LED-triggered spark gap as part of our search for a relatively inexpensive solution for fast high-voltage switching (rise times of GV/s). The challenge lies in the uncontrolled timing that is characteristic of spark gaps. Current methods involve pricey laser-triggered spark gaps, which use photoionization to solve the timing jitter. This project evaluates the feasibility of triggering the spark gap through photoemission from the cathode instead. We use a pulsed 270nm LED to eject electrons from the cathode in hopes of seeding a sub-threshold discharge. We present the current status of the project and questions that remain to be answered. In particular, we address the duration and energy of the UV pulses and compare the performance of varying electrode materials with different work functions. While the material of the electrode does impact the effectiveness of the pulsed UV light, there is a clear indication that lower pulse widths and lower pulse frequencies improve the average jitter with respect to the UV pulse.

P27 Algebra of Small Chemical Reaction Networks

Student Researcher: Maddy Spark `26
Major: Physics
Faculty Collaborator: Luis David Garcia Puente, Mathematics and Computer Science

Chemical reaction networks (CRNs) are used to model interactions between sets of objects called species. The theory is based in traditional chemistry; however, it has applications to mathematical biology and pattern formation. Our studies were focused on how these networks form mass action systems consisting of steady-state ideals after being turned into systems of ordinary differential equations. From there we focused on non-vacuous absolute concentration robustness (ACR), a characteristic of CRNs that describes a certain simplicity of its steady state variety and that may contribute to understanding how systems maintain function in fluctuating environments. We looked for possible conditions for ACR by first determining which systems had ACR and looking for patterns among their stoichiometric matrices, ordinary differential equations, and ideals. Then we tested hypothesized conditions for ACR by computationally and manually checking all networks in a category of CRNs. We found that all 2-reaction systems with non-vacuous ACR had zero-divisor ACR, and that the zero-divisor condition was sufficient and necessary for ACR in all 2-reaction systems.

P28 Analysis of Cognitive Function in Colorado College Students in Correlation with Carbon Dioxide Levels

Student Researcher: Grace Nguyen `26
Major: Neuroscience
Research Collaborators: Gabe Katz, Cathy Xiao, Estefania Izarnotegui Cerda, Maggie Nguyen
Faculty Collaborator: Sally Meyer, Chemistry and Biochemistry

Literature suggests that exposure to high levels of carbon dioxide affects cognitive function negatively through cognitive assessments. Previous studies were only conducted on office workers, pilots, students across all education levels, and astronauts in environments such as submarines, elementary and high school classrooms, and office buildings. These studies used the cognitive test software, SMS (Strategic Management Simulation), to measure cognitive performance. For this study, we are localizing it to Colorado College students, measuring the carbon dioxide levels in their bedrooms. Students tested their cognitive function through the Stroop test, which measure interference with executive functioning, to see if decreased cognitive function correlated with high levels of carbon dioxide. The Stroop test is a quick and efficient way of measuring cognitive function, much more so than the SMS software test that is 1.5 hours long. The seven participants each did three trials of collecting carbon dioxide data through the Temtop monitors and taking different versions of the Stroop test for each trial with their windows closed. Using a 2-sample T-test, we determined that Stroop test scores – therefore, cognitive function - decreased with higher levels of carbon dioxide and with those living on Colorado College's campus, although these findings were not significant.

P29 Comparative Analysis of Innate Immune Responses to Microsporidia Infection Between Two *Caenorhabditis* Nematode Species

Student Researchers: Caroline Bay`26; Joselyn Campuzano`25
Majors: Molecular Biology; Molecular Biology
Faculty Collaborator: Spencer Gang, Molecular Biology

Microsporidia are obligate intracellular fungal pathogens infecting numerous eukaryotic hosts, including *Caenorhabditis* nematodes. Among them, *Nematocida parisii* naturally infects *Caenorhabditis elegans*, inducing the host transcriptional Intracellular Pathogen Response (IPR). The IPR involves the upregulation of many genes, notably *pals* gene family members, involved in pathogen recognition and immune defense. The IPR is well-studied in *C. elegans,* but its conservation across related species is poorly understood. *Caenorhabditis briggsae,* biologically similar to *C. elegans*, provides a useful comparative model. While *N. parisii* infects both species, the degree of susceptibility to infection between the two hosts was unclear. We used quantitative fluorescence in situ hybridization (FISH) analysis to compare pathogen load and determined that *C. elegans* and *C. briggsae* are similarly susceptible to *N. parisii*. We next asked if *C. briggsae pals* genes are similarly induced during infection as observed in *C. elegans.* To test this, we infected *C. briggsae* with *N. parisii* and performed qRT-PCR for 8 of the 11 *pals* genes identified in this species, revealing an upregulation of select genes. Existing research and our RT-qPCR data informed the selection of two highly induced *pals* genes, and we constructed transcriptional GFP reporters to visualize the *C. briggsae* immune response during *N. parisii* infection. With our development of *C. briggsae* transcriptional reporters, our next step will be to perform forward genetic screens to identify regulators of the *C. briggsae* immune program.

P30 Mapping [NII] Emission Across the Milky Way, But We Have Preliminary Analysis So It's Different

Student Researcher: Joshua McFeeters`25
Majors: Physics, Art History
Faculty Collaborator: Dhanesh Krishnarao, Physics

While the WHAM (Wisconsin H-Alpha Mapper) is primarily known for its successful mapping of diffuse Hα emission in the Milky Way, WHAM additionally observes a variety of other faint optical emission lines, including that of ionized nitrogen ([NII]) and ionized sulfur ([SII]), which are important when evaluating effects of both temperature and ionization state of the Warm Ionized Medium (WIM; diffuse gas of approximately $T \sim 10^4$ K within the Milky Way). Using over 27 hours of archival data from faint regions of the southern sky (where observed emission is solely a result of atmospheric emission), we construct an atmospheric profile that efficiently facilitates the removal of atmospheric emission from Galactic emission of [NII] taken by WHAM. We developed an automated process that has reduced over 17,000 spectra taken from October 2009 to present day. Here, we present the results of our reduction process, a large area Galactic map of [NII] emission over the Milky Way Galaxy, focused over the southern sky. Additionally, we present a preliminary analysis of the [NII] emission with WHAM's Hα data. In the future, we will extend this method to other lines, like [SII], within WHAM's archive, which we hope to soon publish and release to the public.

P31 Spatial Feedbacks and External Pressures in Rybník Rod: Understanding Alternative Stable States and Regime Shifts Between Macrophyte and Cyanobacteria Dominance

Student Researcher: Olivia Spencer`24
Major: Environmental Science
Research Collaborator: Emily Marple and Lucy Hylton collaborated in the field
Faculty Collaborator: Miro Kummel, Environmental Science Program

Focusing on transitions between macrophyte-dominated and cyanobacteria-dominated states, this study investigates the temporal and spatial dynamics of alternative stable states in Rybník Rod. Weekly mapping of percent macrophyte ground cover, chlorophyll, and cyanobacteria distribution provides insights into the spatial heterogeneity and regime shifts within the lake. Macrophyte cover peaked on July 8 before declining sharply, while cyanobacteria and chlorophyll concentrations followed an inverse pattern. Spatial analysis revealed distinct patches influenced by various external pressures, such as inflow from the adjacent Rybník Naděje and a bog-fed bay. Correlation analysis of environmental variables (cyanobacteria, chlorophyll, pH, dissolved oxygen, turbidity, etc.) between stations investigates the internal mechanisms of each station. The results demonstrate the role of spatial feedback and external disturbances in driving regime shifts. They suggest that Rybník Rod may be transitioning between alternative stable states under the influence of these ecological pressures.

P32 Dendritic spine formation in female songbird auditory neurons in response to novel song exposure estradiol

Student Researcher: Deliannys Reyes`25
Major: Psychology
Faculty Collaborator: Marcela Fernandez-Peters, Psychology and Neuroscience

Neuroestrogens rapidly enhance dendritic spine formation and functional connectivity in regions critical for cognition, learning, and memory. In songbirds, estrogen-dependent plasticity influences brain regions involved in vocal communication during development. Moreover, 30-minute exposure to novel songs rapidly increases spine density in auditory regions in males. Song exposure also stimulates rapid estrogen synthesis in zebra finch auditory areas. However, estradiol's effects on dendritic spine formation in females remains unstudied. In males, we have found evidence of that song and estradiol can upregulate dendritic spines at distal parts of the neuron. We hypothesize that novel song exposure, with estradiol, induces rapid dendritic spine plasticity in females as well. Birds were divided into four groups: (1) song + estradiol, (2) song + peanut oil, (3) silence + peanut oil, and (4) silence + estradiol. Estradiol or peanut oil was administered orally, followed by 30 minutes of song or silence. Brains were perfused, extracted, and stained with Golgi to visualize neurons. We used *Neurolucida* to trace neurons (blind to groups) and quantified spine density. Preliminary findings suggest that unlike males, neither novel song nor estradiol enhance neuroplasticity in the female lateral nidopallium. This study suggests that there are sex differences in dendritic plasticity and auditory processing.

P33 Barhopping between Galaxies: Azimuthal Variations in Barred MaNGA Galaxies

Student Researchers: Aliana Istanbullu`26; Patrick Loos `25
Majors: Physics; Physics
Faculty Collaborators: Dhanesh Krishnarao, Physics; Catherine Witherspoon, Physics

Galactic bars, prominent structures in many spiral galaxies, significantly contribute to the evolution of galaxies by funneling gas from the outer regions to the core, which can fuel star formation and influence galactic structure and chemical composition. While bars may increase star formation rates and trigger active galactic nuclei (AGN) in some cases, their overall effect of star formation and metallicity remains debated, with differing results depending on galaxy type, bar strength, and length. Some studies suggest bars are more common in redder, passive spirals, while others show mixed findings on their impact on stellar population and galaxy morphology. However, azimuthal variations of galaxy parameters and their relationship to bars is not well known. With a sample of SDSS-IV MaNGA galaxies, we analyze how different parameters vary with azimuth in a range of barred galaxies. The goal of our research is to compare the azimuthal variations we found with predictions from galaxy simulations. Our research also provides insight into the correlation between galaxy properties and dark gaps, which are regions in barred galaxies where there is a significant decrease in light along the bar’s minor axis compared to its major axis, resulting in a seemingly darker region.

P34 pyonized: Python Package for Modeling Ionized Gas

Student Researcher: Sean D. Lam ’27
Majors: Physics and Chemistry
Faculty Collaborator: Dhanesh Krishnarao, Physics

Diffuse Ionized Gas (DIG) constitutes a significant portion of the ionized interstellar medium, influencing the dynamics and energy balance of galaxies. Understanding the structure and kinematics of DIG is crucial for interpreting the large-scale behavior of galaxies, as well as the processes that drive star formation and feedback. However, predicting and modeling DIG kinematics poses challenges due to its low density and the limitations of current observational data.To address these issues, we created *pyonized*, a Python package in development, designed to model DIG in four dimensions – 3D space plus velocity. The primary objective of *pyonized* is to simulate the DIG from physical conditions of the gas (temperature, density, distribution, and kinematics), providing insights into the structure and dynamics of ionized gas. These models can be compared with observations from WHAM (Wisconsin H-Alpha Mapper) and SDSS-LVM (Local Volume Mapper) along with recent 3D dustmaps. Currently, the package operates in one spatial dimension, with plans to extend its capabilities to full 4D modeling. By allowing customization of spectra, dustmaps, and extinction parameters, *pyonized* aims to become a flexible tool for researchers studying the ISM and DIG kinematics. The package is open-source and in the process of documentation for public use.

P35 High Resolution Drone Imagery for Macrophyte Mapping in Shallow Lakes

Student Researcher: Emily Marple `25
Majors: Organismal Biology and Ecology
Research Collaborators: Lucy Hylton, Olivia Spencer
Faculty Collaborator: Miro Kummel, Environmental Science Program

Lakes often exist in one of two alternative stable states: a clear-water macrophyte dominated state or a turbid phytoplankton-dominated state. Submerged macrophytes are essential to maintaining the clear water state, as they support nutrient cycling, reduce algal blooms, and stabilize sediment. However, traditional macrophyte mapping methods are labor-intensive and limited in spatial resolution, making it difficult to study large scale patterns and transitions between stable states. This study evaluates the feasibility of using drone-based imagery to map macrophytes in shallow lakes as an alternative to traditional field-based methods. Research was conducted in the Třeboň Basin on Rybník Rod in the Czech Republic, using a weekly Mavic Pro multispectral drone survey and weekly macrophyte “ground truth” survey using a boat, taking ~140 data points. Initial results indicated no significant correlation between drone-derived and ground truth data, but methodological refinements, including the exclusion of outliers and low-visibility submerged species, improved the correlation coefficient to 0.44. Limitations, such as the inability to detect submerged macrophytes below the water surface and interference from reflections, were identified and explored. Despite these challenges, drone imagery demonstrated potential for providing high-resolution spatial data over large areas. This study highlights both the opportunities and limitations of using drones to monitor shallow lakes and suggests ways to improve accuracy.

P36 Assessing *Drosophila* as a Model Organism for Fatty Acid Oxidation Disorders

Student Researcher: Abby Heimerl `25; Juliana Geronazzo `25
Majors: Molecular Biology; Molecular Biology
Research Collaborator: Seattle Children's Hospital (Anna Scott)
Faculty Collaborator: Meredith Course, Molecular Biology

Fatty acid oxidation disorders (FAODs) are a large category of metabolic disorders that vary in severity from asymptomatic to causing sudden infant death syndrome (SIDS). These disorders are largely understudied, and establishing a model organism is essential to understand their molecular mechanisms. CRISPR/Cas9 was used to knock out six genes in *Drosophila* predicted to be the orthologs of human genes implicated in FAODs. The presence of mutations were confirmed through Sanger sequencing, and the metabolic profile of these mutants were analyzed through acylcarnitine analysis. The acylcarnitine profile of the *Mcad* knockout flies resembled that of humans with an *ACADM* deficiency. The acylcarnitine profile of the *Arc42* mutant flies resembled that of humans with a *ACADS* deficiency, but the *CG4860* mutant flies did not, suggesting that *CG4860* is not the ortholog of *ACADS*. A single amino acid deletion in *Mtpa* resulted in some detrimental effects, being the likely ortholog of *HADHA*. Mutations in *ETF-QO* and *CG7834* were homozygous lethal in flies and are the likely orthologs of *ETFDH* and *ETFB*. Utilizing the tractability of *Drosophila* to generate a model organism for FAODs will advance research on these disorders.

P37 CO_2 Concentration Measurement and Modeling for Prediction of SARS-CoV-2 Infection Probability in an Uncontrolled Fitness Facility

Student Researcher: Gabriel Katz `25
Major: Biochemistry
Faculty Collaborator: Sally Meyer, Chemistry and Biochemistry

The COVID-19 pandemic has highlighted concerns about airborne disease transmission in public spaces, particularly in fitness centers where respiratory output is elevated. This study investigates the likelihood of contracting three SARS-CoV-2 variants (Alpha, Delta, and Omicron) in an operational fitness center without environmental controls. Using a TEMTOP CO_2 monitor, we collected data throughout the day as patrons exercised and overnight after closure. The data reveals peak CO_2 levels, indicating higher occupancy, at specific times and days. We quantified the building's ventilation rate (Q) by analyzing the linearized CO_2 decay upon facility closure. This rate is crucial for the Wells-Riley model, the most widely accepted model which we used to calculate infection probabilities for each variant. We calculated quantitative data on various factors, including increased output of infectious quanta (q) and elevated pulmonary ventilation rates (p) corresponding to different activity levels. Our results provide evidence-based recommendations for immunocompromised individuals and those more susceptible to infection, allowing them to reduce their infection risk by choosing optimal times and days to visit fitness facilities.

P38 The Impact of Testosterone on the Response to Novel Songs in Songbirds

Student Researchers: Anna Matsui `25; Clara Lippert `26
Majors: Neuroscience; Neuroscience
Faculty Collaborator: Marcela Fernandez-Peters, Psychology

Previous work in this lab has researched the impact of hormones on auditory processing of novel songs in zebra finches. The NCM is a secondary auditory region and previous work has shown brain activation in this area in response to song-related behaviors. Moreover, testosterone can be produced in the NCM when female zebra finches hear song. This summer, we used flutamide, an anti-androgen drug that blocks testosterone synthesis with the goal of identifying the impact of testosterone on the response to novel songs. We examined the combined effect of oral administration of flutamide or vehicle and the exposure to novel songs or silence in female zebra finches (four experimental groups). We expected that flutamide would decrease brain activation to song. We measured the molecular marker of PS6, a protein that is phosphorylated when neurons are active using Immunocytochemistry (ICC). We quantified PS6 presence in the caudolateral and caudomedial nidopallium (NCL and NCM). Conversely, the NCL is not as well-researched, but it has connections to the NCM. We found no significant evidence that flutamide impairs brain activation to song. Thus, androgen receptors in auditory regions are not involved in song-evoked activation in female zebra finches.

P39 David Foster Wallace and Figuring Corporeality

Student Researcher: Connor Rogers `25
Major: Comparative Literature
Faculty Collaborator: Corinne Scheiner, Comparative Literature

David Foster Wallace often challenges a notion of subjectivity governed by stark Cartesian mind-body dualism across his fiction and nonfiction. Before the 2011 posthumous release of Wallace's unfinished novel *The Pale King*, this treatment of Cartesian dualism had notably taken form as an encounter with the abject in his 2004 short story "The Suffering Channel," or as writing characters who misjudge selfhood as belonging to one side of the mind/body binary, such as James Orin Incandenza Sr. in Wallace's monumental 1994 novel *Infinite Jest*. Both problematize a notion of subjectivity rooted in Cartesian dualism but produce confused and fractured subjects hurtling toward unintelligibility and oblivion. Wallace's later fiction posits a corporeal subject that understands the self as the nexus of body and mind, possessing neither exteriority nor interiority, and perpetually generative of the self vis-à-vis recursion and reiteration.

P40 Maximum Likelihood Estimations and Model Fitting in Calculus Classes

Student Researcher: Zoe Harrington `25
Major: Mathematics
Faculty Collaborator: David Brown, Mathematics and Computer Science

Applications optimization in calculus classes often follow a similar bland script, for example calculating the maximum area for a farmer given fencing restriction. In contrast, the ideal guided inquiry problem in calculus classes generates curiosity, broadens the students understanding of the relevance of calculus, while meaningfully integrating the intended learning goals. This project highlights the out-reaching qualities of mathematics for students of any level of investment in the subject by introducing the method Maximum Likelihood Estimation (MLE) to the calculus classroom. MLE is an upper-level statistical method that is used to estimate the parameters of a statistical model. It uses the method of optimization learned in calculus to compute the "best fit" parameters. Due to the generality of the MLE method, these problems can be tailored with different datasets to target to the instructor's audience and find relevance for students learning. This project presents a repository of worked examples, teacher materials, a bank of guided-inquiry problems and answer keys that utilize pedagogically sound curriculum practices and an equity-based approach to learning.

P41 Influence of Ectomycorrhizal Decomposition in Pinyon-Juniper Woodlands

Student Researcher: Sadie Fleig '25
Major: Molecular Biology
Research Collaborator: Dr. Rae Devan, University of New Mexico Biology Department, NSF Sevilleta Field Station REU

Litter decomposition is one of the most fundamentally important ecosystem functions, as it directly impacts both the atmosphere and soil health. The Gadgil effect is a theory positing that ectomycorrhizal fungi (EMF) compete with saprotrophs for litter decomposition, slowing decomposition and subsequent release of carbon into the atmosphere, as well as diverting resources to their hosts, increasing autotrophic carbon sequestration. Though this has been tested in boreal forests, there is a lack of information on arid land mycorrhizae, particularly within pinyon-juniper woodlands, which respectively have EMF and arbuscular mycorrhizal fungi. Pinyons are dying off across the Southwest, limiting the amount of EMF in the landscape. The Tea Bag Index was utilized to test decomposition rates at varying soil depths in three ecosystems with a range of pinyon die-off, with soil cores collected, and EMF cultured and amplified by PCR. Comparison of tea bag decomposition rate among sites by trenching and depth indicated differences between the untrenched control and trenched plots at the healthy pinyon-juniper site at 5 cm. This indicates that cutting off EMF within that depth scale significantly decreases the decomposition rate of litter, showing that the Gadgil effect may be more variable in a range of climatic contexts.

P42 Dormancy and light dependent germination responses to smoke and gibberellin in *Liatris punctata*

Student Researcher: Cori DeLano `25
Major: Organismal Biology and Ecology
Faculty Collaborator: Shane Heschel, Organismal Biology and Ecology

Liatris punctata (Asteraceae), a perennial forb native to north America, occupies a diverse range of dry plains fire regimes, including the Minnesota plains, Colorado montane, and California chaparral. Smoke-derived furanone has been shown to mimic the effects of germination hormone gibberellin (GA) across many species. Furanone has been found to increase germination of *L. punctata* in CO native seeds but reduce germination in MN native seeds. Its effects on CA chaparral seeds, its interaction with GA, and concentration-dependent responses remain unknown. Horticultural seeds from Fallbrook, CA were treated with a combination of GA and furanone at three different concentrations. After seven days of incubation, there was no significant effect of furanone alone, but significant interaction effects between GA and furanone. The presence of GA results in a positive relationship between furanone concentration and germination, while the absence of GA results in a negative relationship between furanone concentration and germination. These findings suggest that post-fire regeneration of *L. punctata* in the high intensity fire chapparal ecosystem may depend on optimal water, light, and temperature conditions.

P43 Working Towards Unsmoother Meshes

Student Researcher: Dan Schmidt `25
Majors: Computer Science
Faculty Collaborator: Cory B. Scott, Mathematics and Computer Science

This project explores the development of a machine learning model designed to "unsmooth" 3D meshes, enabling controlled texture alteration and generation. By leveraging techniques similar to denoising in 2D stable diffusion image generation, this approach aims to provide tools for artists, designers, and researchers in 3D model texture synthesis. The model demonstrated the capability to transform smooth meshes into rough ones, offering promising results through the application of eigenvector-based mesh structure analysis. While the pipeline successfully established a foundation for mesh transformation, challenges were identified in achieving coordinate precision, feature control, volume consistency, and handling extreme geometries. These findings highlight both the potential and the areas for refinement in unsmoothing 3D meshes, paving the way for future work in this area.

P44 Gene Duplication of the *Mimulus* Telomerase Complex

Student Researcher: Audrey Combs`26
Major: Molecular Biology
Research Collaborators: Surbhi Kumawat, Joyce Cortez
Faculty Collaborator: Jae Young Choi, Department of Ecology and Evolutionary Biology, University of Kansas

Several species of *Mimulus* (Monkeyflower) exhibit unique gene duplications in the telomerase complex, specifically in the telomerase RNA (TR) and the telomerase reverse transcriptase (TERT). Given the essential and evolutionarily conserved role of telomeres and telomerase, this study focuses on the presence and phenotypic effects of these variations within *Mimulus* genomes. A TERT gene duplication was initially discovered in Iron Mountain variants of *Mimulus guttatus*. Comparative genomic analysis of phylogenetically similar species revealed additional potential TERT duplicates at different stages of degradation in *M. guttatus var. AHQT1*, *M. nasutus*, and *M. tilingii*. RNA extraction and qPCR of the genes present in the meristem of Iron Mountain *M. guttatus* was planned to determine if the duplicate TERT sequence displays similar patterns of expression as the original TERT. Alternatively, the TERT sequence is possibly degrading, like the other species examined, due to redundancy. Furthermore, a duplicate TR gene was previously identified in *Mimulus lewisii*. To investigate the phenotypic consequences, a heterozygous F1 generation was created by crossing *M. lewisii* with *M. verbenaceus*, a closely related species without the TR duplicate. The F1 hybrids were backcrossed with *M. verbenaceus*, producing a range of offspring with and without TR duplicates. Growth measurements of these backcrossed plants were tracked to determine the association between gene duplication and phenotypic effects. Overall, we sought to examine presence and impacts of telomerase gene because of the unique variation seen in the evolutionary history of *Mimulus* species.

P45 An animal model of gender-affirming hormone therapy: the effects of testosterone or estrogen on sexual behavior in Long-Evans rats

Student Researcher: Kole Petersen `27
Major: Psychology
Research Collaborator: Fay A. Guarraci, Southwestern University

Not much is known about how gender-affirming hormone therapy (GAHT) impacts reproductive health and sexual motivation, especially in adult humans. Current literature does not properly simulate GAHT prescribed to adult humans, thus our 4-week study was designed to test an animal model of gender-affirming hormone therapy (GAHT) on the factors above. We investigated how female rats treated with testosterone enanthate (TE) and male rats treated with estradiol benzoate (EB) impacted their physiology and their behaviors when interacting with sexually receptive stimulus rats in a partner preference test. We found TE-treated female rats failed to become sexually receptive during a 10-day observation period, spent less time with either stimulus animal than controls across both phases of the partner preference test, and displayed more rejection behaviors when physical contact was possible. Ovarian weights did not differ, but TE-treated rats weighed more than controls by the end of the exposure period. In contrast, EB-treated male rats did not differ from controls during the partner preference test, yet testes and body weights were significantly lower than controls. Ultimately, these findings expand our understanding of the effects of GAHT on reproductive health and sexual behavior using an animal model.

P46 An Investigation on the Pervasiveness of Light Pollution in Urban Areas within the Rocky Mountain West Region

Student Researcher: Alison Mueller-Hickler`26
Major: Environmental Science
Faculty Collaborator: Cyndy Hines, State of the Rockies Project

Recent studies indicate light pollution can create adverse medical and ecological effects when combined with growth within urban environments. Growth is delineated as the change in land use composition and increases in city boundaries over time, meaning that development is an indicator of growth. The purpose of this research is to create an understanding of how growth, defined in terms of population growth and urban growth, changes the amount of light pollution present. Three of the fastest growing cities in the Rocky Mountain West, Albuquerque, New Mexico, Phoenix, Arizona, and Colorado Springs, Colorado, were examined at multiple levels of assessment including a GIS analysis of NASA Visible Infrared Imaging Radiometer Suite (VIIRS) and collected field data at various points within the greater metropolitan area of the three cities. The on-the-ground collected data indicated that creating an analysis of light pollution solely based on VIIRS data is not a comprehensive indicator of the lightscape of an urban environment. Therefore, a combination of collected data with VIIRS data would create a more complete picture of the lightscape. A comparison between 2012 and 2023 VIIRS data, a land use change analysis between the 1960s and 2023, sound decibel readings, crime and census data, and local and expert interviews indicate that growth within an urban environment does increase the amount of light pollution present in a visible and personal way affecting the lives of individuals. However, there is a glaring lack in policy initiatives and action within local governments besides those of nonprofit groups like Dark Sky International (DSI). These results support the hypothesis that urban growth and development lead to increased light pollution. Our research identified Albuquerque as the darkest city and Phoenix as the most light-polluted city. Between 2012 and 2023, Colorado Springs has had the most growth, considering land use change over time, as well as seeing the largest increase in brightest ranges of light pixels and is where the brightest ‘on-the-ground’ measurement was recorded. Commercial industries are identified as the largest contributors to light pollution and residential areas typically have lower levels of light pollution. Finally, interviews express that light pollution is an extremely pressing issue and is closely affiliated with development and urban growth/expansion. It is also clear that it is a relatively easy issue to solve as long as there is a willingness to do so.

P47 Diagnosing Pacific Walker Circulation Changes in Response to a Weakened AMOC

Student Researcher: Grace Casson `25
Major: Environmental Science
Research Collaborator: Chijun Sun
Faculty Collaborator: Allison Lawman, Environmental Studies Program

The Atlantic Meridional Overturning Circulation (AMOC) accounts for over 70% of global net cross-equatorial oceanic heat transport. Changes in the AMOC strength could exert large influences on global climate. There is high inter-model agreement that the AMOC may weaken or even collapse with future climate change but the climate responses across the tropical Pacific remain uncertain. Past time intervals during the last deglaciation provide an opportunity to explore the connections between AMOC strength and tropical Pacific climate. Here we investigate the response of the Pacific Walker Circulation (PWC) to reduced AMOC using 4 freshwater hosing simulations from version 1 of the Community Earth System Model. The simulations use constant freshwater fluxes of two levels applied in the North Atlantic and cover several time intervals throughout the deglaciation. We present changes in vertical velocity and sea level pressure to reconstruct annual and seasonal mean changes in the strength of the PWC. We find that warming in the eastern tropical Pacific accompanies negative vertical velocity anomalies, whereas cooling across the western Pacific coincides with positive vertical velocity anomalies. Together these changes suggest an overall annual mean weakening of the PWC under 12 and 15 ka background states and strengthening under 21 ka background state. The weaker PWC yields asymmetric rainfall changes across the tropical Pacific, with drier conditions in the western Pacific and wetter conditions in the eastern Pacific.

P48 Preserving the Starry Skies: Light Pollution's Impact on Cultural Heritage and Ecological Balance in Bears Ears National Monument

Student Researcher: Mustafa Sameen `25
Majors: Computer Science, Mathematics
Faculty Collaborator: Cyndy Hines, State of the Rockies Project

The Bears Ears National Monument is a land of exceptional cultural, historical, and ecological significance in southeastern Utah. The region is cherished by Indigenous tribes for its ancestral ties and unique natural ecosystems. However, the encroachment of artificial light pollution threatens these values by disrupting traditional ceremonies that depend on celestial markers, altering nocturnal wildlife behaviors, and impacting human health. This study draws on interviews with Bureau of Land Management (BLM) officials and Indigenous community members, survey findings, and existing literature to assess the multifaceted impacts of light pollution. Key insights include the role of Traditional Indigenous Knowledge (TIK) in shaping effective land management practices and the necessity of preserving dark skies to sustain both cultural and ecological continuity. Further analysis of global studies underscores how light pollution undermines cultural practices, disrupts ecosystems, and worsens disparities in environmental justice. By integrating technical solutions, such as shielded lighting and amber-hued LEDs, with community-driven initiatives, the Bears Ears co-management framework provides a model for balancing modernization with preserving cultural heritage and ecological integrity. This research reaffirms that maintaining the starry darkness of Bears Ears is not just a conservation goal but a moral imperative vital for safeguarding its spiritual and ecological significance for future generations.

P49 Studying indoor air quality (CO2) in college dorm rooms with short data model

Student Researcher: Cathy Xiao `25
Major: Chemistry
Research Collaborator: Gabe Katz `25
Faculty Collaborator: Sally Meyer, Chemistry and Biochemistry

Indoor air quality (IAQ), particularly CO2 concentration, is a concern in university residences where students spend approximately 90% of their time indoors. Elevated CO2 levels in these crowded settings can significantly impact well-being and academic performance. This research examines CO2 concentration dynamics within college dormitories, aiming to inform strategies that enhance indoor environmental quality. Using a predictive model based on short data sets, we analyzed the maximum CO2 concentrations, considering factors such as occupancy rate and building characteristics. This model facilitates further exploration of CO2 dynamics without necessitating prolonged student participation. Through detailed monitoring with low-cost handheld portable sensors, CO2 levels were collected across different rooms at Colorado College. Our findings reveal substantial variability in IAQ and underscore the importance of effective ventilation strategies to maintain acceptable CO2 levels. The comprehensive results will be discussed, providing information on improving student environments.

P50 The re-establishment of a ponderosa pine forest: a multi-scale retrospect of the second burn day of the Waldo Canyon Fire, CO

Student Researcher: Ben Curry ’25; Tyler Mielke `26; Rafiul Khan ‘26, Rachel Phillips ‘25
Majors: Environmental Studies; Organismal Biology and Ecology; Mathematical Economics; Political Science
Staff Collaborators: Cyndy Hines, State of the Rockies Project; Matt Cooney; Alyssa Tews, GIS

The increase in severity and frequency of forest fires has been linked to Anthropogenic climate change. The Rocky Mountain West is particularly susceptible with trends of rising temperatures and extended periods of drought. The Ponderosa Pine, a species reliant on low-intensity regulatory fires, dominates the Pike-San Isabel National Forests. Anthropogenic climate warming coupled with fire suppression tactics has inadvertently increased fire severity and catastrophic fire events within Ponderosa Pine forests. Catastrophic fire events have been demonstrated to significantly impact Ponderosa Pine regeneration in areas where no surviving trees remain. This summer, we conducted a demographic study over the burn area of the second day of the 2012 Waldo Canyon fire. In this study, we foster understanding of post fire ecology in Waldo Canyon through analysis of Ponderosa Pine seedling regeneration and environmental factors in North and South aspect sites.

P51 Quantifying Extreme El Niño Frequency from the Last Glacial Maximum to the Present

Student Researcher: Ethan Levin `25
Major: Environmental Science
Research Collaborator: Robert Domeyko, Judson Partin, The University of Texas at Austin Institute for Geophysics
Faculty Collaborator: Allison E Lawman, Environmental Studies Program

Extreme El Niño events, such as the 1997-98 and 2015-16 events have widespread impacts on global climate. Variations in the frequency of extreme El Niño events will have profound socio-economic implications, yet the response of the El Niño-Southern Oscillation (ENSO) to anthropogenic climate forcings remains uncertain. Past time intervals provide an opportunity to explore the response of ENSO to various climate forcings experienced throughout geologic history. Here we investigate the frequency of extreme El Niño events from the Last Glacial Maximum 21,000 years ago (ka) to the future using multi-century time slice simulations performed with the Community Earth System Model version 1.2 (CESM1.2). We quantify the frequency of extreme El Niño events in response to different climate forcings including sea level, insolation, greenhouse gasses, and deep ocean circulation. We define a threshold for extreme El Niño events based on the 95th percentile of November-December-January sea surface temperature anomalies (SSTA) averaged across the Niño 3.4 region for 0 ka. We find that the number of extreme El Niño events decreases from the Last Glacial Maximum to 15 ka, and then increases from 15 ka to 0 ka. To investigate the response to changes in ocean circulation, we also analyze freshwater hosing simulations for 12 and 15 ka. These simulations were designed to mimic the Heinrich Stadial 1 and the Younger Dryas events when the Atlantic Meridional Overturning Circulation abruptly slowed. We identify a larger number of extreme El Niño events in the simulations with reduced AMOC, but the results appear sensitive to the magnitude of the forcing. Together these results provide a long-term perspective on changing ENSO behavior that allows us to further contextualize proxy inferred estimates of paleo-ENSO variability.

P52 Neofascism & Religion in Italy

Student Researcher: Madison Sutter `25
Major: Political Science
Faculty Collaborator: Amanda Minervini, Italian Studies

During the last spring semester, I conducted a research study in Salerno, Italy as a part of CC's Intermediate Italian curriculum. Using the linguistic skills I developed; I was able to interview local Italians about a topic of my choosing. I chose to explore the political and contractual relationship between Pope Pius XII and Mussolini during WWII. The aftermath of this unprecedented collaboration revolutionized constituents' understandings of politics, religion, and the two in tandem in Italy. Because of the mere physical proximity of the Vatican City to Italy, there is a rich history of Catholicism's cultural, social, and political influence on Italy. During WWII, the partnership of Mussolini and Pope Pius XII allowed for the highly structured moral guardrails and demands of the Catholic religion to become deeply entrenched in Italian culture, politics, and legislation. After gathering qualitative data about sentiments towards Catholicism, fascism, and the intertwining of the two from local Italians, I was provided the knowledge base to transition into a more contemporary study of Italian politics. This summer, I worked with Dr. Amanda Minervini to explore what factors have allowed for a resurgence of fascism (i.e. "neo-fascism") in Italy, and the role religion has played in facilitating this resurgence.

P53 Characterizing the soil microbiome of invasive halophytes in disturbed and non-disturbed sites

Student Researcher: Riley Kadis `25
Major: Organismal Biology and Ecology
Research Collaborators: Luke Stanley, Natalie Van Tol
Faculty Collaborator: Jesús F. Peña, Organismal Biology and Ecology

Tamarix sp. of the *Tamaricaceae* are an invasive tree common in riparian areas across the South West United States which can outcompete native *Salicaceae* trees. *Tamarix sp*. are drought-adapted halophytes with the capacity to concentrate salt in their foliar tissue. At the end of a growing season, the senesced leaves contribute to increased salinity in the topsoil giving this organism an advantage over native plants. In order to examine the effect of *Tamarix sp.* on the soil microbiota we collected soil along a gradient of distance from *Tamarix sp.* trunks in areas with different disturbance history and shade aspects. Soil samples were tested for macronutrient content and salinity. Serial dilutions of the soil were used to observe culturable microbes. While fungi appeared consistent along the gradient, we found differences in bacterial community composition. Additionally we have employed ITS/16S metabarcoding to characterize the full microbial communities associated with each site.

P54 Theoretical Modeling of the Impacts of Metapopulation Dynamics on Disease Spread

Student Researcher: Éowyn Mairon Poplawski `26
Major: Biostatistics (IDM)
Faculty Collaborator: David Brown, Mathematics and Computer Science

Beginning with the pioneering work of Kermack and McKendrick in the early 1900s and continuing through the ongoing COVID-19 pandemic, epidemiologists have used mathematical models to understand and predict the spread of infectious diseases. Classic models assume a single, homogeneous, well-mixed population of susceptible individuals, with recent work investigating the effect of social network structures on the spread of diseases (Keeling 2005). Our research takes an intermediate approach to disease modeling: we examine the impact of a metapopulation model on a classic SIR model. Such an approach remains underexplored in the realm of epidemic modeling, despite being a highly relevant area in population ecology. With the rising relevance of disease models, a metapopulation model could have valuable insights for future epidemic response protocols, since individuals tend to live in a network of small communities. It may also help us understand pre-historical patterns of infectious diseases when humans lived in small groups. While our research is ongoing, our model trials so far suggest that this approach yields a different result than a classic approach. Our model uses functions in R Studio to combine small community networks linked with occasional contact and a traditional SIR model.

P55 Spatial and Temporal Variability of Shallow Lake Ecosystems

Student Researcher: Lucy Hylton ‘25
Major: Environmental Science
Research Collaborators: Emily Marple, Olivia Spencer
Faculty Collaborator: Miro Kummel, Environmental Studies Program

Spatial and temporal heterogeneity in shallow lakes supports diverse habitats and ecological interactions. This study explores heterogeneity in macrophyte cover, chlorophyll-a, and cyanobacteria in Rybník Rod, a Czech fishpond influenced by nutrient-poor peat bog water and nutrient-rich inlet water. Sampling occurred across three lake regions—bog bay, inlet bay, and main lake—from late June to late July.
Results indicate significant spatial and temporal variation. Early in the study, the bog bay exhibited high macrophyte cover and low chlorophyll-a and cyanobacteria levels, characteristic of a macrophytic, or clear-water, state. In contrast, the inlet bay maintained a turbid state with elevated nutrient loads. By mid-July, macrophytes collapsed in the bog bay, influenced by heavy precipitation and subsequent inflow of acidic water from the bog.Chlorophyll-a and cyanobacteria levels increased throughout the fishpond as macrophyte cover declined, reflecting state transitions. Dissolved oxygen, pH, specific conductivity, and temperature varied spatially and temporally, correlating with shifts in lake states. The findings of this study provide insights into alternative stable states and their management in shallow lake ecosystems.

P56 Non-Thermal Plasma’s Inhibition of *Escherichia Coli* Growth on Stainless Steel Compared to Store-Bought Dish Soap

Student Researchers: Lillian Arangio ‘27; John Bragg ‘28
Majors: Neuroscience; Organismal Biology and Ecology
Faculty Collaborator: Adam Light, Physics

Escherichia coli is a gram-negative bacteria known to cause gastrointestinal illness, particularly as a food-borne pathogen. Atmospheric pressure non-thermal plasma has been shown to have anti-bacterial effects, which can be attributed to its introduction of highly reactive species such as ozone and its ability to disrupt cellular membranes. More specifically, plasma jet treatment has been shown to have a lethal effect on *E. coli*; however, a comparative analysis regarding its efficacy against a conventional dish soap and water solution remains unexamined. In this experiment, we use ionized argon and a Dawn dish soap solution to treat separate samples of *E. coli* K1 HB101 on stainless steel. We compare the resulting bacterial growth of the samples to assess the comparative effectiveness of the two treatments in inhibiting bacterial proliferation. We find that ionized argon treatment via a plasma jet inhibits the growth of *E. coli* bacteria and demonstrates greater efficacy compared to a Dawn dish soap and water solution. Although practical limitations exist that hinder the application of plasma jets for food safety, our results suggest that, if made practical, atmospheric pressure non-thermal plasma treatment can prevent the spread of *E. coli* as a food-borne pathogen.

Modeling Stock Return Distributions

Student Researcher: Alexander Ward `24
Major: Mathematical Economics
Research Collaborators: Bayliss Baker, Mahnoor Rehman
Faculty Collaborator: Flavia Sancier-Barbosa, Mathematics and Computer Science

At the beginning of this project, my group identified two primary research questions: (1) what distributions are best at modeling the probability distributions of stock returns? And (2), are stock return distributions independent? Previous studies on these subjects have had varying and inconclusive results. We pulled monthly, weekly, and daily data from roughly 15 sectors, 6 private companies, and 8 index funds from Yahoo Finance to understand sectoral distribution differences. Using RStudio, we ran KS and CVM texts, among other things, to see how closely theoretical probability distributions followed actual financial data. With all our findings in a spreadsheet, we found the mean KS and CVM values and ranks for each distribution. These results supported our initial hypothesis, showing that the distribution with the most parameters -- the Generalized Hyperbolic Distribution – best models stock return distributions. Our findings also showed the superiority of the Laplace distribution over the Normal, and the surprising accuracy of the NIG and T distributions. These findings suggest that investors should rethink their biases toward the Normal distribution and attempt to find workarounds that allow them to model using a more accurate base distribution.

Fostering Civic Engagement in Pursuit of Equitable Municipal Budgeting; Problems With Policing: Analyzing the Fiscal, Public Health, and Racial Burdens of Policing and Imagining New Solutions

Student Researcher: Timothy Smith `25
Major: Sociology
Faculty Program: Sociology, Social Action Institute

Working alongside San Marcos City Government representatives, our research sought to lay the groundwork for a budget equity movement in San Marcos, Texas. My research explicitly linked fiscal decisions to decreased quality of life in San Marcos and engaged equitable budgeting praxis by analyzing historical and geographic instances of equitable budgeting praxis. In building an equitable budgeting movement, we identified strategies for boosting civic engagement, engaging policy makers, and implementing equitable praxis. Similarly, a secondary project analyzed the City of San Marcos' bloated police budgets, noting discrepancies in budgeting and spending, and analyzed the relationship between increased police funding and decreased social service funding. Analyzing case studies across the country, my research made several policy recommendations to reduce the fiscal burden of policing including, but not limited to, banning low-level traffic stops and non-policing crisis response teams.

Analysis of opinions on the oil and Gas Industry through the Annual Conservation in the West Survey

Student Researcher: Zara Zafar `27
Majors: Mathematical Economics and Political Science
Faculty Collaborator: Kat-Miller Stevens, State of the Rockies Project

Building upon Rangaraj ('23), Sameen ('25), Roueche ('23), and Zafar ('24)'s analysis of the Conservation in the West Survey, my research expanded and refined their investigation of public opinions on environmental conservation versus energy development in the American West. The study examines polling data from 2018-2023, analyzing how demographic characteristics influence attitudes toward environmental protection and domestic energy production across eight Rocky Mountain states. Using logistic regression analysis, the research revealed significant relationships between demographic factors and environmental preferences - female respondents were 1.55 times more likely than male respondents to prioritize environmental protection over energy development, while non-white respondents were 1.12 times more likely than white respondents to favor environmental concerns. Geographic variations emerged, with respondents from states without active fracking operations showing stronger support for environmental protection compared to those from states with fracking activities. Additionally, temporal analysis demonstrates how public opinion shifted during periods of energy price volatility, particularly in 2022. As part of this research, I developed a comprehensive codebook for the Public Lands Project, systematically transforming qualitative interview responses into quantifiable data through standardized coding protocols. This methodological contribution enabled rigorous analysis of previously unstructured survey data, enhancing our understanding of public attitudes toward land conservation in the Rocky Mountain region.

Light Pollution And Infant Health: Skyglow's Impact on Birth Weight, Gestation, and NICU Admissions

Student Researcher: Ella Reese-Clauson `26
Major: International Political Economy
Research Collaborator: Andres Azqueta
Faculty Collaborator: Guanyi Yang, Economics and Business

Globally, more lights are staying on later, increasing artificial light at night (ALAN) in an uptick that increases productivity and discourages crime but is also attributed to adverse health effects in humans and animals. Amidst a growing body of research linking light pollution to general adverse health effects, scholarship on the impacts of this radiance on fetal health is insufficient. Our research seeks to bridge this gap. Through a comprehensive analysis of data encompassing environmental light levels and infant health records, we aim to shed light on the potential correlations and implications for neonatal health. We use Dark Sky Satellite data in conjunction with the National Vital Statistics System (NVSS) dataset, which is the most complete data on births in the United States. Through a combination of linear regressions and machine learning techniques, we associate increased exposure to ALAN with a lower gestational length, decreased birth weight, and increased NICU admissions, a series of fetal health impacts that we correlate with various maternal health indicators stemming, too, from heightened ALAN exposure. These findings promise to advance our understanding of environmental factors influencing infant well-being and may contribute to the development of targeted interventions for healthier early childhood development.

Tiling the Collective- Socialist Remnants through Mosaics in Berlin and Potsdam

Student Researcher: Isabella Nevin ‘25
Major: Political Science

Berlin, in many ways, has served as a gateway between European political-economic paradigms. It’s streets directly walk the line between the socialist and the capitalist, the developed and the “underdeveloped”, the European internal and socialized “East,” and the normative assumption of the “West.” Though the wall has since fallen, traces of an East-West divide are both memorialized from this past, offering crucial glimpses into the cultural and political structures which governed the lives of everyday Berliners. This project seeks to examine works of art crafted before this incorporation into a capitalist West, in order to carve out a discourse of citizenship within a panorama of public space–mosaics created under the GDR. Mosaics themselves carry an array of connotations, particularly regarding antiquity and the constitution of religious or sacred space. The utilization of this historical medium for the creation and portrayal of something definitively modern and progressive, being a discourse of citizenship under the guidance of a modern nation-state, creates a particular tension which this project explores. Mosaics offer both a method of pictorial representation through the arranging of imagery, as well as a spatial element. Finally, the temporal element of the form of the mosaic and its imagery represents the goals of the GDR and the socialist ideal world it sought to portray– a utopia of past and present.

What are internships?

Internships provide high-impact experiences that allow students to demonstrate their ability to apply the knowledge and skills they are learning in the classroom to workplace settings. Through these applied learning experiences students enhance their existing skill set, expand their professional network, and discern future career goals. Colorado College students participate in a wide array of internships in various roles and industries.

Over 100 students received Summer Internship Funding Awards for Summer 2024, allowing them to participate in internship opportunities, many of which remain unpaid or underpaid. Students who receive funding participate in prep programs, reflection activities, and ongoing support to enrich their internship experience.

Students also participated in other Colorado College sponsored internship programs such as the Public Interest Fellowship Program, offering paid fellowships in Colorado's nonprofit sector, the Charlie Blumenstein Stewardship Internship in partnership with The Nature Conservancy-Colorado, National Public Radio, and Colorado Public Radio.

To learn more about these programs, and more, visit:
www.coloradocollege.edu/careercenter/

IR1 Pikes Peak Outdoor Recreation Alliance (PPORA), Colorado Springs, CO

Colorado College's Public Interest Fellowship Program

Student Intern: Manny Kahne '25
Major: Psychology

This past summer I was the Community Engagement Fellow for PPORA; a collaborative of government agencies, land managers, outdoor businesses, and outdoor recreation advocacy organizations whose mission is to strengthen the outdoor recreation industry in the Pikes Peak region. My primary responsibilities included social media content creation, newsletter updates, meeting with partner organizations, and general administrative duties. Over the course of the summer there were several special events that I helped plan and execute including *Get Outdoors Day*, *Outdoor Pikes Peak Initiative* (OPPI), and S*tate of the Outdoors*. Some unique projects I worked on throughout the summer were community spotlight interviews and an introduction video for the State of the Outdoors event. Unique opportunities from the summer were working closely with the U.S. Forest Service and Colorado Parks and Wildlife. I would like to thank my supervisor McKenzie Carmack and the PPORA Executive Director, Becky Leinweber, for being so supportive and allowing me to grow, both personally and professionally, throughout my fellowship this summer.

IR2 One Colorado, Denver, CO

Colorado College's Public Interest Fellowship Program

Student Intern: Stecy Mwachia '26
Major: Political Science

As the Development Fellow at One Colorado, the state's leading LGBTQ advocacy organization, I gained hands-on experience in nonprofit operations, fundraising, and community outreach. My responsibilities included collaborating with Zim Consulting to develop grant applications, tracking donations for the 2024 Prism Awards, and communicating with staff from other nonprofits and local businesses to secure support for organizational initiatives. During Denver Pride Weekend, I practiced soft skills by engaging with diverse attendees at tabling events, distributing resources, and mastering an impactful organizational pitch. I also led planning and outreach for the Silent Auction, supported registration and check-in processes at events, and contributed to the success of One Colorado's Pink Party, the largest dance party fundraiser of the weekend. Beyond events, I deepened my understanding of 501(c)(3) operations by working with the Board of Directors, exploring funding restrictions, and ensuring transparency in financial reporting. Conversations with mentors and collaboration across various teams provided valuable insights into advocacy work and leadership in nonprofit settings. This experience enhanced my grant writing, event management, and professional communication skills while strengthening my confidence in advancing equity for marginalized communities.

IR3 NPR's All Things Considered, Washington, DC

Student Intern: Linnea Anderson '26
Major: Political Science

I worked for All Things Considered from their headquarters in Washington, DC. All Things Considered is National Public Radio's (NPR) afternoon news program. It was the first program broadcasted on NPR in 1971. NPR is the syndicate for over a thousand public radio stations throughout the United States. All Things Considered is distributed to all of these stations daily. I was tasked with pitching stories at our morning meetings, booking and interviewing guests, writing and editing scripts, recording and producing the audio files, and managing communications with NPR reporters, editors, and hosts. Aside from producing daily radio segments, I reported my own story on the evolving tattoo industry. After a trip to Brooklyn, countless interviews over the phone, and editing and producing the story, my voice aired on my final day in the office. I am immensely grateful for this opportunity and adore all the individuals I worked with throughout the summer.

IR4 Citizens Project, Colorado Springs, CO

Student Intern: Evie Angevine '25
Major: International Political Economy

Since 1992, Citizens Project has worked to educate and empower the people of Colorado Springs and increase accessibility and knowledge about government. Citizens Project works to promote democracy and equity through community events and legislative monitoring. During my community engagement and civic responsibility internship, I was able to gain a better understanding of the ins and outs of a nonprofit. I assisted in grant writing and fundraising which taught me about the importance of volunteers and donors in promoting engagement. I also worked on programs and events including tabling at Pikes Peak Pride and Youth Pride to spread awareness about the work we do. Citizens Project produces a legislative report every summer to increase education on the bills throughout the year and how our representatives voted on them. I helped to research bills and synthesize government jargon into more accessible language. This experience taught me so much about the nonprofit sector and the importance of civic engagement.

IR5 Colorado's 4th Judicial District Attorney's Office: The Neighborhood Justice Center, Colorado Springs, CO

Student Intern: Kailani Aragon '25
Major: Psychology

Colorado's 4th Judicial District Attorney's Office works to protect and serve El Paso County through a variety of services ranging from Victim Advocacy to the Neighborhood Justice Center (NJC). I was fortunate enough to earn a position in NJC where I learned and participated in mediations and gained knowledge about court vocabulary and processes. NJC provides citizens a way to peacefully navigate minor disputes through mediation as an alternative to traditional court processes. During mediations, a trained mediator facilitates a meeting between all involved parties in the hope of developing mutually agreeable terms. Mediations allow the courts to focus on more serious crimes. NJC and the mediation process also provide an opportunity for defendants and victims to create unique solutions catered to their dispute that may not be available through the courts. NJC allows a safe space for victims to have an influence on the case's outcome and for defendants to take responsibility for their actions. In an already overburdened system, NJC opens the door for minor disputes to receive the attention they deserve.

IR6 4th Judicial District Attorney's Office (DAO), Colorado Springs, CO

Student Intern: Hunter Burge '25
Major: Political Science

I started volunteering as a Legal Assistant at the 4th Judicial District Attorney's Office in the spring of 2024. This past summer, I had the opportunity to pursue this experience on a larger scale in the Restitution Department. I mainly focused on the end of a case by processing Victim Impact Statements, running locates on victims, prepping cases, and ordering restitution in step with court proceedings and state law. This experience provided me with invaluable information regarding the criminal justice system and the numerous actors that affirm, interact with, and challenge prosecutorial agencies.

IR7 Food to Power, Colorado Springs, CO

Student Intern: Isabel Cody '25
Major: Political Science

Food to Power is a local nonprofit organization seeking to build an equitable food system through three main pillars of action: Food Production, Food Access, and Food Education. Food to Power promotes this mission through their values of collaboration, co-powerment, communities, equity, resilience, and innovation. During my internship, I had the opportunity to get involved with different departments within the organization. On the farm, we took care of a wide variety of plants; we seeded, transplanted, harvested, and ultimately distributed the produce to the community. Twice a week, we assisted the Food Access department with their No-Cost Grocery programs, sorting, organizing, and distributing food that we received from various grocery stores, community donations, and from our own farm. Once a week, we helped with Street Petz, packaging and giving out lunches to people experiencing houselessness at a park in Colorado Springs. Additionally, we worked with the advocacy department in canvassing the Hillside neighborhood to get the word out about Food to Power's work and programs. Through growing and distributing food, hosting educational events for students and community members, and advocating for policy change, Food to Power serves a vital role in intentionally building community while working to address food insecurity and wider inequalities in the food system.

IR8 Food to Power, Colorado Springs, CO

Student Intern: Tori Hodkin '25
Major: Sociology

Food to Power, an urban farm focused on creating an equitable food system in a systemically disenfranchised area, sits in the only historically redlined neighborhood within the Springs —a neighborhood whose primary option for food is the 7-Eleven one mile away. By focusing on food sovereignty, through growing and redistributing grocery stores' surplus of food, Food to Power seeks to mitigate some of the systemic inequity in the Hillside neighborhood. My internship was incredibly versatile, allowing me to participate in every aspect of the organization. My week consisted of harvesting, planting, preparing, and delivering produce to local restaurants. Being on the farm allowed me to expand my limited knowledge of plant biology and be resourceful in the creation and adaptation of growing routines in the face of climate change. In conjunction with our no cost grocery program, I oversaw Community Corner, a community-driven cooking project that allows people to sample a plant-based dish while waiting for groceries. All these experiences helped me holistically understand food sovereignty and the need to advocate for food justice on local and federal levels. This hands-on experience has exposed me to "changemaking" and will guide me through what I value in a nonprofit workplace.

IR9 The Family Tree, Wheatridge, CO

Student Intern: Charlotte Combe ‘26
Majors: Sociology and Feminist & Gender Studies

During the summer, I completed an internship in the Homelessness Services Department at The Family Tree. The Family Tree is a nonprofit that seeks to end the interconnected issues of child abuse, domestic violence, and homelessness. In my role, I connected callers with rent and utility assistance programs and other resources in the Denver metro area. I routinely managed the front desk of our offices, welcoming clients and guiding them through our food pantry and various assistance programs. I also ran our helpline, where I answered the phone and connected clients with their case managers. I processed over 60 utility assistance applications, which involved faxing, screening, copying various documents, and compiling them in an online database. One of my favorite parts of this role was re-designing the resource packets given to clients regularly. I utilized Canva and maintained the brand standards of The Family Tree, increasing the visual accessibility of the resource packets.

IR10 Cheyenne Mountain Zoo, Colorado Springs, CO

Student Intern: Raegan Cushman ‘25
Major: Organismal Biology and Ecology

The Cheyenne Mountain Zoo (CMZ) is rated highly among the best zoos in the nation. Their mission is to be a leader in conservation, captive breeding, and animal care while educating the public in such a way that inspires action. I shadowed the keepers in Primate World taking on almost all the tasks of a zookeeper to fully learn about animal husbandry. I worked primarily with Bornean and Sumatran Orangutans, Western Lowland Gorillas, White-cheeked Gibbons, Naked Mole Rats, and Emperor Tamarins. Every day, I participated in diet prep, enrichment, training, cleaning, and interacting with the public. Some of the most rewarding aspects were the relationships I established with many of the animals getting to know their unique personalities. This experience shifted my understanding of zoos and gave me valuable connections in the animal husbandry field.

IR11 Pittsburgh Zoo and Aquarium, Pittsburgh, PA

Student Intern: Maggie Davis ‘27
Major: Mathematics

This past summer, I had the opportunity to work as the Registrar Intern at the Pittsburgh Zoo and Aquarium. I helped maintain over 100,000 animal records dating back to 1941. Using the database ZIMS (Zoological Information Management System), I updated current notes and observations about the animals and helped train zookeepers on how to use the database to their advantage. I also learned about animal permits, transactions, and transportation documents. I loved working as the Registrar Intern as it helped me gain insight into the documents and paperwork it takes to run a zoo. I gained insight into zoo management and was able to spend the summer at my favorite place in Pittsburgh. Towards the end of my experience, I was able to transfer information from old zookeeper notebooks from 1981 to ZIMS, expanding our knowledge of the lives of the zoo’s past animals and completing their story. Overall, I am so happy that I was able to complete this experience as it truly was the highlight of my summer.

IR12 GROW Internship with Western Organization for People Living with AIDS/HIV (WOPLAH), Mumias Town, Kakamega County, Kenya

Student Interns: Riley Diehl ‘26, Psychology; Skye McCrimmon ‘25, Biochemistry; Elise Evans ‘26, Neuroscience

WOPLAH provides holistic support for those living positively, caregivers, and families affected by HIV/AIDS across Kakamega County in western Kenya. WOPLAH has implemented 14 different projects from agriculture initiatives, to education, to physical and emotional health programs, with over 2,000 people having access to these programs. As interns, we served as support for WOPLAHs various projects and initiatives, applied for grants, and worked on marketing for the organization. Working with WOPLAH this summer was truly a once-in-a-lifetime opportunity, while the bulk of the work as an intern was online, the most important part of this summer was the immersion into the community and culture of rural western Kenya. We lived with a host family, shared meals and stories with incredible people both working to support WOPLAH and who are supported by WOPLAH and built a true “family” in Kenya.

IR13 The Clean Coalition, Santa Barbara, CA

Student Intern: Zach Dinklage ‘26
Major: Business Economics and Society

I worked with the Clean Coalition, a nonprofit focused on accelerating the transition to renewable energy and a modern grid. My work centered on two main projects: 1) Conducting a Solar Microgrid Feasibility Study for Colorado College, and 2) Contributing to the “Decarbonize LA” initiative. In the Solar Microgrid Feasibility Study, I analyzed 15-minute interval electricity load data and designed a solar system that considers future increases in electricity demand, such as the addition of Electric Vehicle (EV) chargers. Using Helioscope software, I modeled solar arrays on rooftops and parking structures, accounting for shading from trees and buildings. I seized a battery to meet critical loads and enable the system to disconnect (island) from the grid when necessary. The design was then evaluated using Energy Toolbase (ETB), an economic tool for solar development projects. For the “Decarbonize LA” initiative, the goal was to identify gaps in the Los Angeles Department of Water and Power’s (LADWP) plans to achieve net-zero emissions by 2035 and to propose policy changes that would help LADWP meet these targets.

IR14 ACCESS Center, Self-Help Legal Aid Service of the San Francisco Superior Court, San Francisco, CA

Student Intern: Carolyn Dormady ‘26
Major: International Political Economy

I worked with the ACCESS (Assisting Court Customers with Education and Self-Help Services) Center at the San Francisco Superior Court. ACCESS to Justice is a public-service committed organization with self-help legal aid centers in the Bay Area. The Center provides help to self-represented litigants in filing for dissolution of marriage, restraining orders, small claims, name and gender changes, child custody or support orders, establishing parentage, and eviction cases. The ACCESS Center is a free, neutral service that provides legal information to customers to empower them as they navigate the legal system. Since I was dealing with litigants who were currently in abusive environments seeking immediate relief and resolution, I often had to find the right balance of being efficient and making them feel heard. As an undergrad pre-law student, it is rare to find an experience that is so hands-on.

IR15 CC Mobile Arts, Colorado Springs, CO

Student Intern: Camila Espinosa ‘25
Major: Independently Designed Major in Indigenous Psychology

During my summer internship with CC Mobile Arts, I rooted myself in the social and cultural ecosystem of Colorado Springs by taking the lead on Mobile Arts events, taking the lead on various internal and collaborative projects, and regularly investing my time in the community through my engagement with community partners and local events. I took the lead on events such as recurring art workshops for adults with disabilities, recurring summer camp workshops, and the collaboration with a local nonprofit providing free food shares. I cultivated relational skills through the experience of creating and maintaining relationships with community partners. I gained a wide diversity of skills such as learning how to apply for city permits, designing a brochure, applying for grants, and becoming an expert truck driver and truck-driving instructor. I was able to gain experience in areas that ranged from practical and on-the-ground to theoretical and macrocosmic, particularly the engagement in larger conversations about the role of community art in enacting social change. By the end of the summer, I really understood and felt embedded in the cultural landscape of Colorado Springs through my work with Mobile Arts and feel energized and inspired to continue investing in creative strategies for social change.

IR16 Northern Arizona University, Physical Therapy Department, Flagstaff, AZ

Student Intern: Tatum Holm ‘25
Major: Neuroscience Minor: Human Biology & Kinesiology

The Northern Arizona Physical Therapy Clinic is dedicated to providing exceptional rehabilitative care to individuals of the community and fosters hands-on learning experiences for upcoming and current physical therapy students. Their mission revolves around promoting health, wellness, and recovery through personalized treatment plans. Throughout this internship, I assisted in developing treatment plans specific to individual injuries in order to help alleviate pain and improve overall quality of life. The physical therapists that I worked with helped explain each plan relating to both short-term and long-term relief for patients. I observed evaluations and assisted with patients’ treatment. I also aided in creating patient profiles for recording assessments and treatments. Being able to gain this hands-on experience allowed me to pursue my interest in a physical therapy career, develop clinical skills, and make meaningful contributions to the well-being of patients.

IR17 Harvard Medical School Orthopedic Trauma Initiative at Brigham and Women’s Hospital, Boston, MA

Student Intern: Annabelle Swenson ‘25
Major: Molecular Biology

As a Clinical Research Intern, I collaborated with the research team and contributed to multiple projects in various stages of completion. I compiled literature reviews on topics like postoperative opioid administration, return-to-work protocols for pilots following orthopedic injury. I administered a survey to geriatric patients and prepared various studies for institutional review board (IRB) submission to ensure quality clinical research practices. I also participated in a weekly intern journal club and compiled various case study presentations in collaboration with an attending physician. I was also paired with an attending physician for shadowing opportunities in both an outpatient clinic and operating room, and observed many orthopedic trauma surgeries and gained familiarity with both environments and proceedings.

IR18 Centre for Applied Nonviolent Actions and Strategies (CANVAS), Belgrade, Serbia

Student Intern: Emma Faraon ‘25
Major: Political Science

During my summer internship at CANVAS in Belgrade, Serbia, as an Analytical Research Intern, I gained valuable insights into nonviolent activism and human rights. I participated in several Zoom calls discussing activist plans in countries like Georgia, the Tibet region, and Venezuela, and the energetic office atmosphere was inspiring. I also contributed to daily conflict and activism updates for the website and conducted an extensive case study on Tibetan rights in China and Bolivia. This experience significantly improved my research and writing skills, particularly in locating unique sources on social media. Living in Belgrade for three weeks was an incredible cultural experience, immersing me in a post-Yugoslav nation and introducing me to the nonprofit world. This internship was academically and ethically enriching, helping me clarify my career path and gain hands-on experience in a foreign city.

IR19 Research Assistant to Artist in Residence Janani Balasubramanian at Stanford Electrical Engineering and Physics Departments, Stanford, CA

Student Intern: Nyah Flores ‘25
Major: Neuroscience

Janani Balasubramanian is an artist who collaborates with scientists to create immersive works that allow participants to form a human connection with science. This summer as Janani’s research assistant I coordinated and took notes for multiple online and in person meetings with scientists, producers, animators, surgeons, chaplains and more. I transcribed and extracted useful quotes from interviews with artist-scientist teams that will be used in a book that Janani and Astrophysicist Dr. Gosnell are working on. I coded English and Spanish reaction cards collected from the exhibit of “The Gift”. These transcriptions are initial data points for a study with Stanford Medical School that seeks to find the efficacy of this artwork as a therapeutic modality for those dealing with loss. Along with developing practical skills this experience challenged my ideas of art and science and the importance of interdisciplinary collaboration in knowledge seeking and expressing.

IR20 Woods Hole Oceanographic Institute, Woods Hole, MA

Student Intern: Jace Fuller ‘25
Major: Organismal Biology and Ecology

Common bottlenose dolphins depend on vocalizations for a variety of functions, including prey detection/hunting, predator avoidance, and communication with conspecifics. Anthropogenic noise disturbance especially in high-traffic environments cause auditory masking and induce avoidance behavior, limiting the animals’ ability to communicate. The goal of the present study was to quantify whistling and foraging behaviors of bottlenose dolphins at different stages of vessel approaches and in the absence of vessels in order to observe the behavioral response of vessel approaches. During brief catch-and-release sessions, focal animals were equipped with digital acoustic tags (Dtags) that recorded up to 24 hours of an individual and their conspecific’s movement and behavior. Nine focal tags and tags of conspecifics were audited for vessel approaches by Austin Allen (2021) and whistling and buzzing behavior by the author and other students and experts. There were insignificant differences in all rates during onset, after, and control periods, except for buzz duration rates. Every individual had a non-significant change in whistle, signature whistle, and buzz rates. These results suggest that vessel traffic doesn’t affect how often dolphins whistle, which is consistent with some recent literature; however, a larger sample size is needed to draw firmer conclusions. On the individual level, different albeit insignificant trends existed, demonstrating the need for models that incorporate individuality rather than counting overall dolphin responses. While the current study lacks definitive conclusions, it may provide a steppingstone for future avenues of research on dolphins and their responses to vessel traffic.

IR21 Colin Allred for U.S. Senate, Dallas, TX

Student Intern: Koray Gates ‘25
Major: Political Science

This past summer, I had the opportunity to work as a Digital Intern on the Colin Allred for U.S. Senate campaign. Colin Allred is a progressive candidate dedicated to expanding access to healthcare, protecting voting rights, and advocating for economic and social justice across Texas. As part of the digital team, I contributed to the campaign’s online strategy by creating social media graphics and videos, planning social media influencer events, tracking engagement, and assisting with digital advertising. I also had the chance to work with other departments to coordinate event planning and travel for Congressman Allred and the staffers who would be with him. I gained valuable insights into the operations of a political campaign and the importance of digital media and grassroots organizing. This experience has been incredibly informative for me and has shaped my ideas about what I want to do post-graduation.

IR22 Embassy of the Republic of Paraguay in the Republic of China-Taiwan, Shipai, Taipei, Taiwan

Student Intern: Veronica Gonzalez Paris ‘26
Major: Business, Economics, and Society, **Minor:** Chinese Language

Paraguay is the only country in South America to recognize the sovereignty of the Republic of China-Taiwan, so we hold dearly our loyal ties with Taiwan by supporting their democracy. My main job was to shadow the Ambassador and assist with duties like document translation, statistical reports and graphs, and compiling notes into archives. I closely worked with the Commercial Attaché whose main task is to strengthen our bilateral, economic development and relations with Taiwan. This hands-on experience taught me a lot about International Relations and Economic Development through the relations between my country and Taiwan. It allowed me to further my public speaking, English and Spanish formal writing, and quantitative skills. I would highly recommend this or a similar experience to anyone interested in the International Relations field.

IR23 Concrete Couch, Colorado Springs, CO

Student Intern: Jake Greenblatt ‘25
Major: Psychology

Concrete Couch is a local nonprofit that builds community through creative experiential learning. Concrete Coyote is the public park that also functions as a home base for the organization. Concrete Couch has a wide reach in the Colorado Springs community. I had the opportunity to wear many hats. Part of my responsibilities involved creating a curriculum and leading free and reduced cost summer camps. I was involved with construction, art, cooking, and sculpting camps. I mentored high school interns as new educators through these summer camps and witnessed their growth as young, new educators. In addition to the camps, I worked on various community and Concrete Coyote projects. I gained hands-on experience with power tools, mosaics, and trail work. Concrete Couch is a relatively small organization, and I held a lot of organizational responsibility while also providing direct service. To be a core part of an organization that is actively making the world a more magical place was enlightening and energizing. I am so grateful for this opportunity to find my footing in a pocket of the world that gives me hope for the future. I plan to continue my work with Concrete Couch through my senior year and beyond.

IR24 Korn Ferry, Kyiv, Ukraine

Student Intern: Sonia Guliak ‘25
Major: Business, Economics & Society

Over the summer I interned at, Korn Ferry, a global organizational consulting firm in their Ukrainian office. The firm works with clients to design their organizational structures, roles, and responsibilities, helps them hire the right people and advises them on how to reward, develop, and motivate their workforce. Instead of routine power points and excel sheets I was immersed in the real-life scenarios featuring real clients. My first client was Ukraine’s leading department store, TSUM, looking for new hires as well as ways to improve the efficiency of internal operations. My second was Center for Economic Strategy (CES), looking for assistance in tasks related to Euro-integration, updates on federal policies, and analysis of effects of the war on Ukraine’s economy. This experience has shown me how versatile one job can be. The diversity of tasks I faced have sparked my enthusiasm and made great use of my liberal arts education. I gained analysis skills, built meaningful connections, learnt how to work with AI in an efficient way, but most of all – I tasted the real job. This summer was a huge step forward in my professional life.

IR25 Salita Suárez, Province of Buenos Aires, Argentina

Student Intern: Andrew Han ‘25
Major: Neuroscience

I spent the summer shadowing and interning at a primary healthcare center in Argentina. Salita Suárez is in the José León Suárez neighborhood of the municipality of San Martín, and part of a network of community organizations in Buenos Aires called Voluntario Global. The first month was largely spent rotating and shadowing the healthcare professionals in the center, including: general practice doctors, a dermatologist, a gynecologist, a pediatrician, dentists, psychologists, a social worker, a nutritionist, a pharmacist, nurses, and health promoters. The second month was largely spent working with the health promotion and disease prevention team creating informational posters or preparing material for community outreach events like the International Day of Childhood. This experience, both clinical treatment and administrative health promotion, has excited me for a career in preventive medicine.

IR26 United States Senate, Senator Michael Bennet, Denver, CO

Student Intern: Royce Hinojosa ‘26
Major: Economics and Philosophy

Congressional District Offices are a critical bridge between a Senator and their constituents. These offices execute many tasks but have two primary focuses. One of which is constituent case work (i.e., holding federal offices like USCIS, VA, Social Security, and the IRS accountable when they fail to deliver Coloradans the services they're promised). The other is to serve as a direct line of communication between constituents and their Senator. With active phones every weekday, callers are able to talk to real people and voice their thoughts on the current state of political affairs. On the frontlines of constituent communication, interns are able to firmly grasp an intensifying political atmosphere and understand deeply the importance of the office's role in elevating constituent voices. Independent of the current political moment, this internship provided ample opportunity to better understand the workings of the White House, U.S. Department of State, the Department of Health and Human Services, and more.

IR27 350Marin, Marin County, CA

Student Intern: Isabella Ingersoll ‘25
Major: Environmental Studies

I served as a Climate Specialist Intern at 350Marin, the Bay Area’s primary local chapter of the greater 350.org, a national grassroots environmental nonprofit. 350.org aims to advocate for environmental justice around the country and decarbonize our society. Its local chapters contribute to local grassroots environmental campaigns. This internship allowed Interns to identify our specific interests within the vast world of local environmental politics. With access to a plethora of varied meetings and webinars put on by varied environmental groups (both private and governmental), we possessed the ability to gain at least a rudimentary level of understanding of different groups, organizations, and committees that are currently doing environmental work in Marin and California at large. We also engaged directly with the community by tabling community events and fundraisers. For my independent project, I researched and wrote about bidirectional charging capabilities of new electric vehicles and how this is transforming the electric grid of the county and presented my findings to the community. This internship was truly a perfect fit. I got a taste of all corners of environmental activism on the local level as well as a deep understanding of nonprofit work, which I intend to further pursue in my career.

IR28 The Place Youth Services, Colorado Springs

Student Intern: EmRhys Jenkins ‘26
Major: Sociology

This past summer, I interned at The Place Youth Services' Drop-In/Outreach Center which focuses on supporting homeless and at-risk youth. My role involved going on outreach 2-3 times a week, connecting with youth actively on the street to provide essential physical resources such as food, water, and hygiene products, as well as offering a connection to The Place's broader services. I also worked directly with youth at the Drop-In Center, assisting in daily operations and fostering relationships. Additionally, I conducted research and helped plan for the establishment of a Youth Advisory Board, aimed to ensure that youth voices are heard in shaping resources for homeless youth and the future of Colorado Springs. This experience has reinforced my belief in the power of direct support and youth-led initiatives as key components of meaningful change.

IR29 Scuba Junkie, Sipadan, Sabah, Malaysia

Student Intern: Gina Jeong ‘25
Major: Political Science

I had the opportunity to participate as a Divemaster Intern at Scuba Junkie Sipadan (SJS), one of the most renowned diving companies in the Southeast Asia region. The dive center is on the remote island of Mabul, an hour boat ride away from the nearest land city, Semporna, where the office is located. Divers from all around the world come to dive at this famous spot, and many also come to start their diving journey by taking open water courses at the dive center. My role as a Divemaster Intern was to assist dive instructors in various diving courses such as open water and advanced open water courses, and to guide fun dives at the reefs around Mabul and Kapalai islands. I gained foundational knowledge about the recreational diving industry and the role of a professional diver. This experience has exposed me to a career that I am genuinely passionate about and will continue to guide me through my next career experience and beyond.

IR30 Heritage Hall Elementary Schools, Oklahoma City, OK

Student Intern: Jaden Kirby ‘25
Major: Education

This summer I had the opportunity to intern at Heritage Hall Schools, a successful private school in Oklahoma, whose goal and mission are to instill in their students a responsibility to Learn with Honor, Lead with Courage, and Serve with Compassion. During this experience I was able to engage with all happenings of an elementary school: full classrooms of elementary students, taking co-teacher positions, testing my teaching ability in a natural classroom setting, performing maintenance where needed, reviewing and discussing curriculum, creating lessons for teachers when needed, and even eventually being hired to work as a substitute teacher for the beginning of their school year. Through this I realized I want to be in Elementary Education, I found my confidence in the classroom, and I was even asked to return to teach in a full-time position upon my completion of college.

IR31 Combatives Center of Excellence, United States Air Force Academy, Colorado Springs, CO, & Denver Sports Recovery, Denver, CO

Student Intern: Emma Krasemann ‘25
Major: Business, Economics, and Society

I had the privilege of being a Human Performance Intern for the Combatives Center of Excellence at the United States Air Force Academy for the duration of their Master Instructor Course. This course teaches active-duty personnel and officers in the Air Force to perform in high stress environments and develop a growth mindset by learning verbal and physical management skills and ethical decision-making, which are skills required in hand-to-hand combat in a close-quarters engagement between combatants. My role as a Human Performance Intern was collecting and entering descriptive and heart rate data into Excel and Python and effectively communicating statistical insights to my supervisors. I also helped create and administer stress and response exercises. These exercises were administered both in the Academy’s Human Performance Lab and combatives-designated rooms. I also had the opportunity to work for Denver Sports Recovery (DSR), a rehabilitation center offering the most cutting-edge equipment designed to help patients attain optimal recovery. DSR makes the high-quality sports recovery services that professional athletes depend upon available to people of all ages and fitness levels. As a Recovery Specialist Intern, I gained experience in using a variety of therapeutic modalities, including E-Stim, contrast tubs, infrared saunas, soft tissue treatments, and cryotherapy, and learned how to perform injury assessments and develop tailored routines utilizing the modalities at DSR. The experience was very hands-on, and I was fortunate to have supervisors who were determined to help me learn by doing.

IR32 LongPath Technologies Inc., Boulder, CO

Student Intern: Jackson Kresse ‘25
Major: International Political Economy

I spent the summer working at LongPath Technologies, a startup company specializing in methane emission detection technology for the oil and gas sector. In this role, I mainly worked alongside the financial and sales teams to support and inform company strategy. For example, I was asked to develop pricing and deal analysis models, create TAM estimations for expansion into new geographic locations, and advise in monthly revenue reporting meetings. I also assisted the company’s accounting department in generating monthly and quarterly financials, giving me insight into the financial workings of a Series A/B startup company. Overall, this experience was an excellent first look into the culture and operations of a start-up company and interesting exposure to the energy sector as a whole. I am looking forward to applying the quantitative and qualitative skills I learned in this role to my future endeavors.

IR33 Leave No Trace, Boulder, CO

Student Intern: Ting Lester ‘27
Major: Undeclared

Leave No Trace is a national nonprofit organization that utilizes science and research to educate and equip people with the necessary skills to be a part of the solution for land protection. I was given a behind the scenes look at how the nonprofit functioned, from finances and communication to coordination and outreach. I updated the website, organized legal documents, and created a comprehensive report for Leave No Trace’s activity in all 50 states. I also tabled at the RockyGrass festival in Lyons, CO. The time spent with Leave No Trace taught me how to be a better communicator, researcher, and critical thinker, but it also gave me a glimpse at how uplifting and vibrant a work community can be.

IR34 Flying Pig Farm, Manitou Springs, CO

Student Intern: Natalia Maahs ‘25
Major: Molecular Biology

This past summer, I worked at Flying Pig Farm, a local community farm just 15 minutes from Colorado College. Flying Pig is a learning space for community members, kids, or any curious people. The farm hosts programming, workshops, meals and other events to cultivate community and provide hands-on educational experiences. I was very involved with weekly farm camp where kids age 6-16 come to the farm to learn about animals, sustainable agriculture, and just get to be kids! I also helped organize and promote various community workshops throughout the summer. Day-to-day, I got to spend lots of time with goats and chickens on the farm and learn about a variety of native and cultivated species in the garden. I gained a deeper understanding of what it means to cultivate community and care for the land we live on.

IR35 People of Purpose FL, Palm Beach County, FL

Student Intern: Charles Maier ‘26
Major: Political Science

This summer I was lucky to get an internship at People of Purpose FL, which aims to decrease the rate of recidivism in Florida. With my classmate Sara Moreau, I was involved in marketing and data analysis that directly aided newly released individuals and their families. Some of the work included creating effective Instagram posts to ensure people received information about the organization, developing Google Sheets that would help the newly released client provide their information easily, and assisting in the funding of emergency housing for families. The most enjoyable part of the internship was watching how our efforts assisted families to settle in stable environments during a crucial period. I was able to gain knowledge on data-driven decision making and community-centered marketing. This experience helped me gain insight into social impact work and encouraged me to learn about the possibilities to create a change.

IR36 People of Purpose FL, Palm Beach County, FL

Student Intern: Sara Moreau ‘26
Major: Political Science

This past summer, I served as an intern at People of Purpose FL, where I worked to help reduce recidivism rates across Florida. Alongside my fellow intern Charlie Maier, I split my time between marketing initiatives and data projects – work that directly supported individuals transitioning from incarceration back into their communities. Our projects ranged from crafting compelling Instagram content to raise public awareness, to developing streamlined Google Sheets systems for tracking new program participants. We also played a key role in securing critical emergency housing funds for families facing immediate needs. What struck me most was seeing our efforts translate into real change for families working to start fresh. The partnership with Charlie showed me firsthand how collaboration and innovative thinking can strengthen community support programs. Throughout the internship, I gained valuable hands-on experience while advancing a cause that drives meaningful social change.

IR37 Clark Lab, University of New Mexico Psychology and Clinical Neuroscience Center, Albuquerque, NM

Student Intern: Ana Martin ‘25
Major: Neuroscience

Memory consolidation during sleep is a crucial function of everyday life. Memory loss also presents a problem with broad social and economic implications. This project tested closed-loop auditory stimulation as a mechanism to improve memory consolidation, stress, and anxiety in healthy adults. Auditory stimulation was timed to slow-wave oscillations during sleep using live data from a 2-electrode electroencephalogram. Memory consolidation was assessed using two learning tasks in the morning and evening and sleep quality was self-reported. Salivary cortisol samples were taken bi-daily as a measure of stress and anxiety was assessed via an online questionnaire given to participants post-sleep. Because the study is ongoing, my role in the project was primarily data wrangling and cleaning. Previous studies by suggest there may be minor effects of closed-loop auditory stimulation on language learning.

IR38 Baldwin Wealth Partners, Marion, MA

Student Intern: Drew Marvel ‘27
Major: Economics

This internship offered a unique opportunity to gain hands-on experience in the wealth management industry while working closely with seasoned professionals. My responsibilities included researching and analyzing various financial instruments, including stocks, bonds, mutual funds, and alternative investments. I also assisted in evaluating investment opportunities and assessing risk-return profiles. I was required to stay abreast of market trends, economic developments, and regulatory changes affecting the financial services industry, and help generate insights and recommendations for clients based on market analysis. I also performed various administrative tasks as needed, including data entry, filing, and organizing documents to ensure accuracy and completeness of client records and reports.

IR39 National Women’s Studies Association, Baltimore, MD (remote)

Student Intern: Brailey Harris ‘26
Major: Feminist and Gender Studies

Over the summer, I worked as a fellow for the National Women’s Studies Association (NWSA), the leading association of Women and Gender Studies in the U.S. I had the opportunity to develop two independent research projects as well as work directly with NWSA’s national office on annual conference preparations. In my first project, I researched development resources, including books, workshops, reflection journals, virtual and in-person meetings in order to create a database of accessible, professional development resources for underrepresented faculty and administrators. In my second project, I began developing a master list of foundational feminist texts, creating an educational library through which educators and students can have meaningful conversations inside and outside the classroom. I also assisted in work directly related to NWSA’s annual conference, drafting panel sessions and creating social media content to promote the conference. This invaluable experience has taught me how to engage in accessible knowledge production and dissemination in my major. I have gained insight into a future filled with learning, researching, and working within academia and beyond.

IR40 Miami Water Keeper, Miami, FL

Student Intern: Kelli Miller ‘25
Major: Environmental Studies

Miami Water Keeper is an organization of environmental advocates that plays a huge role in protecting South Florida’s waterways. Their main focus areas are clean water, ecosystem protection, and sea level rise resilience. They implement science and environmental policy to stand up for South Florida’s waterways. They have been very successful with their initiatives, most notably their complaint against the U.S. Army Corps of Engineers and consequently the secured restoration of more than 10,000 corals. They currently have 13 open lawsuits, each ensuring a clean and resilient future for Miami. I had the opportunity to intern under the chief of staff assisting in marketing, policy, education and outreach. Before this experience I wasn't sure which side of environmental work most interested me. I found that I am especially drawn to policy. Gaining exposure to the different focus areas of the organization was my primary goal this summer, and my role definitely allowed me to do that.

IR41 Grow Good, Los Angeles, CA

Student Intern: Emily Newhall ‘25
Major: History-Philosophy

Located across the street from Los Angeles’ largest homeless shelter, Grow Good is a nonprofit urban garden providing nature-based healing through food, jobs, skills training & wellness programs for individuals experiencing homelessness. By facilitating transitional employment to houseless people, providing fresh produce to the Bell Shelter, conducting ecotherapy based programs, and serving as a nature space within the city, Grow Good uses urban agriculture to transform communities. Within the organization, I worked as an intern and contributed through manual labor and artistic endeavors. From watering the wildflower patch to helping facilitate volunteer days to packing produce orders, I helped where help was needed. I learned incredible strategies to regenerate urban land and grow food organically, while simultaneously learning about the epidemic of houselessness in Los Angeles. The opportunity to witness and contribute to a space which combines urban gardening with community wellbeing was invaluable.

IR42 Ellen’s Flowers, Cañon City, CO

Student Intern: Anna Peck ‘27
Major: Organismal Biology and Ecology

Ellen’s Flowers is a non-certified organic flower farm located in Cañon City, CO. They make fresh cut bouquets which are sold at weekly farmers’ markets and do design work for weddings and events. All of the flowers are grown on their 5-acre farm using organic practices. The fluid nature of farming allowed me to get involved in many tasks throughout the summer, such as weeding, harvesting, and bouquet making. Lots of other jobs came up as well that helped me add even more skills to my repertoire: we built a new walk-in cooler for the flowers, and I helped move and reconstruct irrigation lines. I also worked at a few farmers’ markets throughout the summer, which was a great experience in customer service. This was an excellent opportunity for me to learn about small-scale agriculture and what it takes to run a business.

IR43 Rocky Mountain Wildlife Alliance, Sedalia, CO

Student Intern: Kelsey Pivnick ‘25
Major: Organismal Biology and Ecology, Pre-Vet track

During my Wildlife Medicine Internship, I served as a Veterinary Intern at a Wildlife Animal Hospital and Rehabilitation Center. I gained hands-on experience in the restraint and medical and mental care of mammals, birds, and reptiles, administering medications and participating in various forms of emergency and critical care. My role involved assisting with basic examination and surgical procedures, rehabilitation steps, diet and enrichment coordination, and advanced veterinary techniques. Additionally, I collaborated closely with rescuers and the Licensed Wildlife Rehabilitator on intakes and patient records, ensuring accurate documentation and communication. I worked with a dedicated medical team to provide exceptional patient care, which contributed to the successful recovery and release of many animals back into the wild, solving crimes with local law enforcement, and education programs to increase human-wildlife coexistence in our community.

IR44 The Stillman Lab, San Francisco State University, San Francisco, CA

Student Intern: Abby Rivas ‘25
Major: Organismal Biology & Ecology

This summer, I worked as a Research Assistant at The Stillman Lab at San Francisco State University focusing on ecophysiology of Petrolisthes cinctipes (Porcelain Crab). I initially was assisting a graduate student in their project on transgenerational plasticity in *Petrolisthes cinctipes* through animal husbandry, microscopy, and field collection. Once those skills were established, I began my own research on *P. cinctipes* embryos and the effect of acute thermal stress across stages of embryonic development. With a field team, I collected eight adult females with recently oviposited embryos, extracted the embryos, and spent 10 weeks heat shocking and imaging each one. Once all embryos either hatched or expired, I used FIJI to analyze the size and rate of yolk consumption for each individual embryo. I learned the ImageJ Macro coding language and developed code to analyze approximately 4,000 images, in addition to developing an image converter code to cut the embryo imaging time in half that is still being used in The Stillman Lab. Once all images were analyzed, I used R to analyze percent yolk cover and develop figures to visualize results. I am in the process of analyzing the data to determine this study’s findings which is included in my developing manuscript and senior thesis.

IR45 Institute of Cognitive Neuroscience at University College London, London, UK

Student Intern: Gracie Roe ‘25
Major: Psychology

I had the incredible opportunity to aid various research projects at University College London’s Institute of Cognitive Neuroscience; one of Europe’s top universities for psychology and neuroscience research. I was a part of Professor Sophie Scott’s lab, which works primarily with the neural substrates responsible for the perception of speech and non-linguistic acoustic sounds. More specifically, I helped analyze non-verbal patterns of laughter and crying, organized conversational data of turn taking in both neurotypical and autistic participants, and sought to uncover the brain’s processing of several aversive and pleasurable auditory stimuli. The internship enabled me to dive deep into the intricacies of fMRI experimental designs including setup, recruitment, and data collection processes. I also shadowed various participant testing sessions and built strong relationships with coworkers. This experience is invaluable to my transition from undergraduate studies to postgraduate education and in the decision making of my future career path.

IR46 Cedars Sinai, Los Angeles, CA

Student Intern: Luke Sadhwani ‘25
Major: Molecular Biology

This past summer I had the opportunity to intern at Cedars Sinai as a research intern in the Vascularized Composite Allotransplantation Lab. I assisted with daily procedures, learned and observed various lab techniques, and performed data analysis. Additionally, I had the opportunity to read several papers and complete presentations on them, create my own scripts in R Statistical Computing for data analysis, and became fluent in FlowJo, a software that is absolutely critical in the analysis of flow cytometry data. Through this experience, I got a good look into the daily life of a lab technician and learned what goes into keeping a lab functioning at a high level.

IR47 National Weather Service, Charleston, SC

Student Intern: Sienna Schaay ‘27
Major: Environmental Science and Chemistry

I had the privilege to intern at my local National Weather Service forecasting office in Charleston, SC. The forecast office is responsible for the weather forecasting of 20 different counties across southeast South Carolina and Georgia, along with portions of the local coastal water. The forecast office works to provide weather, hydrologic, and climate forecasts for surrounding areas along with issuing watches and warnings for people who are at risk of severe weather. I researched the effects of how increased river discharge upstream contributed to tidal departures downstream, and to get a better understanding of how other variables can affect the departures as well. Along with my research, I shadowed different forecasting shifts and was exposed to AWIPS technology learning how to better interpret radar. I was able to practice in real time with issuing warnings, amending TAFTs for local airports, issuing LSRs, and more. This valuable experience has helped me have a better idea of what my future career could look like, and to the struggles, demand and unpredictability of weather forecasting.

IR48 Riguer Silva LLC, & Acquisition Title LLC, New Orleans, LA

Student Intern: Rio Shattuck ‘25
Major: Psychology

At Riguer Silva LLC, an immigration and personal injury law firm, I worked as a paralegal intern. I was immersed in a Spanish-speaking environment, translating legal documents and interacting directly with clients. My job involved completing and submitting asylum applications and work permits, as well as conducting research on human rights violations in our clients' home countries to build the strongest possible cases. Highlights of the internship were completing my first case, getting an asylum case approved, and on my final day, seeing the total number of cases I had finished. This experience provided a deep understanding of immigration law and a rewarding sense of contributing to real change by getting asylum seekers their status. I also worked as a clerical intern at Acquisition Title LLC, a company focused on real estate transactions like title research, leasing and development. My job included organizing files, preparing paperwork for civil court filings, and tracking down client payments. As part of the role I learned how courthouses carry out their daily functions, and how to prepare and file papers related to sales or mortgages over property.

IR49 Little Gem Farm, Chester, NY

Student Intern: Kayla Shelley ‘26
Major: Environmental Studies

I had the opportunity to intern with Little Gem Farm at the Chester Agricultural Center. As an Environmental Studies major, I wanted to gain experience working not only with the land directly, but within the greater community of the Hudson Valley in New York to bring organic produce to people in an accessible manner. While on the farm, I spent time building fences, trellising vegetables, mowing, weeding, harvesting, and transplanting vegetables from greenhouse to field. I was able to learn about soil silence, germination timelines, weather conditions and the impact of climate change on farming in New York. While running the Community Supported Agriculture (CSA) and working at the farmers market in Nyack, NY, I engaged with local farmers and shoppers. We also set up our SNAP benefits and EBT program to work directly with locals to bring greater access to people who otherwise were not able to afford to eat local organic vegetables. I was able to work directly with the land and my community, bringing into play all the principles I have learned in my EV classes here at CC.

IR50 Spectio, Seattle, WA

Student Intern: Nathan Shields ‘26
Major: Economics

I interned as a Product Manager at an early stage B2B tech startup in Seattle called Spectio. This hybrid role gave me the opportunity to experience the tech industry firsthand and engage with a Founder and CEO almost every day. While there was virtually no formal structure and training, every day presented me with new challenges where I could learn on the job and make an impact. Almost every week brought a new daily routine, forcing me to think quickly, collaborate effectively in teams, and take initiative. After getting my feet wet in many aspects of the business from BDR and product management to feature development and product marketing, this summer experience has narrowed my focus and strengthened my confidence in pursuing a career in tech.

IR51 Lift Urban Portland, Portland, OR

Student Intern: Jayd Sollinger ‘25
Major: Environmental Science

Lift Urban Portland is a nonprofit organization dedicated to reducing hunger and creating a community in Portland, OR, where everyone has access to healthy food. I contributed to a variety of roles, from supporting the warehouse and collaborating with other local nonprofits to working at the pantry, gleaning surplus produce, and distributing it to those in need. This hands-on experience strengthened my leadership skills, enhanced my ability to work in challenging situations, and deepened my commitment to addressing the intersection of environmental and social issues.

IR52 U.S. Senator Tina Smith, Washington, DC

Student Intern: Will Sylvain ‘25
Major: Political Science

This summer, I interned in the office of U.S. Senator Tina Smith. Senator Smith, elected to the Senate in 2020 by the great state of Minnesota, advocates for the diverse needs of Minnesotans and makes policy that will benefit as many of her constituents as possible. She has offices in St. Paul, MN and in Washington, DC. The St. Paul office is a more local, Minnesota-focused team, while the staff in Washington, DC have a more national scope, working very closely with offices of other Senators to pass legislation. As the Press Intern in the DC office, I worked closely with the communications team writing press releases, speeches, video remarks, social media posts, and a monthly newsletter to constituents. I was also in charge of the "press clips," which summarize Senator Smith's coverage in the press each day. Every weekday morning, I put together a rundown of the news articles, TV programs and radio shows that mentioned Senator Smith, and sent them to the staff in both offices, as well as Senator Smith. I was
part of an intern class with 3 legislative interns, and together we were also in charge of staffing the front desk, answering the phones, and logging constituent mail that came into the office every day.

IR53 Lown Cardiovascular Group, Boston, MA

Student Intern: Ellie Visser ‘25
Major: Molecular Biology

This summer I had the privilege of working at Lown Cardiovascular Group, a concierge cardiovascular practice in Boston, MA. What really intrigued me about the Lown Group was their commitment to proactive, personalized, and preventative healthcare. Lown acknowledges that treatments will differ based on the individual patient’s varying needs and prioritizes prevention rather than intervention, allowing for less invasive and tolerable medicine unless circumstances deem necessary. Under the teaching of their two exercise physiologists, I learned to screen patients prior to their tests to gain a better understanding of their medical history, perform electrocardiogram (EKG) monitored stress tests, and stress tests accompanied by echocardiogram for patients aged 60-80. During these tests I properly prepped patients for their EKG, monitored heart rate, took manual blood pressures, monitored their EKG for any arrhythmias, and wrote reports following their test to summarize how their heart responded to stress-induced exercise. During my time with the Lown Group, I gained immense knowledge through this immersive experience and had many opportunities to learn from not only the exercise physiologists, but also the sonographers and physicians, immensely expanding my knowledge of the heart and heart disease. I am so grateful for this experience that I would not have gotten had I not traveled across the country this summer.

IR54 Fulbright Association, Washington, DC

Student Intern: Anna Wooster ‘25
Major: Political Science

My internship with the Fulbright Association (FA) in Washington, DC focused on helping facilitate the planning of Fulbright events, culminating in the 2024 Fulbright Annual Conference. FA is an American nonprofit that focuses on international dialogue and people to people diplomacy via the Fulbright program. The Fulbright Association works as tangential to the State Department-backed Fulbright Program. It is one of 70 Fulbright alumni Associations globally and has hundreds of chapters nationwide. I worked specifically under the Events and Marketing team, but also helped contribute to Fulbright Association and State Department data source sharing, vetting fellowship applications, and managing the virtual conference programs. This internship allowed me to develop a better understanding of the Washington, DC nonprofit x private x government ecosystem. I came away with a much stronger sense of how these three sectors intersect in the policy processes in DC. This opportunity legitimized my skills in policy writing, communication, and grant-based initiatives.

NON-PRESENTATION INTERNSHIP REFLECTIONS

Nacional Committee for United World College (UWC) & Helping Hands, La Paz, Bolivia

Student Intern: Galilea Berthon ‘26
Major: Film and Media Studies

I had the opportunity to work with both the Nacional Committee for UWC in Bolivia and Helping Hands, two organizations dedicated to education and social impact in La Paz, Bolivia. At UWC Bolivia, I handled a range of responsibilities, including social media management and organizing the Immersion Weekend for the class of 2027. I oversaw planning every detail of the weekend, from booking accommodations to arranging activities, while also promoting the event through social media. This experience allowed me to give back to the organization that provided me with life-changing educational opportunities. At Helping Hands Bolivia, my role focused on filming and social media strategy. I led the creation of a video series that showcased the success stories of former students who had received financial support from the NGO and gone on to build stable careers. These videos not only inspired current students but also served as an effective tool for engaging and attracting donors. This project allowed me to apply my filmmaking skills to a cause I deeply care about, while gaining hands-on experience in nonprofit operations. These internships gave me the opportunity to use media as a powerful tool to drive social change.

Auric Gallery, Colorado Springs, CO

Student Intern: Rachel Boardman ‘25
Major: International Political Economy, **Minor:** Art History

Working with gallery owners, Abigail Kreuser and Gundega Stevens, I got to dive into the local art scene. I helped curate and design exhibition spaces and even assisted clients in creating personalized art setups. I also managed rotating exhibitions and got to interact with a wide range of artists. This internship allowed me to put my International Political Economy major and Art History minor to work in a practical setting, while also building my communication and networking skills. Living in Colorado Springs gave me a great balance between work and exploring the area, which really helped me grow both personally and professionally. This experience has clarified my career goals, and I’m now more committed than ever to pursuing a future in the arts.

Rocky Mountain Biological Laboratory, Gothic, CO

Student Intern: Sophia Bograd ‘26
Major: Chemistry

Rocky Mountain Biological Laboratory (RMBL) is one of the leading field biology research stations in the world and is home to several long-term studies on plant evolution, pollination, and animal behavior. For my internship, I worked with the Campbell lab to collect data and complete an independent research project. I spent most of the summer in the field, collecting data for long term studies on how climate change will impact pollination networks. I also worked with my lab group to design and conduct my own field experiment, studying how the size of flowers affected which pollinators visited them. As part of my independent project, I wrote a research proposal, analyzed my data using R, wrote a research paper, and presented my results at a research symposium. My internship with RMBL was exceedingly impactful. By conducting my own research project and receiving lots of feedback and revisions from my lab group, I improved my scientific writing skills and learned how to make effective scientific presentations and design field biology experiments. I also was able to get to know dozens of PhD students, postdocs, and professors, engaging with them about graduate school and career goals. Finally, spending a summer living in such a close-knit community meant forming many close relationships and lifelong friendships.

Earthen Hollow, Old Fort, NC

Student Intern: Anna Brief ‘25
Major: Art Studio

I had the enriching experience of interning at a farm focused on communal living practices. My days were filled with a diverse range of tasks, from landscaping and cultivating vegetables to tending the land and caring for animals. I gained hands-on experience in sustainable farming techniques and learned the intricacies of maintaining a harmonious farm ecosystem. In addition to my agricultural duties, I contributed to the community by helping prepare and share communal dinners, fostering a strong sense of togetherness and collaboration among the farm's residents. This internship not only honed my practical skills in farming and land stewardship but also deepened my appreciation for communal living and the importance of cooperative effort in achieving common goals. The experience was a profound blend of hard work and community spirit, leaving me with lasting memories and valuable lessons.

Nickel Up Media, Boston, MA

Student Intern: Julian Clark ‘26
Major: Theatre

I had the opportunity to work as an intern for Nickel Up Media, a podcast/interview company. Nickel Up Media hosts entrepreneurial guests who have taken an unconventional route to success. Given the nature of the guests, Nickel Up takes the approach of a free flowing, gently guided conversation rather than a stiff, intense interview. During my time interning, I gained experience with equipment operation, set design, outreach, and marketing. Working with a creative media company who is successful in making their vision work in this age of social media provided valuable skills important to my growth and understanding as a student majoring in the arts. As an artist, I must learn to use social media to push my work to gain an audience; this means learning how to appeal to an algorithm. Having a chance to experiment with this over the summer was great practice; working under a creative media company was essential to my understanding of life after graduation.

Best Case Studios & Cinematographic Apprenticeship with Marco Toro, New York, NY

Student Intern: Niko Cvitanic '25
Major: Film and Media Studies

During my summer in New York, I completed two transformative internships in digital media production. At Best Case Studios, I honed my skills in content creation, project management, and post-production. Working with cinematographer Marco Toro, I gained expertise in technical aspects of cinematography and learned to execute a director's vision effectively. These experiences enhanced my storytelling abilities, expanded my professional network, and strengthened my portfolio. I developed a deeper understanding of production hierarchies and team dynamics, crucial for maintaining safe and efficient sets. My technical repertoire grew significantly, as did my appreciation for the collaborative nature of filmmaking. This foundation has prepared me well for a future career in the field. Additionally, my passion for dancing led to an unexpected opportunity to create content for a local LGBTQ+ friendly club, allowing me to support an inclusive community while practicing my photography skills in a vibrant nightlife setting.

Wesley Bell for Congress, St. Louis, MO

Student Intern: Ben Dubinsky ‘25
Major: International Political Economy

I served as a Political Intern on the Wesley Bell for Congress team as we ran for the Democratic nomination in the race for Missouri’s 1st congressional district. Wesley, the challenger in this race, was running to unseat incumbent Congresswoman Cori Bush. Much of the work I was doing was centered around introducing voters to a new face who they may have been unfamiliar with in the past. I led teams of volunteers on community canvasses (knocking doors), organized parade floats, staffed fundraisers, and conducted extensive opposition research. My summer had a nice mix of intellectual and non-intellectual work that allowed me to apply theory from the classroom to both the construction of campaign materials and the successful execution of campaign activities. However, above all else, I developed extensively as a leader and communicator. Whether it was leading groups of volunteers or communicating key research findings to the campaign manager, I was able to understand the nuances of relationships, a helpful tool that allowed me to contribute my best work to the campaign team.

Genetic Mapping of Alzheimer’s Disease (AD) and Traumatic Brain Injury (TBI) at Ohio State University, School of Medicine, Columbus, OH

Student Intern: Mauricio Erazo Jr., Dec. ‘24
Major: Molecular Biology

This past summer, I worked as a Transcriptomics Research Assistant in the Harari Lab at Ohio State University School of Medicine. My primary focus was on a project investigating the connections between Alzheimer’s disease and traumatic brain injury. As part of my internship, I developed skills in reading and analyzing updated literature on neurodegenerative disorders. I also learned how to code, which allowed me to connect human and mouse brain data from various brain sections that the lab had collected. In addition to coding, I participated in research presentations, joined lab meetings, and collaborated with team members and external researchers. I was also introduced to the process of writing papers for publication, providing me with valuable experience in scientific communication and project development. This internship gave me hands-on experience in transcriptomics research and enhanced my understanding of how computational approaches can be applied to complex neurological disorders.

Film Industry Production Intern for Halogen Cinema, San Diego, CA

Student Intern: Joshua Fairmont ‘25
Major: Film and Media Studies

Halogen Cinema is a fully creative house that produces anything from feature films to Super Bowl commercials. My responsibilities varied from day-to-day assisting as needed. I made script breakdowns and shooting schedules for feature films, tested camera gear, and helped organize and track equipment. On set, I would assist the camera team as well as the grip team, making sure everything aligned with the Director's vision. The company is made up of some of the most kind and funny people I have ever met; they create an amazing work environment. Halogen Cinema provided an incredible, hands-on experience in many different departments allowing us to explore which field we might want to pursue more.

Harmony Montessori, Tiburon, CA

Student Intern: Kai Fogelquist ‘26
Major: Political Science

I worked with Wilana Anderson at Harmony Montessori, a small preschool that prioritizes outdoor experiences. The space centers self-discovery as a core value and I found each student to bring their own unique interests to the tiny preschool table. The school does a great job of fostering curiosity by letting students lead their own learning process. I worked as a teaching assistant learning how to establish classroom materials. We spoke frequently about the importance of the built environment and how you can set kids on a path of self-discovery. Simultaneously, I worked on my own lesson plan centered around the wonders of composting. I built a worm bin and taught the kids about life cycles and the importance of decomposers. I’m so grateful for the chance to share my love for the outdoors with a younger generation. I’m taking with me a full heart and tools to structure the Montessori teaching method.

Dzanc Books, Ann Arbor, MI

Student Intern: Esa George ‘25
Major: English

At Dzanc Books, I met weekly with our Editor-in-Chief, alongside a team of interns. We read manuscripts, sorted through submissions, and offered feedback continuously, while learning about the stages of publishing. We learned how to constructively sort through tons of manuscripts. This summer was one full of reading, editing, and deciphering what could best fit into Dzanc's mission; things that bring newness to the world of publishing and give new authors a chance.

Escola Comum, São Paulo, Brasil

Student Intern: Martina Hasler Arantes ‘25
Major: Sociology

This summer, I had the opportunity to participate in a hybrid position as a General Intern for Escola Comum, an NGO based in São Paulo, Brasil, that focuses on providing critical education to youth on the peripheries of the city. The institution offers classes every Saturday in four modules: Rights & Democracy, Economy & Sustainability, Public Policies Lab, and Contemporary Challenges. The classes follow a problem-based learning approach and are given by masters of the field, such as past Brazilian presidents, current ministers, professors and published authors, etc. Throughout my time, I participated in fundraising events and classes and researched topics for new projects and potential sponsors. I also gained foundational knowledge in the appropriate methods of communication for both customer and professional partners. This valuable, hands-on experience has exposed me to office dynamics and the work it takes to keep an NGO running.

Zumwalt Acres, Sheldon, IL

Student Intern: Yonah Kalikow ‘26
Major: Environmental Science

This summer I was a farm fellow at Zumwalt Acres (ZA), a regenerative farming project in rural Illinois based in Jewish and queer values. As a fellow I lived and worked on the farm with around ten other folks. My tasks included weeding, harvesting, pruning and preparing produce for distribution. Others on the farm tended to mushroom production, event planning, and art workshops. ZA is envisioned to be a project in sustainable land management, while creating a space for the local community, queer and Jewish groups. The fellowship emphasized community building and community care within the cohort. Together, we cooked elaborate meals, swam in Lake Michigan, and had context conversations. I learned about regenerative practices and had time to reflect on our current food systems in the United States. I highly recommend this fellowship for those interested in sustainable farming and intentional community!

Short Stack Press, Goshen, IN

Student Intern: Lucy Kramer ‘26
Major: Anthropology

Short Stack Press, a community letterpress studio, hosts community workshops, collaborative projects, sales, and studio space. The press does a mix of client, charity, and community artist projects. As an intern for Short Stack Press, I was included in the printmaking process from beginning to end. I designed and printed orders, helped make paper and prepare large orders, maintained the studio, participated in community studio and sales, planned and led a community poetry workshop. The Press has an anti-capitalist and social justice ideology, so I was able to work as an artist for these goals. This internship was collaborative and empowering to me as a young artist. I developed my letterpress skills through both trial and error, and instruction while also having time to develop and create intentional book arts (my minor). Furthermore, I saw how this craft connects across the region, visiting other book centers to make paper, using local paper mills, and collaborating with local artists.

LiveToCreate, Sydney, Australia

Student Intern: Ely Longwill ‘25
Major: Political Science

Live To Create is a creative agency specializing in crafting high-impact digital marketing assets. Over the past 10 weeks, I had the opportunity to work on 10 productions across various industries, including tourism, products, events, and fitness. I gained valuable hands-on experience in developing and executing creative campaigns for our clients. From pitching and ideation sessions, I learned how to effectively target key consumers, address their pain points, and highlight our clients’ unique selling points. In post-production, I was trained to work efficiently, delivering high-quality results quickly to meet client demands. In addition to external production work, I also managed our social media accounts. I developed over 20 trending social assets for the company, leveraging popular content to increase our follower count by 4,000 (a 400% increase). This internship has been an amazing journey, and I’m excited to continue my path in digital marketing and production.

Western Organization for People Living with AIDS/HIV (WOPLAH), Mumias Town, Kakamega County, Kenya

Student Intern: Willow Lott ‘27
Major: International Political Economy

My internship consisted of learning about AIDS and the grassroots work WOPLAH does to help people affected through various programs. This time was spent developing skills, getting to know the organization, and meeting community members. I also learned a lot about the grant application process. I read How to Become a Grant Writing Unicorn and listened to several podcasts to become familiar with successful narrative medicine campaigns. I then researched over 200 grants to create a master list of funding opportunities that might help WOPLAH cultivate an LGBTQ+ safe space. I drafted applications for two grants, a non-competitive microgrant, and a more robust large grant. I compiled several budget outlines, transcribed oral testimony from WOPLAH benefactors, and created new narratives for WOPLAH's scope of services.

Under the Radar Magazine, Remote

Student Intern: Marina Malin ‘25
Major: IDM: The Practice and Theory of Creativity

This summer I had the opportunity to be a music content writing intern for one of the most well-known music publications. Working as a remote intern for Under the Radar, I worked primarily on their website blog and social media platforms. Every day, I would write various news articles highlighting indie artist’s latest projects. I had the opportunity to write about incredible artists that are shaping the indie scene today. Since June, I have written over 150 news articles and reviewed new albums by Dr. Dog, Clairo, Bill Callahan, Water From Your Eyes, The Softies, Ray Lamontagne, and Bright Eyes. Aside from writing, I have formulated research for artist interviews and music projects, edited articles and interviews, wrote and scheduled social media posts promoting our content, formatted Song of The Week’s voting charts, along with writing Song of The Week posts. I gained knowledge of the music industry and what it takes to run a successful music publication during a time of declining publications and journalism.

CASA (Court Appointed Special Advocates), Fort Collins, CO

Student Intern: Carlie Malott‘26
Majors: Psychology and Education

I served as a Case Manager Intern, providing case management services, supervising child visits, and facilitating safe exchanges for children with parents involved in conflict or domestic violence. This role allowed me to improve my communication, observation, and de-escalation skills while gaining a deep understanding of trauma-informed care and nonprofit operations. Through this experience, I achieved my goals of exploring social work, enhancing professional skills, and supporting diverse families. Inspired by my work at CASA, I plan to pursue a graduate degree in psychology, focusing on child psychology or social work, with an emphasis on trauma and family dynamics. This internship solidified my passion for making a meaningful impact on the lives of vulnerable populations.

Food to Power, Colorado Springs, CO

Student Intern: Brian Marks ‘25
Major: Molecular Biology

I was motivated to work with Food to Power because of my interests in equitable food access. Although the world produces such huge quantities of food, the equitable distribution of food remains poor despite such wealth. I believe that practices of community farming and redistribution of food waste like those used by Food to Power will produce more equitable and resilient food systems across the world. I also became more familiar with cultivating crop plants from seed to harvest. I plan to work in plant biology fields related directly to agriculture such as plant breeding or plant genetic engineering, wherein knowledge of growing is crucial. I was able to learn this information and put it into practice through cultivating a variety of edible crop plants at Food to Power. This internship has left me better prepared to pursue these career paths.

National Women’s Association, Virtual

Student Intern: Auna McConnaughey ‘25
Major: Feminist and Gender Studies

I had the incredible opportunity to participate in a remote position as a Fellow at the National Women’s Association (NWSA). NWSA supports and promotes the production and dissemination of knowledge about women, gender, and sexuality through teaching, learning, research, and service in academia and beyond. I worked with the National Office conducting an independent research project, creating designs, and assisting with planning and scheduling for their 44^{th} annual conference. I gained knowledge on how to collect research and information that will be distributed to NWSA’s members, including students and higher education academics. My research consisted of identifying and providing contact information for the 792 Women and Gender Studies (WGSS) Programs, both undergraduate and graduate, across the nation. I was able to create valuable relationships with both NWSA and the other fellows that will guide me through my career experiences following graduation.

Centre for Applied Nonviolent Actions and Strategies (CANVAS), Belgrade, Serbia

Student Intern: Mila Naumovska '26
Majors: History and Political Science

I had the opportunity to intern at CANVAS, a Belgrade-based organization dedicated to promoting nonviolent resistance and providing training for pro-democracy movements around the world. I worked closely with the team to research and analyze nonviolent movements, contributing to various projects that aimed to strengthen civic engagement and democratic resilience in regions facing authoritarianism. My responsibilities included creating reports on historical and contemporary movements, assisting with workshops for activists, and helping to develop training materials on strategic nonviolent resistance. This hands-on experience allowed me to deepen my understanding of global democratic movements while developing skills in research, communication, and advocacy. It has also reinforced my commitment to supporting peaceful, sustainable social change in the Future.

National Women's Studies Association, Towson, MD

Student Intern: Italia Quintana '25
Major: Romance Languages

As a Summer Fellow, my responsibilities included independent and collaborative research, content creation, and resource development aligned with the mission. Key tasks included benchmarking for accessibility and conference preparation, researching local organizations for the annual conference, and expanding resources for accessibility. My efforts involved creating social media content templates, infographics, and scheduling posts for key initiatives. I also assisted with the Association's website and contributed to projects with the Conference Accessibility Chair while exploring feminist issues in education and global communities.

Great British National Committee for United World College & Family Futures, London, UK

Student Intern: Ben Ruddock '26
Major: Psychology

I had an exciting opportunity this summer with two internships where I got to learn more about myself and what I want to do in the future as well as support two incredible organizations in continuing their powerful and necessary work. My first internship was with the Great British National Committee for United World College (UWC). I organized an orientation weekend to prepare 16 & 17-year-olds for going to a UWC. I was tasked with coordinating families, new students, volunteers and all the activities that they would participate in over the weekend. In my second internship, I worked with a nonprofit; Family Futures, which provides therapy services to adopted children and their families; in particular, complex trauma therapy, so they can thrive in their ever-changing worlds. I supported their research by reading the histories of a group of children who were unable to receive Family Futures services to determine the likelihood of them having Fetal Alcohol Spectrum Disorders (FASD).

The University of Wyoming Department of Applied Economics, WY

Student Intern: Emmet Shuman ‘26
Major: Mathematical Economics Major, **Minor:** Computer Science Minor

This summer I worked under Professor Kristiana Hansen, who specializes in water resource economics, and collaborated with one of her graduate students, Catherine Grant, who was completing her MS on the effects of commercial water pricing structures on water usage within the Colorado River Basin. My work focused on collecting, cleaning, storing, and analyzing price elasticity of commercial and residential water demand data from several counties in Wyoming including Afton, Cheyenne, and Pinedale. The position allowed me to learn about and begin modeling economic principles such as price elasticity of demand, that is, how pricing and structure variation may affect the demand for and use of a given commodity, in my case, water. I also was able to develop a range of analytic skills such as data management, for instance, acquiring data from local government offices and learning the basics of developing a SQL-based database; I also practiced and expanded upon my coding skills, using R to perform critical data quality control. Finally, I honed some professional skills, working in close collaboration and communicating with faculty and graduate students completing their master’s degrees.

LaiSun Keane, Boston, MA

Student Intern: Kira Smith ‘25
Majors: Art: Museum Studies & English: Creative Writing

In the summer of 2024, I interned at LaiSun Keane, a gallery in Boston's SOWA district that supports underrepresented and emerging artists. I worked on two exhibitions: "Calibration," a ceramics show featuring East Asian female artists utilizing new technology, and "La Toilette," which offered diverse perspectives on the art historical theme of bathing. My responsibilities included handling artwork, installation, and curatorial design. I also created press releases, label text, collectors' catalogs, and certificates of authenticity. I even spearheaded an educational social media campaign to raise awareness for up-and-coming artists. During the final exhibition, I moderated an artist talk between three artists of different race, education, gender, and background. This experience provided deep insight into the complexities of gallery operations, particularly in fostering meaningful support for artists and their work. It was rewarding to see my contributions adopted and implemented, offering both professional growth and a closer connection to the art community in Boston.

Persona, New Haven, CT

Student Intern: George Sowles ‘25
Major: Mathematics and Computer Science

This past summer I was a Software Engineering intern at Persona, a personality application and social network company. I worked hybrid, with most of my time spent in northeast Vermont. I worked on creating the main MVP for the company. This involved primarily working with Node and React components as well as querying information. I was in charge of a small team that implemented an artificial intelligence component into the app. The purpose was to show compatibility insights between people. As it would be computationally expensive to manually do each matching, we implemented AI to do this for us. The project was a success. I also wrote a good portion of the front end for the project. Separate from programming I was involved in the marketing of the application. We used Instagram and Google ads to build a strong user base. When I started with the company, I was employee number 5 and we had 100 users. The code I wrote helped grow the company to 15 employees and over 1000 users. I am extremely grateful for the work I was able to accomplish last summer.

Frontline Healthcare Partners, Charleston, SC

Student Intern: Bobby Spence ‘26
Major: Economics

Frontline Healthcare Partners (FHP) is a firm that invests in micro-cap distributed healthcare. The portfolio companies consist of ABA therapy, Infusion therapy, MAT therapy, and child and adolescent psychiatry. I had an unbelievable experience working at the firm as I got hands-on experience with private equity and making strong investments while also focusing on the operational side of things and helping the companies grow. I created several white papers on different industries within distributed healthcare, such as healthcare education, specialty eye care, and my final project which was pediatric speech therapy. I found industries that not only interested me and that I could see success in, but also industries with impressive CAGRS (compound annual growth rate) and good management teams. I would look for prior PE involvement in the industry. I would pull together the most influential people in the industry so then the partners at FHP could reach out to them and potentially get them on the FHP board, because the more knowledge we have of industries, the better. I had to learn attention to detail at a whole new level. I needed to create the most visually appealing PowerPoints while also having a ton of information per slide, and that took a lot of organizational skills that I did not have when I first started the internship.

Mucker Capital, Santa Monica, CA

Student Intern: Luke Stefanski '26
Major: Business, Economics and Society

I had the opportunity to participate in a hybrid position as an Intern at Mucker Capital, a leading venture capital firm focused on backing early-stage startups. Mucker Capital invests in companies at the earliest stages of development, providing funding, mentorship, and guidance to help founders grow and scale their businesses. I worked within the investment team, where I engaged in deal sourcing, conducted due diligence on potential investments, and assisted in evaluating emerging trends across multiple sectors. My responsibilities included analyzing market opportunities, developing financial models, and preparing pitch decks for partner meetings. Additionally, I contributed to Mucker's portfolio support initiatives by working closely with several startups. This experience gave me deep insights into venture capital processes, startup ecosystems, and investor relations, which will be instrumental as I continue pursuing a career in finance and entrepreneurship.

Believe Apothecary, Aspen, CO

Student Intern: Penelope Thornton ‘25
Major: Southwest Studies

This summer I worked with my family on our family business. The apothecary was born out of a passion for learning about the wild foods and medicinal plants of the Roaring Fork Valley and Aspen area, where we are based. Over the past year we have developed the business, and this summer we had our first market stand, selling tinctures and topical herbal salves at the Basalt Farmer’s Market. Throughout the summer, I developed products, worked on social media and marketing, and helped run the farmers market stand every Sunday. Sharing plant medicine with my community has given me a sense of purpose and human connection that I have never experienced before. I am on track to becoming a registered herbalist and hope to expand the business when I graduate, hopefully opening a storefront and continuing to develop our herbal product line in the coming years.

Timber Point Capital, Briarcliff, NY

Student Intern: Ryan Trapasso ‘25
Major: Economics

This summer at Timber Point Capital, a boutique investment firm in New York, I gained hands-on experience in investment management and financial analysis. I conducted comprehensive evaluations of companies like Disney, Toyota, and WD-40, utilizing various valuation models and financial metrics. A key project involved creating investment theses for the firm's holdings, requiring in-depth analysis of financial statements, market trends, and growth metrics. I participated in weekly investment calls, discussing market performance and strategies with clients. The internship provided insights into emerging market trends, including the impact of AI stocks, international opportunities, and the effects of macroeconomic factors on investments. I also researched alternative ETFs for SEC compliance and analyzed the potential impact of partnerships in the EV industry, such as the Volkswagen-Rivian deal. This experience significantly enhanced my understanding of financial markets and investment strategies, providing valuable skills for my future career in finance.

Douglas County Open Space, Franktown, CO

Student Intern: Molly Widlund ‘25
Major: Anthropology, Minor: History

I had the opportunity to conduct archival research and develop interpretive historical signage for public education at Prairie Canyon Ranch, a historic ranch property owned and managed by Douglas County Open Space. Douglas County Open Space seeks to improve the quality of life for Coloradans by protecting and giving access to historic properties and the county's cultural heritage, wildlife, and natural resources. Over the course of 2 months, I spent time in the Douglas County Library archives, researching the property’s history, and developing signs to improve public education and access to the property and its rich history. I gained skills in public speaking/tour guiding, archival research, historical interpretation, communication, and sign development for public education. This meaningful internship gave me the freedom to learn and do archival work, and creatively problem solve on how to educate the public in a concise yet meaningful way, which has given me invaluable experience to carry forward into anthropological and historical fields for future jobs.

Hensch Lab, Harvard University, Cambridge, MA

Student Intern: Ella Yolen ‘26
Major: Neuroscience

As a research intern, I worked on a project studying the effects of early-life stress on cognitive development later in life. I took recordings of mice with varying strains and care types and organized this process. I helped train a neural network to classify mouse ultrasonic vocalizations by analyzing recordings. Additionally, I stained cell samples, used a microscope to figure out what stage of the estrous cycle the female mice were in, and observed mouse surgery. I presented my findings monthly to lab scientists across Harvard University and Boston Children’s Hospital. This opportunity allowed me to better understand the research process and provided insightful experience to prepare me for my future career.

The African Institute for Development Policy (AFIDEP), Lilongwe, Malawi

Student Intern: Oliviero Zanalda ‘25
Major: Political Science

I had the amazing opportunity to intern at AFIDEP, an African-led and staffed think tank that focuses on creating and proposing policy to African governments. AFIDEP focuses on Population Dynamics and The Demographic Dividend, Health and Wellbeing, Transformative Education and Skills Development, The Environment and Climate Change, and Governance and Accountability. What separates AFIDEP from other think tanks is their commitment to well-formatted, insightful research and evidence-based decision making when drafting policy, making sure every piece of the policy proposal is supported with clear, presentable evidence. I worked on two of the current projects - Leaving no-one Behind: Transforming Gendered Pathways to Health for TB (LIGHT), and Advance Domestic Health Financing (ADHF). Through the LIGHT project, I sat on the panel for the PhotoVoice project, helped review the policy briefs for various countries including Nigeria and Uganda, and helped gather evidence for the various proposals developed by the project. For the ADHF project, I helped edit various budget analyses and helped research and write the preliminary economic assessment of African Drug Development. This experience underscored the vital role African-led think tanks and NGOs play in researching and addressing the continent's challenges. By combining personal perspectives with an understanding of how African governments operate, AFIDEP and similar organizations can make a difference. Additionally, working at AFIDEP showed me the importance of well-researched policy and how, when implemented correctly, can create real change.

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