ILLINOIS COLLEGE

CELEBRATION OF EXCELLENCE

ABSTRACTS

April 21, 2023

CONTENTS

CELEBRATION OF EXCELLENCE 2023
Abstracts

DIVISION I :: ORAL PRESENTATIONS

Research on Cuba-US Relations
Elena Teresa Carrera
Faculty Sponsor: Diana Grullón-García

The well-known Cuban writer Fernando Ortiz (1881-1969) studied Afro-Cuban culture with an anthropological approach through a literary lens. He created the concept of 'transculturation' in his renowned book Contrapunteo Cubano del Tabaco y el Azúcar (1940) (Cuban Counterpoint: Tobacco and Sugar) to debate the term 'acculturation', previously created by Melville Herkovitz (1895-1963). His work is an anthropological study, but also a literary text since it centers on the use of metaphorical resources to explain Cuban culture. My project aims to build a better understanding of the cultural dynamics in Cuba, the Caribbean, and the United States. For this purpose, last May I went to Cuba to study its culture through methodological observation, focusing on Cuban culture and its cultural devices such as texts, religious practices, and other artistic representations. Through Ortiz's concepts and work, my project emphasizes how literary devices help us comprehend different cultural dynamics in Cuba and the Caribbean. Ortiz's concept of 'transculturation' shows the transdisciplinary nature of Cultural Studies; it depends not only on the anthropological perspective but also on the uses of other disciplines. My research outcomes put to light the importance of understanding cultural dynamics and their representations in our societies.

A Senior Showcase: Visible Learning
Caleb Fink, Eduardo Fulgencio, Janessa Grammer, Mellody Horchem, Ella Middleton, Anna McKee, Noah Postin, Jonathan Kobby, Jordan Bethany, Trent Stamer
Faculty Sponsor: Katelyn Pattillo

The *Department of Communication Arts* is presenting work from four seniors that are graduating with a degree in Art and Design in Visual Studies. These students have spent countless hours giving shape to their individual sensibilities and convictions as artists. *Visible Learning* is a showcase of versatility in subject, medium, and style. Informed by their personal experiences, each student works in the medium of their choice, combining their years of education to focus on one theme for their thesis work. These projects highlight a deep commitment and faith in the relationship between thinking and making, between seeing and learning.

Students will discuss their exploration, research, and experimentation with materials and mediums that helped them reach their conclusion of visual expression. Remember this is all about trusting the process, mark by mark you will start to create what leads you ahead.

Literature and Illness: English Senior Seminar Panel
Aly Johnson, Kyler Kantor, Kendall McCalla, Allison Woosley
Faculty Sponsor: Beth Capo

This panel features four papers written for the English Senior Seminar in the fall. The presentations work together to highlight what people can learn from medical literature and the process of developing an original literary argument. The first paper examines how mental illness is represented, as well as how these representations affect readers in three primary texts. The presentation will speak to how the portrayals of mental illness can have broader impacts outside of the texts. The second paper revolves around Leo Tolstoy's *The Death of Ivan Ilych* and the relationship between the titular character, his illness, and his own ego. The paper goes in-depth into how Ilych's illness warped his view of the world and his own self-image. The presentation will ultimately focus on the formation of the paper and how applying modern research can give audiences a fresh perspective on an 18th-century text. The third paper discusses how transgender women write about their transitioning experience in memoir and the burdens that the medical system puts on women who medically transition. The paper also discusses how these burdens have changed and stayed consistent throughout history. The final paper explores the criteria of a high-functioning patient in the mental health care system today by identifying individuals present in each narrative and using guidelines created by Esmé Weijun Wang in *The Collected Schizophrenias*. The paper later evaluates this label and the resulting hierarchy of patients as it relates to proper mental health care access.

Forte Literary Journal: A Reading of Poetry and Prose

Kendall McCalla, Ava Maria Mendoza, Sandra Norville, Ren Parks, Edris Roman, Rachael Rosenstengel, Serenity Vasquez

Faculty Sponsor: Kara Dorris

The editors and contributors to IC's student-run literary journal, Forte, will talk about their work and read their poems and stories. Our creative works are meant to read aloud and shared, not just read on the page.

New York Times Project: From ABCs to US Civics

Sarra Faust

Faculty Sponsor: Adrienne Hacker-Daniels

In 1969, a revolutionary program appeared on television for the first time which we know as *Sesame Street*. Not long after, in 1973, *Schoolhouse Rock!* made its mark on television as well as in the field of education through children's programs that provided an entertaining pedagogy by including catchy songs in pursuit of providing important lessons in civics. However, in the years since these very influential shows premiered, over the last five-plus decades, their messages have gradually evolved with different effects on different generations of viewers. In this panel presentation, these messaging shifts are discussed given the changes in viewers from Generation X to Generation Z. The methodological approach analyzes the message themes found in *Schoolhouse Rock!* and *Sesame Street*, specifically through the prisms of the informative and deliberative genres of rhetoric. Comparisons are made of each show's messages through the decades and the ways those messages influenced the generations that watched those programs and the ways those programs were influenced by the generations. This research applies media effects theories in illuminating the ways that the media adapt messages to different generational audiences.

New York Times Project: Controversial Commercialism: Vice and Virtue in the 2023 Super Bowl Advertisements

Mikhayla Haloftis

Faculty Sponsor: Adrienne Hacker-Daniels

The Super Bowl draws around 100 million viewers, making it advertisers' most profitable night (Graham & Coffee, 2023). Advertisements for the Super Bowl run 7 million dollars for a 30-second spot, which makes the perception of these advertisements very important (Graham & Coffee, 2023). This enables companies to display their products and services to a critical mass, and this opportunity potentially brings huge profits. Throughout the years of televising the Super Bowl, controversies have ensued regarding advertisements that have pushed the envelope. Three controversial topics appeared in Super Bowl 2023 advertisements. Those topics of controversy involved gambling, drinking, and religion. This panel presentation explores the legal and ethical dimensions of commercial advertisements aired during the Super Bowl. Advertisements that broached these controversies included beer and distilled spirits companies such as Bud Light, Michelob Ultra, Busch Light, and Crown Royal, the online gambling site of DraftKings, and the religious ad titled "He Gets Us." Methodologically, the rhetorical analysis examines the visual and textual meanings of these advertisements, through legal, cultural, and ethical lenses.

The Art of Storytelling through Lighting Design and Directing

Sandra Norville

Faculty Sponsor: Nancy Taylor Porter

When telling a story on stage, different artists and practitioners contribute a variety of components to the work as a whole. Directing and lighting design are two of the most critical in the process of effectively producing a work of theatre. Directing brings the text to life, while lighting enhances the mood and can accentuate themes within the play or interpretations central to the director's vision. In my presentation, I explain the different elements of lighting design, such as color, intensity, duration, movement, and focus, and how these can enhance storytelling. With directing, I explain how I have used techniques developed by Sanford Meisner and Jerzy Grotowski, which I have found essential in connecting actors with their bodies, characters, and eventually scene partners. I also present live demonstrations of lighting techniques, elements of design, and, finally, my direction of a scene from an original play, *Iridia's Curse*.

Brain Hamsters: An Original Composition for Concert Band by Kailee Eldridge

Kailee Eldridge, Illinois College Band

Faculty Sponsor: Christian Secrist

This presentation showcases my experience as a composer and a musician in the IC Band. Last fall, I completed an honor's project in which I composed a short piece titled "Brain Hamsters" for the band to perform during their fall convocation concert. There are a variety of convocations held each semester designed to provide enhanced learning opportunities to students. The convocation theme for this academic year is "The Power of the Mind" and focuses on the role our minds play in learning, creating, and developing relationships, as well as mental health issues. I was challenged to compose a piece that reflected this theme. I worked with Dr. Secrist, our band director, to create a piece that was both practical for the time constraints and aesthetically pleasing to the audience. From the perspective of a first-time composer, I walk the audience through the process that I used to create my piece and the inspiration behind it. I discuss how the convocation theme, a song I studied in a music history course, and my own experiences influenced my composition. From the perspective of an ensemble member, I share what it was like to rehearse my own composition leading up to the performance and the experience of hearing it for the first time in concert. At the end of my presentation the IC band gives a live performance of "Brain Hamsters."

DIVISION I :: POSTERS

Europe in 1989

Madalyn Coats

Faculty Sponsor: Bernd Estabrook

The Berlin Wall was a guarded concrete barrier that divided Berlin, Germany from 1961 to 1989. After World War II, Germany was split into different occupied zones with Berlin being divided in two, the West being controlled by the Western Allies and the East being controlled by the USSR. The Wall was built by East Berlin to prevent its population from escaping to West Berlin. There has been a lot of debate over what caused the Wall to fall on November 9, 1989. The goal of my research is to identify historical documents that are useful for teaching purposes in a course dealing with the events of 1989. I developed an evaluative rubric to assess documentaries' relative value and veracity. The rubric includes, but is not limited to, categories such as key persons, timeline examined, controversies, and noteworthy aspects. The documentaries were from the United States and Europe, and I examined them for accuracy and effective portrayal of key historical ideas. The rubric will be used to determine the potential for audio and visual materials to enhance the study of history in a course teaching the events of 1989. In order to understand what happened in Germany, one must also look at what was happening in the rest of Europe. It is important to include materials that look at the history of other countries in Europe so that students can learn the real story of the Berlin Wall. The interpretation of the events of 1989 is much broader and less obvious than I had originally believed, and there are some important divergences when assessing the root cause.

Interpreting the Europe of 1989

Arnaud Rioual

Faculty Sponsor: Bernd Estabrook

In 1989, the Berlin wall fell. It was one of the symbols of the Cold War and of the division of Germany, Europe, and of the world between capitalist and communist blocks. This important event had huge impacts on the world, and we still can see some of these effects today. Over the last five years, Dr. Estabrook collected numerous documents such as books, movies, and documentaries, but also hundreds of interviews in German of political figures and everyday citizens about this historical period. For this project, I analyzed and interpreted one hundred of these interviews to evaluate if they help our understanding of 1989. Some of these interviews were from top officials, such as the last leader of Eastern Germany, Egon Krenz, but also from everyday people such as a teacher.

DIVISION II :: ORAL PRESENTATIONS

Chemical composition of Ghost Orchid (*Dendrophylax lindenii*) floral nectar from Florida

Antonio Ruiz

Faculty Sponsors: Lawrence Zettler and Brent Chandler

Numerous studies have confirmed the importance of nectar for effective pollination and reproductive success in orchids, but the chemical composition of floral nectar has received surprisingly little attention. We report the chemical compounds present in the nectar of the well-known ghost orchid, *Dendrophylax lindenii* (Lindl.) Bentham ex Rolfe, using gas chromatography and mass spectrometry (GC/MS) analysis. This rare species exists as a leafless epiphyte in forests of south Florida and western Cuba and yields a striking floral display consisting of fragrant white flowers with long (11-17 cm) nectar spurs. Nectar samples were obtained from naturally occurring populations within the Florida Panther National Wildlife Refuge during July 2021 and analyzed in the laboratory 1 week later. Results revealed the presence of 3 sugars (glucose, fructose, sucrose), three acids (lactic, malic, threonic), as well as 4-hydroxyl benzyl alcohol. In addition, all three sugars were detected on the upper surface of flower's labellum where moisture is known to collect due to its concave shape. This study supports the contention that sugars are a ubiquitous component of orchid floral nectar, but the presence of the other compounds (acids) deserves further inquiry. Knowing more about the compounds in *D. lindenii* nectar will provide more insight into how and why hawk moths visit and pollinate the flowers of this rare orchid in the natural setting.

Identifying Potential Novel Antibiotics for Future Use

Devan Morgan, Nik Wollenhaupt

Faculty Sponsors: Brent Chandler and Gwendowlyn Knapp

The overuse of antibiotics in both clinical and agricultural settings has contributed to the global spread of multidrug-resistant (MDR) bacterial pathogens, resulting in over $2 billion a year in healthcare costs, and 70,000 excess global deaths. MDR bacteria are widespread and are found in populated areas, as well as isolated and remote areas such as the high arctic. Moreover, ESKAPE strains, which include six common pathogens with growing MDR issues, pose a threat to the human population because of the lack of effectiveness of antibiotics over time due to overuse and exposure. Developing new treatments to combat infections caused by these bacteria is important to tackling the MDR problem.

The acronym ESKAPE includes six nosocomial pathogens that exhibit multidrug resistance and virulence: *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter spp*. These are bacteria that need new therapeutics. To identify potential new sources of antibiotics, bacteria were isolated from environmental samples and tested for their ability to inhibit growth against the ESKAPE pathogens, and several antimicrobial-producing strains were isolated. These strains are being identified using classical microbiological techniques, as well as 16s rRNA sequencing. Further, the compounds that cause the disruption of microbial life are being isolated using liquid chromatography. We have begun to characterize these isolated compounds against the various ESKAPE strains.

When weeds collide: Natural colonization of chicory (*Cichorium intybus*) by dandelion (*Taraxacum officinale*) in a frequently mowed lawn

Isaac Phillips

Faculty Sponsor: Lawrence Zettler

In Illinois and throughout the world, exotic weeds continue to pose a serious threat to natural ecosystems by displacing or outcompeting native plant species. One well-known example is the dandelion, *Taraxacum officinale* Weber (Asteraceae), originally native to Europe and Asia. The tenacity of this species to colonize open spaces (e.g., lawns) is noteworthy. Even uprooted specimens in the act of anthesis can release wind-borne, single-seeded fruits (achenes) before dying, exemplifying this weed's ability to survive and prosper. We report the presence of a dandelion specimen growing from the base of an inflorescence stem of chicory (*Cichorium intybus* L.) rooted in the lawn of a church in Jacksonville, Illinois. The region of the stem where the dandelion was attached appeared as a swollen knot suggesting that the dandelion may have sprouted as a wind-born seed shortly after the lawn was mowed. It is conceivable that severing of the chicory stem from mowing may have provided the dandelion with a source of water exuded by the host's xylem resulting in a graft between these two weedy species. Given that both weeds belong to the same family (*Asteraceae*), subfamily (*Cichorioideae*), and tribe (*Cichorieae*) and are therefore closely related, this explanation cannot be ruled out. Efforts are being planned to carry out experiments in the laboratory to verify dandelion's ability to colonize chicory and other plant species through wind-born seeds.

Methods for studying the Green Sea Turtle (*Chelonia mydas*) and its nesting sites in Western Cuba

Justine Kennedy, Lydia Ballard, Julissa Contreras, Jenna Kenning, Isaac Phillips, Antonio Ruiz, Ainslee Stroup, Charles Veith

Faculty Sponsor: Lawrence Zettler

The Green Sea Turtle, *Chelonia mydas* (Reptilia: Cheloniidae) is a large (1.5 m long, 200+ kg.) marine reptile found in warm tropical and subtropical oceans throughout the world. Populations of this species have declined over the decades due to human activities (*e.g.*, hunting, entanglement in fishing nets, habitat loss) and natural causes (*e.g.*, shark predators, diseases), and it remains globally listed as Endangered by IUCN. In western Cuba, females of this species return annually to nesting sites along sandy beaches in Guanahacabibes National Park in mid- to late summer, depositing upwards of 100 eggs per turtle in nests that they build during the night (usually 10 p.m.-4 a.m.). Researchers affiliated with the University of Havana have been studying *C. mydas* nesting for many years, collecting detailed field data to monitor turtle numbers, survival, and other factors important for their conservation. During one week of August last year, we assisted Cuban sea turtle researchers in collecting and recording data that included measuring carapace (shell) lengths, tagging, counting eggs deposited in nests, and recording sea turtle hatchling numbers as they emerged from each nest. The data that the Cuban researchers recorded were then compared to data collected by researchers in the U.S. at nesting sites in S Florida to understand how scientists in both countries study sea turtles.

Isolation and provisional identification of mycorrhizal fungi from roots of orchids native to the Republic of Palau in the western Pacific.

Courtney Lercher, Alyssa Wiseman

Faculty Sponsor: Lawrence Zettler

Located ca. 1,000 km from the Philippines at the eastern edge of Wallace's Line lies the Republic of Palau, a small (535 km2) archipelago with ca. 100 known orchid species, including 32 endemics. In 2017, the Palau Orchid Conservation Initiative, spearheaded by the North American Orchid Conservation Center (NAOCC), was established to study the mechanisms contributing to an unusually large number of endemic species, and to develop protocols for conservation. Among the project collaborators include the U.S. Forest Service, Palau Division of Forestry, and Ngardok Nature Reserve. Illinois College's role in this ongoing collaboration involves the isolation and storage (cryopreservation) of putative mycorrhizal fungi for use in seed germination experiments. Considering that all orchids rely on specific fungi for seed germination and survival *in situ*, more information about their mycorrhizal fungi is needed in this age of extinction, especially in Pacific islands vulnerable to sea level rise imposed by climate change. In January 2023, live root samples harboring fungi from 23 orchid species were transported to Illinois College's USDA-certified quarantine facility under permit (*e.g.*, CITES, phytosanitation). Of 194 root segments, each measuring 1 cm in length, only 19 (9.8%) contained pelotons. Thus far, seven putative mycorrhizal fungi, assignable to all three primary genera associated with photosynthetic orchids worldwide, have been isolated in pure culture. *Tulasnella* was isolated from *Bulbophyllum betchei*, *Crepidium setipes*, *Morenhoutia* sp. and *Sarcanthopsis woraqueana*, whereas *Ceratobasidium* was present in *Peristylus palawensis* and *Taeniophyllum palawense*. *Hetaeria oblongifolia* also harbored *Serendipita* – a genus infrequently isolated from orchids worldwide.

Collecting wild orchids from an exotic Pacific Island for scientific study: No easy task

Luke Settles, Charles Veith, Lydia Ballard

Faculty Sponsor: Lawrence Zettler

Collecting and importing living orchid samples into the U.S. from overseas is a complicated legal and logistical process that requires permission from the host country for export and import permits from the country receiving the samples. The U.S. Government imposes strict import regulations aimed at keeping noxious pests from entering our country, usually administered through the USDA (APHIS). The process begins with a CITES certificate (Convention on International Trade in Endangered Species) that ensures the movement (trade) of plant and animal species does not threaten their survival. Amongst plants, orchids are perhaps the most sought-after group by collectors worldwide, and securing CITES paperwork is both difficult and cumbersome, even for scientists who seek samples for non-commercial purposes. Dating back over a decade, Illinois College's Orchid Recovery Program has received four such CITES permits for samples collected in Madagascar and the Republic of Palau, including a recent trip to the latter country in January of this year. Because living orchid roots harbor a group of fungi that are regarded as noxious pests, the U.S. Government requires a USDA PPQ-526 permit for their import, and a heavily restricted facility to house the root samples that are granted to a select few institutions. Illinois College's Parker Science building has one such facility. This talk will highlight our efforts to collect and transport orchid root samples in Palau alongside researchers from the Smithsonian Environmental Research Center, and their transport to Parker's USDA-certified facility for scientific study.

DIVISION II :: POSTERS

Using Automated Recorders to Study Social Calls of Insectivorous Bats in Siloam Springs State Park

Ainslee Stroup

Faculty Sponsor: Bryan Arnold

This research project focuses on the analysis of different types of social calls in insectivorous bats. Our goal is to discover if certain types of social calls are more prevalent in a specific species of bat, in a specific area, and during a specific time of day or year. The area of study is Siloam Springs State Park. Recorders were set up in various locations, which began recording May 16, 2022 until August 22, 2022. Data cards were collected from the recorders every two weeks. To analyze the recordings, we used a program called Kaleidoscope, which uses a species call library to classify the recordings to the species level. During the analysis of recordings, files were marked if they contained a call that was not a normal echolocation call - i.e. a social call including constant frequency calls, upsweep calls, etc. Currently, we are focusing our analysis on files that contain single species social calls. This means that for a social call to be counted it must be from a single species throughout the entire recording. So far, we have analyzed data for recordings from May 16, 2022 to June 13, 2022. Future work will continue to analyze the recordings we have from over the summer.

Tyrosinase Inhibition by 4-hydroxyindole

Max Balding, Ashleigh Forsting, Payton Koester, Peyton Phillis, Cynthia Tran

Faculty Sponsor: Zvi Pasman

Tyrosinase is an enzyme that is found in many different plants and organisms. It is essential for the formation of melanin in skin and browning of fruit. In order to study the activity of tyrosinase, we focused on enzyme inhibitors in the conversion of the substrate 3,4-dihydroxyphenylalanine (DOPA) to the dopachrome product. This study was conducted with the intent of characterizing the inhibitive properties of 4-hydroxyindole due to its structural similarity to the substrate. 4-hydroxyindole was added to the reaction at three different concentrations. In steady state kinetic measurements, the kcat parameter was not affected, whereas the apparent KM was increased, arguing that 4-hydroxyindole is a competitive inhibitor of tyrosinase. The data yielded a Ki of 11 μM. Kojic acid, a known competitive inhibitor of tyrosinase, was found to inhibit the reaction with a Ki of 7.9 μM. We conclude that 4-hydroxyindole is a competitive inhibitor of tyrosinase that acts similarly to Kojic acid.

Testing the Domain hypothesis of self-healing in Disperse Orange 11 dye-doped PMMA

Carson Beyers

Faculty Sponsor: Josiah Kunz

The self-healing properties of dye-doped polymer preforms have been studied to determine dye structure within the polymer. However, the structure of the domains formed by the Disperse Orange 11 (DO11) dye has yet to be extensively studied. This research sought to replicate previous RSoXS and GIWAXS experiments. Existing results suggest an isosbestic point at concentrations of 4, 5, and 6 weight percent of DO11 in PMMA. Samples were sent to ASL at Berkeley for the synchrotron experiments. Additionally, the polymer samples are being tested for self-healing properties. A polymer sample is lased and produces amplified spontaneous emissions (ASE) which are indicated by emitted red light. As the sample burns, the polymer structure degrades, and the ASE decreases. Given time to regenerate in the dark, the sample once again produces ASE indicated by the emittance of red light. The RSoXS and GIWAXS data are consistent with research conducted by past graduate students. We conclude that the GIWAXS data is unable to determine the domain structure of DO11 within the polymer of the spin-coated samples. RSoXS data is currently still being analyzed to determine if the isosbestic point is replicable or extends beyond the limits of the 4 and 6 weight percentages.

Preparation and preliminary application of imidazolium ionic liquids of varying carbon-chain length

Eduardo Fulgencio

Faculty Sponsor: Jocelyn Lanorio

Ionic liquids (ILs) are defined as molten salts or compounds entirely composed of ions with melting points below 100 C. Their properties such as being non-flammable, non-volatile, and non-combustible make them promising alternatives for volatile organic solvents.

We synthesized and characterized a series of imidazolium ionic liquids with varying carbon-chain lengths. Because ionic liquids have high thermal stability and low solubility in water, we then tested their applicability as solvents and catalysts in biphasic reactions.

Particularly, we looked at the hydration of benzonitrile using only water and IL. We utilized those ionic liquids with higher density than water to allow biphasic catalysis.

Characterization of the ILs and their efficiency as catalysts were monitored using spectroscopic techniques such as IR, UV-Vis, and NMR. Conversion of benzonitrile to benzamide was reported as % conversion using the GC-MS peak integrals. We successfully synthesized a series of imidazolium ionic liquids. We also found out that two imidazolium ILs can serve as hydration catalysts exhibiting 59% conversion for 1-propyl-3-methylimidazolium bromide ([C3-mim]Br), and 34% conversion for 1-octyl-3-methylimidazolium bromide ([C8-mim]Br).

Analyzing Trends in Copper-Catalyzed Cycloaddition Reactions

Emma Green

Faculty Sponsor: Jocelyn Lanorio

1,2,3-Triazoles have several biopharmaceutical functions such as antiviral and antiallergic behaviors. The process to create these molecules involves the cycloaddition of an azide, an alkyne, and a catalyst. However, many catalysts contain rare metals that are costly and dangerous. The purpose of this study was to determine if copper is a viable replacement for these metals, and if so what reaction conditions are the most favorable. The copper catalysts were examined under different conditions. These were reactions containing solvent, neat (no solvent), with heat, and at room temperature. Additionally, the effect of the charge of copper was investigated. The importance of these variables was to find the most green combination of conditions; for example, a reaction not requiring solvent or heat would be considered ideal. The products were characterized by melting point, TLC, IR, and GCMS. The results indicated that copper catalysts provide a high yield of pure product, with neat conditions being the most efficient reactions. Furthermore, it was observed that the cycloaddition reactions can also be run at room temperature. The charge of copper does not appear to affect the reaction, although the stability and sterics of the anion attached to the copper do.

Effect Of Concussion History on Cognitive Function of Illinois College Students

Gabriela Argianas

Faculty Sponsor: Prasanna Acharya

Previous studies provided some evidence that young athletes can show cognitive deficits after experiencing a concussion earlier in life, and female athletes seem to show longer-lasting symptoms than male athletes. However, whether sex-related differences exist in cognitive functions among college soccer players is unclear. We examined the effects of concussion history (CH) among college male and female soccer players on their attention capacity and executive functioning compared to team members with no history (NoH). We hypothesized potential sex-related differences in cognitive processing between CH and NoH players. Our preliminary data set included 16 athletes, 5 CH players (> 2.5 yrs. post-concussion) and 11 NoH players. All players performed two cognitive tests on a laptop- i) Stroop color-word executive function and ii) A D2 sustained attention test. ANOVAs were used to analyze response time (RT; milliseconds), error rate (ER; %), and sustained attention score (CS; D2 test only) in males and females with CH and NoH. For the Stroop test, there was a significant interaction of Sex * CH on RT and no significant effects of Sex, CH, or Sex * CH on ER. The post-hoc test showed greater RT for CH females (+29%) than NoH females, independent of the test condition, and no differences between CH and NoH males. For the D2 test, there were no significant Sex, CH, or Sex * CH effects found for CS, RT, or ER. These preliminary data may suggest sex-related differences in cognitive function processing speed in college soccer players with/out concussion history.

Reducing Accidents on Green Street via Civil Engineering

Hunter Coultas

Faculty Sponsor: Josiah Kunz

Green Street is a county highway that is northeast of Centralia City. Hutchison Engineering Inc., a civil engineering firm, bid on a job that involves redesigning the road to be safer. Historically, Green Street has been prone to many automobile accidents. After a thorough investigation of the road, it was found that some aspects of the road, such as the superelevation on the curves, were up to standards as set by the Bureau of Design and Environment Manual and the Bureau of Local Roads and Streets Manual. However, other aspects of the road, such as the lack of a shoulder along the edges, could be improved. Moreover, some portions of Green Street have a steep drop (<4:1 gradient) on the edge of the road. The solution was to add a four-foot aggregate shoulder along the entire length of the road. However, adding this shoulder came with further considerations; for example, all the ditches were also pushed out four feet. This meant all the ditch work and corresponding culverts had to be redesigned. Currently, the project is in its prefinal phase and submitted to the Illinois Department of Transportation for review.

Characterizing the Function of Unknown Genes in *E. coli*

Jesus Ruvalcaba

Faculty Sponsor: Gwendowlyn Knapp

Sequencing genomes has been an important part of modern biology. There are a multitude of organisms that have had their partial or complete genome sequenced, and among them, *E. coli* has been the most useful to researchers. Even though its genome has been sequenced, not every gene has been assigned a clear function. Characterizing the function of these genes in bacteria like *E. coli* can provide valuable insight into how bacteria can adapt to new environments. The LysR-Type Transcriptional Regulators (LTTRs) is the largest family of transcription factors in *E. coli*. Amongst their many functions, the LTTRs allow *E. coli* to fix nitrogen, respond to oxidative stress and use cyanate. Of the 47 members, many remain uncharacterized, including YidZ, YgfI, YeiE, YfeR, and YeeY. To begin characterization of these proteins, the genes of interest were amplified and cloned into pET28a+, a high-copy, inducible plasmid. The plasmids were then transformed into BL21 (DE3). These constructs were later induced with IPTG at different concentrations and temperatures in order to produce the proteins of interest. In order to determine if these cells were properly induced and producing the proteins, samples were loaded onto an SDS-PAGE. Our results showed that the proteins of interest were not being induced. More research is needed in order to find what exactly is hindering the induction.

Analysis of distress call variability in evening bats (*Nycticeius humeralis*): Do related bats give similar types of calls?

Jordan Morgan

Faculty Sponsor: Bryan Arnold

The purpose of this study is to analyze social calls from evening bats, *Nycticeius humeralis*, that are produced when in distress, differing from typical echolocation calls. We use these analyses to see if there are any similarities or differences amongst the types of calls recorded from different individuals. With this information we can explore whether these distress calls warn other bats of danger, call them to help, or encourage other behaviors by the species. To gather this information, we captured *Nycticeius humeralis*—taking wing biopsies from each to eventually correlate their call structure to their genetic relatedness—and recorded them as they produced distress calls. Our methods for successfully receiving a distress call consisted of detaining the bat within our hand, exposing their mouth to receive a clear recording, tapping lightly on the bat to agitate it enough to produce a call, and alternating them between hands. We then analyzed these sounds in the Avisoft Bioacoustics sound analysis program to measure and characterize specific calls into unique groups. Thus far, we have found that distress calls contain elements that can be grouped into 8 different types of calls, with some being more common and frequent than others. This is an ongoing study, but future goals include having more concrete groupings for these call elements and then expanding the research to examine if there is any relationship between relatedness of bats and their calls produced. We hope to eventually answer the question of whether bats with genetic similarities make similar calls.

Testing for Drug Resistant Bacteria in Central Illinois Soil

Kendra LaMarsh

Faculty Sponsor: Gwendowlyn Knapp

Bacterial infections can harm humans, and often antibiotics are used to treat the infection. Antibiotic resistance is an issue due to overuse and misuse of antibiotics and results in higher medical costs, prolonged hospital stays, and increased mortality. According to the Centers for Disease Control and Prevention (CDC), in the United States alone, there are more than 2.8 million antibiotic resistant infections each year, resulting in more than 35,000 deaths. To address the issue of antibiotic resistance, we must first identify how widespread the problem is. Thus, we collected soil samples over a growing season from the Meredosia National Wildlife Refuge and a local agricultural site in Jacksonville, IL. The level of resistance to medically relevant antibiotics was determined by Kirby-Bauer assays. It was concluded that antibiotic resistance was present at each site, whether or not there is direct human contact. Kirby-Bauer assays suggest that a subset is resistant to one or more antibiotics.

Teaching a Physics II Class about Special Relativity Using a Video Game

Lucas Schultz, Noah Postin

Faculty Sponsors: Josiah Kunz and Katelyn Pattillo

Einstein's theory of special relativity uniquely relates space and time. Prior to Einstein's revolutionary work, scientists believed that time was absolute (e.g., if 1 second passes for you then 1 second also passes for me) and that length was fixed (you and I both measure a football field as 100 yards). While this is true at low speeds, it is not true near the speed of light.

Consequently, special relativity is a topic that, while not mathematically cumbersome, can be difficult for students to grasp. One reason is that there are no perfect analogies and very few ways to convey the topic in a laboratory setting. For example, to even begin to notice relativistic effects, you would have to be travelling at over 94 million miles per hour.

This project attempts to overcome the experiential problem with special relativity by developing a physics-based special relativity video game. The simulation utilizes simple 2D video game platforming and novel 2D art assets to engage students of all levels. Topics presented include development of the video game (computer science, art, level design, etc.) and pedagogical data from a real Physics II class that played the game as a lab.

Expression of Wnt/Beta-catenin Inhibitors in Neural Retina During *Xenopus laevis* Lens Regeneration

Maria Jose Hernandez

Faculty Sponsor: Paul Hamilton

The African Clawed Frog, *Xenopus laevis*, has the ability to regenerate numerous tissues in its tadpole stages, including the lens of the eye from the cornea epithelium. For lens regeneration to occur, unknown signals sent from the neural retina must reach the cornea epithelium. In order for this regeneration to occur, it has been shown that there must be a decrease in the Wnt/Beta-catenin signaling pathway. This suggests the expression of a Wnt signaling inhibitor during the early events of regeneration in order to suppress the signal, and one possible source of that signal is the neural retina. Using, *X. laevis* tadpoles stage 47-53, lentectomies (lens removal) were carried out to initiate regeneration. After 24 hours of regeneration, neural retina from the regenerating eye was collected and RNA was isolated and purified for quantitative RT-PCR. As a control, the neural retina was also collected from the eye without a lentectomy. ΔΔCt values were calculated to show the relative difference of known Wnt inhibitors (sfrps and dkks) between the two samples. While our work is still ongoing and more replicates are needed, early data appears to be consistent with an increased expression of some of these inhibitors during early regeneration events.

Disrupting Cornea Stromal Structure During *Xenopus laevis* Lens Regeneration

Marjori Russo

Faculty Sponsor: Paul Hamilton

Xenopus laevis, or the African Clawed Frog, is well known for its regenerative ability of the lens of the eye. After removing a lens from the tadpole's eye, *X. laevis* is able to regenerate it using signals sent from the neural retina and transmitted through cells located in the basal membrane of the cornea. However, these frogs lose this regenerative capability after undergoing metamorphosis. As the tadpole undergoes the necessary changes to become a juvenile frog, the once open space between epithelial layers of the cornea are lost as the stroma develops in these layers (Hu et al, 2013). From this point on, *X. Laevis* appears unable to regenerate a new lens. One of the main ideas about why this ability is lost is due to the development of the corneal stroma during metamorphosis. Post metamorphic regenerative capabilities were studied by Hamilton and Henry (2016), which concluded that these frogs still possess the capability to release signals that trigger lens protein formation in cornea cells, indicating that the structure of the cornea is still capable of receiving regenerative signals. Finding a way to disrupt the integrity of the cornea stroma would provide a clear picture of the potential role that it plays in limiting the regenerative ability of the lens through cornea cells. Recent work done by Kazaili (2020) successfully utilized amylase and collagenase to enzymatically degrade the integrity and thickness of pig corneas. This enzymatic work might also be utilized to degrade the stroma of juvenile frog corneas. The goal of this research is to use enzymes to degrade the stroma of *X. laevis*, allowing for the ability of the mature cornea to regenerate the lens.

Improve Usability of Virtual Reality by Using Spatial-Awareness Cross-Device Interaction

Aniya Pallera, Connor Warhausen

Faculty Sponsor: Zheng Huang

As the number of devices we interact in our daily lives increases, so does the need to optimize our interactions. Whether for personal, business, educational, or other purposes, an inefficient use of multiple devices can be time-consuming, decrease the user experience, and affect productivity. Our personal devices, such as phones and tablets, have built-in sensors that collect spatial data (e.g., orientation of phone, acceleration of movement) from the surrounding environment. This data has been used to develop many single-device interaction features such as detecting screen rotation and recognizing the user's physical activities (e.g., walking, riding, and running). In our study, we apply the built-in sensor (i.e., accelerometer) of a phone to realize spatial awareness cross-device interaction with a Cloud computing architecture that allows multiple devices to recognize their moving direction (i.e., up and down, left and right) by sending

and receiving raw data of accelerometers to and from our cloud server. Our approach could significantly lower the threshold of cross-device interaction (i.e., without the need for costly external sensors) and share the cloud computing resources based on scalability (i.e., adjusting computing resources as needed).

Preparation and Preliminary Application of Nickel N-Heterocyclic Carbene Complexes

Payton Koester

Faculty Sponsor: Jocelyn Lanorio

N-Heterocyclic Carbene (NHC) complexes are a class of cyclic compounds containing a divalent carbon atom with two neighboring nitrogen atoms. NHCs are widely used as ligands for transition metals, with extensive applications in catalysis and medicinal chemistry. They have been shown to demonstrate anti-cancer potential in medical research. NHCs are typically difficult to isolate as a single carbene monomer because they readily dimerize or react with water. However, NHCs can be stabilized conformationally by introducing substituents to the nitrogen atoms.

The purpose of this research was to develop a concise method to synthesize nickel and ruthenium complexes of two types of functionalized NHC ligands. We tested several different processes and found a synthetic method for the NHC ligand, IMes 1,3-Bis(2,4,6-trimethylphenyl)-1,3-dihydro-2H-imidazole-2-ylidene and its other derivative, IPr. The IMes and IPr ligands were then added to nickelocene to form CpNi(NHC)Cl. A similar procedure was followed for the ruthenium complex.

Characterization and purity determination were done using multinuclear NMR spectroscopy. Preliminary application of the synthesized Ni-NHC complex was also conducted with a chosen Suzuki-Miyaura cross-coupling reaction. We found out that our Ni-NHC complex has a potential to catalyze coupling reactions, indicating a 16% conversion via GC-MS.

Evaluating Hair Cell Damage in Neuromast of *Xenopus laevis*

Ronnautica Dixon

Faculty Sponsor: Paul Hamilton

The lateral line system is a detection mechanism of tactile sense organs within the water for aquatic vertebrates such as fish and amphibians, including *Xenopus laevis*. This lateral line system is composed of hair cells functioning as mechanoreceptors responding to movement, vibrations and pressure changes. To visualize the nuclei of these hair cells, we used the fluorescent dye YO-PRO-1, highlighting the neuromasts along the lateral line located around the left and right eyes of the tadpoles. Using *X. laevis* tadpoles at stages 32-40, we assessed the ototoxicity of three drugs: Kanamycin monosulfate, Chloramphenicol and Spermidine trihydrochloride. Hair cell damage was assessed by the failure to incorporate the YO-PRO-1 dye, allowing the use of fluorescent microscopy as a rapid method of screening potentially ototoxic drugs. Our goal is to assess *Xenopus laevis* as an alternative to the current zebrafish model (Chiu et al. 2008) for screening potentially ototoxic compounds.

Exploring new nickel-based catalysts for Suzuki-Miyaura reactions

Scott Huckabay

Faculty Sponsor: Jocelyn Lanorio

A Suzuki-Miyaura reaction is a cross-coupling reaction that attaches a compound to another compound by their sp2 carbons. While there are many different reactions that combine compounds together, there are only a few reactions that can combine compounds via their sp2 carbons. The Suzuki-Miyaura reaction often uses a palladium organometallic catalyst, PdCl2(PCy3)2. Previous research shows how NiCl2(PCy3)2 is an effective alternative to PdCl2(PCy3)2 in this reaction. This is important as nickel is significantly cheaper than palladium, with nickel costing around $0.69 per ounce while palladium costs $2000 per ounce. Furthermore, nickel is more readily available and less toxic compared to Pd.

The objective of this study was to explore more alternate nickel-based organometallic catalysts and compare their effectiveness to the standard and well-reported NiCl2(PCy3)2 complex. We tested various Ni-based catalysts to find their percentage conversion using GC-MS to detect the amount of reactant left and product formed. Alternatives that were found to have 100% conversion were then compared to NiCl2(PCy3)2 in four different Suzuki-Miyaura reactions by monitoring the %conversion at different reaction times. We found that NiCl2(DPPE) was the most effective catalyst in three out of the four chosen cross-coupling reactions. These results show that finding further alternate Ni-based catalysts could expand the repertoire of substrates and products that may be available for the creation of new molecules via Suzuki-Miyaura cross-coupling reactions.

Impact of Perfectionism on Psychological and Physiological Responses to Failure

Gabriela Argianas, Ali Daoud, Tyra Johnson, Evelin Lagunas, Brooke Sobkoviak, and Trent Stamer

Faculty Sponsor: Clarissa Richardson

Research suggests that self-critical perfectionism (SCP), a personality trait associated with self-criticism, is related to poorer affect and emotion regulation during failure (Woodrum & Kahn, 2022). Physiological (heart rate) has yet to be examined in this context. We hypothesized that individuals higher in SCP who experience high failure, compared to low failure, will be more likely to engage in poorer spontaneous emotion regulation and experience poorer affect and higher heart rate than individuals who are lower in SCP. Participants were randomly assigned to either a high failure ($N = 30$) or low failure ($N = 30$) 20-item anagram task modeled after Woodrum and Khan (2022). Participants were, on average, 20.7 years old ($SD = 1.5$), 71% female, 70% White. Regression results suggest a significant interaction between SCP and failure predicting rumination ($p < .01$), and a trending effect for negative affect ($p = .1$) and heart rate ($p = .1$). Individuals high in SCP reported high rumination and negative affect during/following the task, in both high failure and low failure conditions. Individuals low in SCP reported higher rumination and negative affect during/following high failure than low failure. However, among high SCP individuals, change in heart rate from baseline was highest during low failure and lowest during high failure. No baseline heart rate differences were observed, so perhaps rumination among SCPs during high failure played a role (e.g., distraction; Capobianco et al., 2018) in keeping heart rate from rising.

Cell Proliferation and Lung Tissue Regrowth in *X. laevis*

Suzie Green

Faculty Sponsor: Paul Hamilton

The respiratory system in *Xenopus laevis* is diverse and distinct from mammalian systems, given that respiration is not located in a single organ system, and the lungs are available to access externally. Because of the plasticity of many tissues within the *Xenopus* organism and the lack of complete reliance on the lungs for respiration, it was speculated that the lungs of the tadpoles might be capable of regenerating after mechanical injury. The distal tip of the lungs of stage 37-42 tadpoles was removed through pneumonectomies, and the animals were allowed to recover for time points varying from 24 hours to 21 days. After the recovery time was complete, the lungs were evaluated on a macroscopic scale by measuring the area of the distal tip, and a microscopic scale with antibody staining targeting the nuclei of dividing cells. Cell counts showed that the injured lung was not significantly more mitotically active than the control lungs at any point. Calculations of area showed that the injured lung was being outgrown by the control lung, indicating that the lung tissue is not regenerating. Although the tissue is not regenerating like initially proposed, there was some wound healing observed, providing a basis for future research.

Purification and Characterization of Diketopiperazine Antibiotics

Devan Morgan and Nik Wollenhaupt

Faculty Sponsors: Brent Chandler, Gwendowlyn Knapp

Since the inception of antibiotics, humanity has been in an “arms race”. We create new antibiotics. Bacteria become resistant. Unfortunately, the rate at which new efficacious antibiotic therapies are created is being outpaced by the rate bacteria become resistant. This has caused an increase in multidrug resistant (MDR) bacterial pathogens such as *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp. referred collectively by the acronym ESKAPE. There is a clear and pressing need to identify novel MDR antibiotics with unique mechanism of action that target the ESKAPE group. Looking to nature, we investigate microbes that produce these desirable molecular agents. We describe an effective strategy to purify and characterize antibiotics generated by isolated environmental bacteria. We report the purification of an aqueous supernatant broth by liquid-liquid extraction and silica gel chromatography that led to the structural elucidation of diketopiperazine antibiotic agents.

Reading into Anxiety: Associations Between Task Performance, Self-Report, and Physiological State while Reading

Allison Woosley, Payton Radcliffe, Jayden Kasai

Faculty Sponsor: Alex Moore

Reading anxiety is defined as feelings of negative affect experienced when completing reading-based tasks and is associated with deficits in processing while reading (Daley & Fischer, 2014). One explanation is that reading anxiety inhibits working memory, making it difficult for high-anxious individuals to perform reading-based tasks (Piccolo, 2016). In our on-going study we explored this possibility by measuring working memory, reading performance, and physiological responses associated with self-reported reading anxiety. Measures

of respiration, pulse, and electrodermal activity (EDA) were recorded while participants completed Yamashita's Anxiety Survey (YAS; Yamashita, 2013) to measure self-report of reading anxiety , the Reading Span (RSPAN; Unsworth et al., 2009) to measure working memory, and a reading task requiring a short passage be read aloud before taking a quiz on the content. Half of our participants were given notification of the quiz before reading the passage while half were unaware of the quiz.

A negative correlation was found between the number of idea units recalled from the reading and self-reported anxiety measures meaning that participants recalled fewer idea units if they reported higher levels of reading anxiety. There was also a negative correlation between respiration rates during the test and the number of idea units recalled.

Optimization of Ignitable Liquid Analysis on CG-Quad-MS System for Forensic Applications

Zachary Dimond

Faculty Sponsor: Clayton Spencer

Residues of ignitable liquids gathered as part of an arson investigation can be analyzed through a Gas Chromatography-Mass Spectrometry System (GC-Quad-MS) to identify if and what accelerants were used. This data can determine the liquid used to start a fire and cross-reference buying records to find a culprit. Mock arson scenes were created using an isolated fire within aluminum cans fueled by varying ignitable liquids on carpet samples. Residues from the burnt carpet were heated, in which residual vapors from the samples were absorbed onto a carbon strip, then extracted into a solvent, which the CG-Quad-MS can analyze. A processwas developed by which mock crime scene samples can be uniquely and accurately matched to known samples of the accelerants. This was done by direct comparisons of chromatographic and mass spectral data generated by the GC-Quad-MS. Optimizing this process is essential to successfully identifying and securing evidence at a crime scene and minimizing error.

DIVISION III :: ORAL PRESENTATIONS

More Than The Tuskegee Syphilis Study: A Piece to a Long Historical Puzzle of Medical Exploitation

Willie Terry

Faculty Sponsor: Jenny Barker-Devine

The Covid-19 vaccine caused an upward trend in public discourse around a historical event that exploited hundreds of African Americans in Tuskegee, Alabama: The Tuskegee Syphilis Study. The Tuskegee Syphilis Study was an experiment meant to examine the course of untreated syphilis in African American men. Today, the prevailing opinion in the media is that the Tuskegee Syphilis Study was the lone driver of medical mistrust among African Americans. However, my study asks: is this the only event of medical exploitation that has been done to African Americans, or is the Tuskegee Syphilis Study just one piece to a long Historical puzzle of medical exploitation of African Americans? Thus, by comparing the work of ethicist Harriet Washington with social science research, I find that by limiting our understanding of medical mistrust to just the Tuskegee Syphilis Study, we are missing a much more complex issue. African American experiences throughout time suggest that there is a long history of harmful practices that contribute to the uncertainty of African Americans towards the medical establishment, not just the Tuskegee Syphilis Study.

DIVISION III :: POSTERS

Antiracism in the Archives: Asian Students at MacMurray College During World War

Brandi VanMatre

Faculty Sponsor: Jaclyn Tabor

Throughout World War II (1939-1945), the United States implemented a number of draconian policies targeted at Asian-Americans; most famously, forced internment for those of Japanese descent. For these reasons, many colleges banned Asian students from attending. MacMurray College, however, was one of the few that actively recruited and embraced them. These actions seemed to provide a model for what it means to courageously support minority students, but to help us better understand how Asian American students were perceived and treated during WWII, at MacMurray and beyond, we dove into MacMurray's press clippings and yearbooks, as well as scholarly sources. We found that while MacMurray admitted and recruited Asian-American students during this time, their actions following the admission of these students fell short of being antiracist. Press releases, news clippings, and yearbook entries demonstrate frequent use of racist language, "yellow peril" sensationalism, model minority stereotypes, and tokenism. The frequent feature of these Asian-American students in MacMurray press/publications presented them as novelties or outsiders at the predominantly white college (PWI). While we hoped to find evidence that MacMurray College was in some way a prototypical model of antiracism in higher education, instead, we found that the college fell short in the same ways that contemporary PWIs do - in working to recruit, highlight, and make visible minority students - but doing little else to support/include them.

Libertarian Moral Psychology

Camille Lyons

Faculty Sponsor: Dane Wendell

Libertarians find themselves excluded from the grounds of liberals and conservatives where they are widely recognized, their parties are understood by the general public, and can be voted for in elections without the thought of a "wasted vote." This political group combines ideals from liberals and conservatives but they struggle to identify with one political side, which leads libertarians to swing vote between parties. This research works to understand why libertarians cannot firmly identify with either party- specifically how their moral psychology separates them from the majority. This is done by analyzing data from 11,994 self-identified libertarians with a focus on results from the moral foundation (MFT) questionnaire and big five personality inventory, and the interpersonal reactivity index (IRI) results will be the basis for understanding how libertarian's moral psychology compares to their liberal and conservative counterparts. The analysis found that the libertarian's moral psychology led them to identify with libertarians in the same ways that it guides one to identify as liberal or conservative. The inability to securely identify with a political party was shown in data where libertarians scored very differently in sensitivity to harm (MFT), low on agreeableness from big 5 personality inventory, and low on empathetic concern, personal distress, and disgust from IRI compared to the two majority parties. This furthers previous research on personality and morals being an indicator of political attitudes and demonstrates how these differences leave them as outsiders in politics. With the rise of libertarians in politics, research will be extended to understand the psychology of our voters and our ever-changing political grounds.

Is Intergenerational Farming Dead?

Collin White

Faculty Sponsor: Marilyn Markel

This work quantifies the hardships young farmers face trying to enter the agricultural industry. These hardships include a lack of working capital and insufficient land transition planning, which is especially difficult for younger farmers. This paper provides evidence of the struggles farmers consistently face across generations, as well as the unique hardships each generation faces. Using data from the Census of Agriculture (USDA National Agricultural Statistics Service, 2017), I examine tenure, ownership, and transition of land (TOTAL) by generation and along other demographic measures. From these results, I confirm the existence of these hardships and discuss if the next generation can "come back" to the farm. In addition, I explore how we can better support those returning to agriculture and potential new entrants by mitigating these struggles.

Inclusive and Accessible: Illinois College Student Organizations

Devin Nesler

Faculty Sponsor: Samantha Sauer

Illinois college even though a PWI the campus has had many different clubs on campus referencing those who are underrepresented on campus. Even though Illinois College is approaching its 200th year anniversary there is still little to nothing known about those clubs focused on the minorities/underrepresented peoples on campus. To find out more about these clubs we conducted archival "deep dives" into what various clubs on campus during 2 different time periods were doing. To explore the clubs' representation on campus, we combed through numerous campus publications, like the campus newspaper, the rambler, yearbooks, catalogs, and occasionally alumni quarterlies. From our research we learned what various clubs from vastly different time periods were doing like what events they did on campus, when they were active, and if found in the yearbook who was in the club. Overall, the goal of this research is to demonstrate that these clubs were here, the people they represent where and are still here.

Inclusive and Accessible: Illinois College Student Organizations

Monika Poudel

Faculty Sponsor: Samantha Sauer

"Inclusive and Accessible: Historic Student Organization Collections" began in 2020 with an effort to close gaps in Illinois College's history by making it more inclusive and being a voice for the underrepresented groups' histories. In an effort to close gaps in representation,we focused on researching events and weaving an organized story of different members and individuals of the Illinois College community, including but not limited to international students and the local chapter of Best Buddies. These records, stored in the Khalaf Al Habtoor Archives at Illinois College, were further explored, analyzed, and placed in a systematic format like google spreadsheets, docs, and drives. Each document tracked each individual's contribution to the project while also tracking where every source of information came from to make sure future researchers could verify it. Our research was funded by Stephen M. Tillery '72 Research Fund for Outstanding Students and the Dr. Malcolm Stewart and Mrs. Mary Flo Stewart Student Research Fund.

Hidden History: Memorials and Monuments on the Hilltop

Elise Griffin

Faculty Sponsor: Samantha Sauer

"Hidden History: Memorials and Monuments on the Hilltop" is a multi-year project that focuses on the many forms of Illinois College's forms of commemoration. This was the first year that this project was worked on so the focus was getting started on documenting the existing forms of commemoration. Updated photos of external building plaques were taken and uploaded to spreadsheets with hopes of the information becoming more accessible to the Jacksonville community and the College community as well. Deep dives were conducted on multiple buildings, Tanner Hall for example, to learn more about the different forms of commemoration on just one building. Commemoration is an important aspect of history and the main questions for this research were as follows: "Why is the campus commemorating this," "Who should be commemorated?" "Who should not be commemorated?" and "What and who should be commemorated in the future?"

A Different Kind of Family: Fayerweather House as a Domestic Space

Ren Parks

Faculty Sponsor: Jenny Barker-Devine

Illinois College is a unique institution for the pride we take in sharing our history, but it's difficult to do so in a way that both brings in public interest and stays true to documented reality. The most well-documented aspects of our institution's history are not easily marketable because they aren't grandiose stories of forceful triumph over oppressive hierarchies or narratives by Great Men who wage war for a noble cause – often, our institution's best-documented history takes place from the comfort of someone's living room. Hannah Fayerweather, namesake of Fayerweather House, wife of founding professor Julian Sturtevant, mother of six, student, and teacher, played a large role in our institution's history. After she moved into the newly constructed house in 1852, Hannah played a significant role in Illinois College's early development. Not only did she handle affairs in Sturtevant's frequent absences, but her domestic labor, along with that of the hired women of color under her employ, brought our college through its turbulent years of infancy. This project paints a picture of historic Fayerweather House as a lived-in and loved-in domestic space. Today, Fayerweather House is a predominantly LGBTQ+ residence. It's still a loving, domestic space, but it's home to a different kind of family. Hannah Fayerweather's story is a chance for Illinois College to hone in on its historical New England-Midwestern roots while still being inclusive and mindful of the hard history that

might encompass. It includes the Yale Band story we love so much, an impactful female story of triumph over adversity and subversion of traditional gender roles, a chance to lift up the stories of black and brown women in the domestic labor force whose stories are often untold, and an opportunity to discuss LGBTQ+ acceptance and community on campus.

S.L.U.M.P. Showcasing Leadership, Understanding and Motivating Performance in the Construction Industry

Sydney Geyston

Faculty Sponsor: Allison Burrus

In a survey conducted and published on Career Explorer, cement masons, truck drivers, and construction project managers were asked to rate their satisfaction in categories of salary, job meaning, personality fit, work environment, and skills utilized. These individual scores were then averaged to determine overall satisfaction. Cement mason's overall satisfaction rating scored 2.9 out of possible 5 points (58% satisfaction). Truck Drivers were rated at 2.7 out of 5 (54% satisfaction). Finally, Construction Project Managers had the highest satisfaction rating of 3 out of 5 points (60% satisfaction rating). These ratings are all very low, indicating a compelling need for the construction industry's human resource reform.This poster presentation reviews common leadership pitfalls in the construction industry that negatively impact employee job satisfaction (Metzger, 2022). In addition, this presentation will suggest several research-based techniques for managers and leaders of construction companies to address those pitfalls. In particular, these techniques will focus on job enrichment. According to Dubrin (2023), job enrichment refers to making the job more motivating and satisfying by adding variety, responsibility, and managerial decision-making. This gives employees a sense of ownership, responsibility, and accountability (p. 157). Ultimately, these techniques can be utilized to heighten the job satisfaction of their employees, which in turn should increase job performance. This presentation will emphasize the difference between having a job and loving a career. All employees should have the opportunity to turn their job into the career they love. It's the duty of management to provide those opportunities.

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