UNION UNIVERSITY

Fall Poster Session

November 14, 2023

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Fall Poster Session

TUESDAY, NOVEMBER 14, 2023

SUB Hallway | 11 a.m. –12:30 p.m.

Student Presenters

Art

Leah Steed | "John Singer Sargent: Maintaining a Reputation in the Arts"

Faith Orr | "Computers and Creativity: Where AI Meets the World of Art"

Anna Meadows | "The Evolution and Integration of Screen Printing into the World of Graphic Design"

Jenna Harbaugh | "Refining Fire – How the Heat of Kilns Change Glazes"

Shelby Rector | "Efficiency in the Studio: Applying 21st Century Technologies to Ceramic Surfacing Techniques"

Benjamin Van Neste | "The Evolution of Sport Design"

Rayann Moss | "Fritz Eichenberg: Carving Through Darkness"

Business

Micah McGee | "Ethic of Care in the Workplace"

Biology

Emerie Landers | "Using DNA Barcoding to Identify High Priority Taxa (Hymenoptera: Ichneumonidae) in Great Smoky Mountains National Park"

Kelsey Crowley | "Exploring Spider Wasp (Hymenoptera: Pompilidae) Diversity in Cypress Grove Nature Park"

Emily Sadler | "Biodiversity of Velvet Ants (Hymenoptera: Mutillidae) in Cypress Grove Nature Park"

D. Victoria Seymour | "The Gator Chomp: Investigating the Influence of Prey Mobility on Feeding Kinematics of *Alligator mississippiensis*"

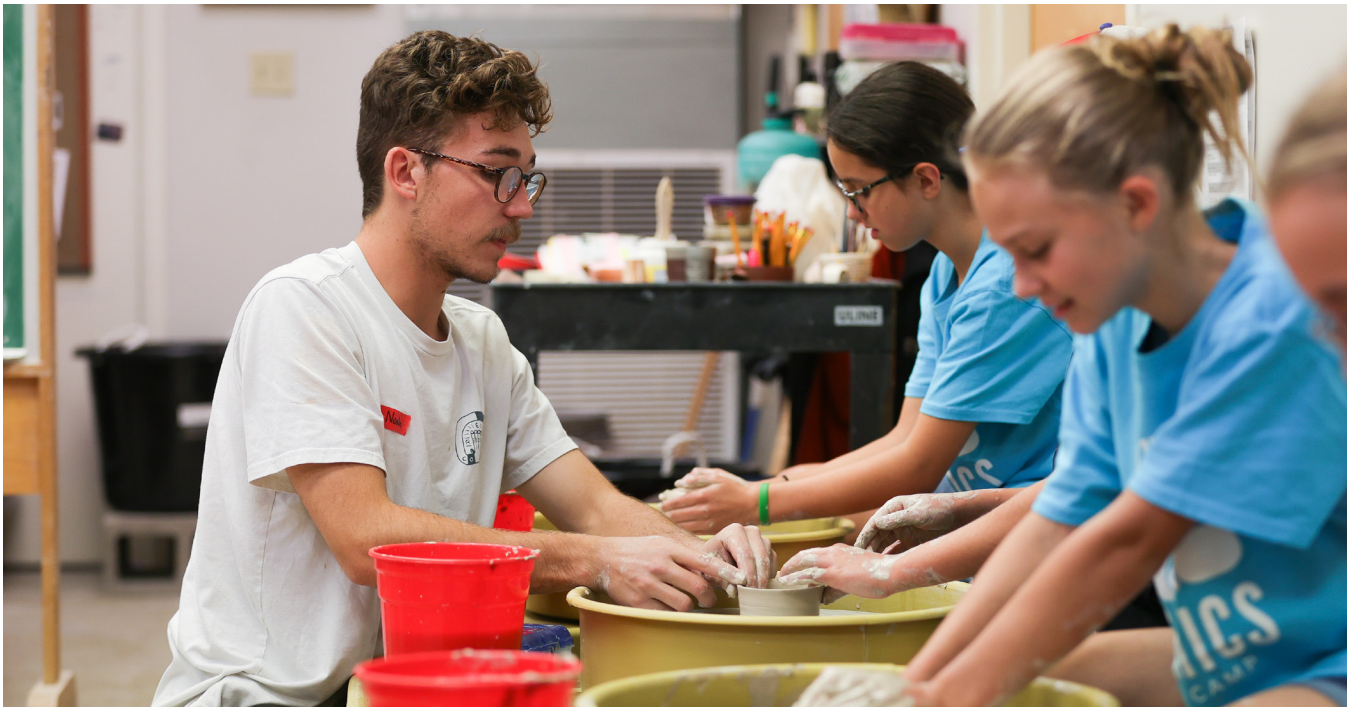
Abigail Donham | "The Effects of Urbanization on Mammalian Predators in Huntsville, Alabama"

Brayden Paulk | "Survey and Comparison of the Bird Species of a West Tennessee Wetland Mitigation Site and Bottomland Hardwood Forest"

Hannah Mitchell | "Analyzing the Immediate Physical Activity Response of Male Mice after Orchiectomy and Reintroduction of Testosterone"

Sally Howell | "Transcriptional Regulation of DIO-3"

ART



John Singer Sargent: Maintaining a Reputation in the Arts

Presenter: Leah Steed
Faculty Advisor: Haelim Allen

To gain recognition in the visual arts, one must have not only talent, but a drive and unique personality to promote oneself. Being articulate, cultured, and aware of contemporary trends and issues, are just some of the proficiencies needed to succeed. One must stand out just enough to attract attention, while simultaneously conforming to societal expectations. One example of this balancing act can be seen in the life of the painter, John Singer Sargent. He became a respected artist at a young age, but he was also a risk taker, which led to the scandalous portrait of *Madame X* (1884) and the decline of his reputation. However, he was able to regain popularity, ultimately becoming the leading portrait painter of his generation. Through examining Sargent's rise, fall, and dramatic recovery, we see how one artist navigated societal expectations in order to maintain and regain a favorable reputation in the arts.

Computers and Creativity: Where AI Meets the World of Art

Presenter: Faith Orr
Faculty Advisor: Haelim Allen

The use of Artificial Intelligence (AI) is rapidly emerging in various disciplines, including digital art, and professionals everywhere are forced to confront this technological revolution. AI is not a new tool in the world of digital art, but the rapid advancements in image generation have led to numerous legal issues. Instead of being used as a tool, AI image generators allow people to request art from text prompts, rather than through their own creative processes. The resulting work has led to various copyright dilemmas and poses a threat to current artists' livelihoods. Yet, with the establishment of proper laws, informed creators can keep their humanity at the core of their creative processes, while using AI as a tool to enhance rather than replace original creativity.

The Evolution and Integration of Screen Printing into the World of Graphic Design

Presenter: Anna Meadows
Faculty Advisor: Haelim Allen

Screenprinting, commonly known as silk screen printing, revolutionized mass-produced art for artists, designers, and industries in the early 20th century. This technique involves the transfer of ink onto a substrate through a mesh screen to create a design or pattern. In the 1960s, this process was further developed and modified to facilitate large scale manufacturing at textile printing shops. The gradual adoption of screenprinting as an art form impacted the artworld through the creation of iconic prints such as Andy Warhol's *Campbell's Soup Cans*. In the 21st century, it has slowly evolved into a common printing technique that is employed by graphic designers at production companies to produce vibrant print quality and long-lasting designs on items such as t-shirts, balloons, product labels, signs, and displays.

Refining Fire – How the Heat of Kilns Change Glazes

Presenter: Jenna Harbaugh
Faculty Advisor: Haelim Allen

Kiln firings can often seem mysterious, especially for those unfamiliar with ceramics. The firings are too hot to view with the human eye, so it can be difficult to see the processes that the pots undergo. A piece of pottery will go into the glaze kiln as a plain pot and come out covered in hard, colored glass. The key to this change occurs in the kiln itself – in the heat, which morphs the glaze into a different state entirely. The process can be observed by pausing the kiln through various stages of firing, firing glaze components separately, and by studying chemical reactions. The focus of this research will be on the melting process of the glazes in the kiln and how the heat of the kiln changes the glazes from dry powder to glass. Knowledge of the kiln firing processes can be used to control results in the glaze body itself, thus allowing a potter to adjust the sheen of the glaze, change possible glaze colors, or to give more control over the movement of the glaze as it melts.

Efficiency in the Studio: Applying 21st Century Technologies to Ceramic Surfacing Techniques

Presenter: Shelby Rector
Faculty Advisor: Haelim Allen

For thousands of years, ceramic artists have utilized a variety of techniques such as resists to create unique surfaces for their pieces. Even though they are steeped in tradition, artists have begun utilizing new technology to update their studio practices. The purpose of this research is to discuss how combining resists, transfers, and textures with 21st century technologies like die-cutting machines and 3-D printers have created more efficient ways for potters and ceramicists to create a multitude of unique surface designs. Pairing the die-cutting machine with resist techniques lets artists create and cut their designs without using scissors or an X-acto knife. Ceramic decal printers eliminate the need to hand paint a design and transfer the image onto the pot. A 3-D printer can be used to create any shape or texture imaginable that can be impressed or added to the surface as opposed to hand carving or molding. All of these examples show how artists can utilize technology and maximize their studio practices.

The Evolution of Sport Design

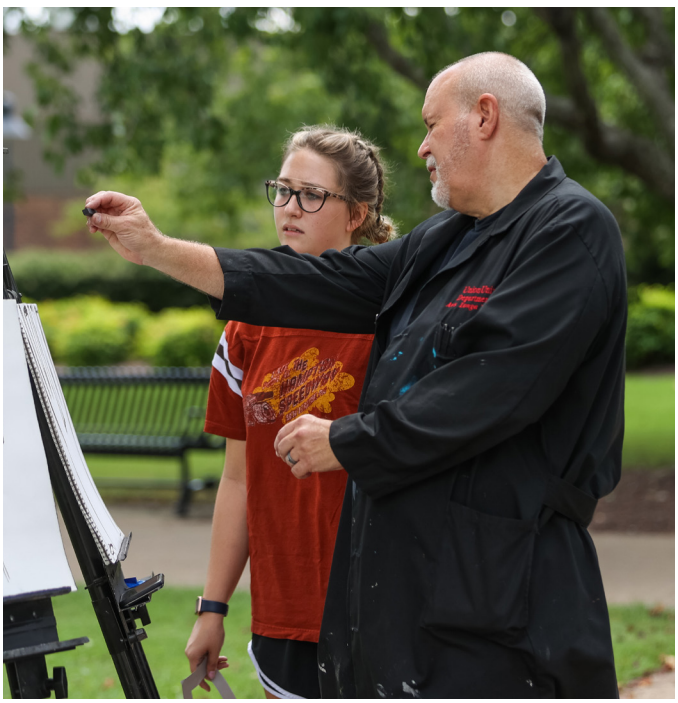
Presenter: Benjamin Van Neste
Faculty Advisor: Haelim Allen

In the 90's sport design, specifically logos and uniforms, used to be visually energetic to grab the attention of viewers and capture the essence of the sport. Bright vibrant colors with complex designed logos were key for most sports teams and organizations. For example, the Detroit Pistons logo, using bright red, yellow, and teal, depicted a horse and flaming mufflers, with the pistons name running across the graphic. The logo was a great way to reference Detroit's rich history and its role as the birthplace of many automotive companies while still conveying the energy of the sport. However, recent sports logos have moved away from complex design to more minimal and sleeker choices for teams and organizations. Not only have the logos evolved, but also the uniforms, colors and overall branding. Sports design changed to enhance marketability and profitability by simplifying logos and designs in order to follow with the trend in the design industry, where clarity and simplicity resonates better with consumers.

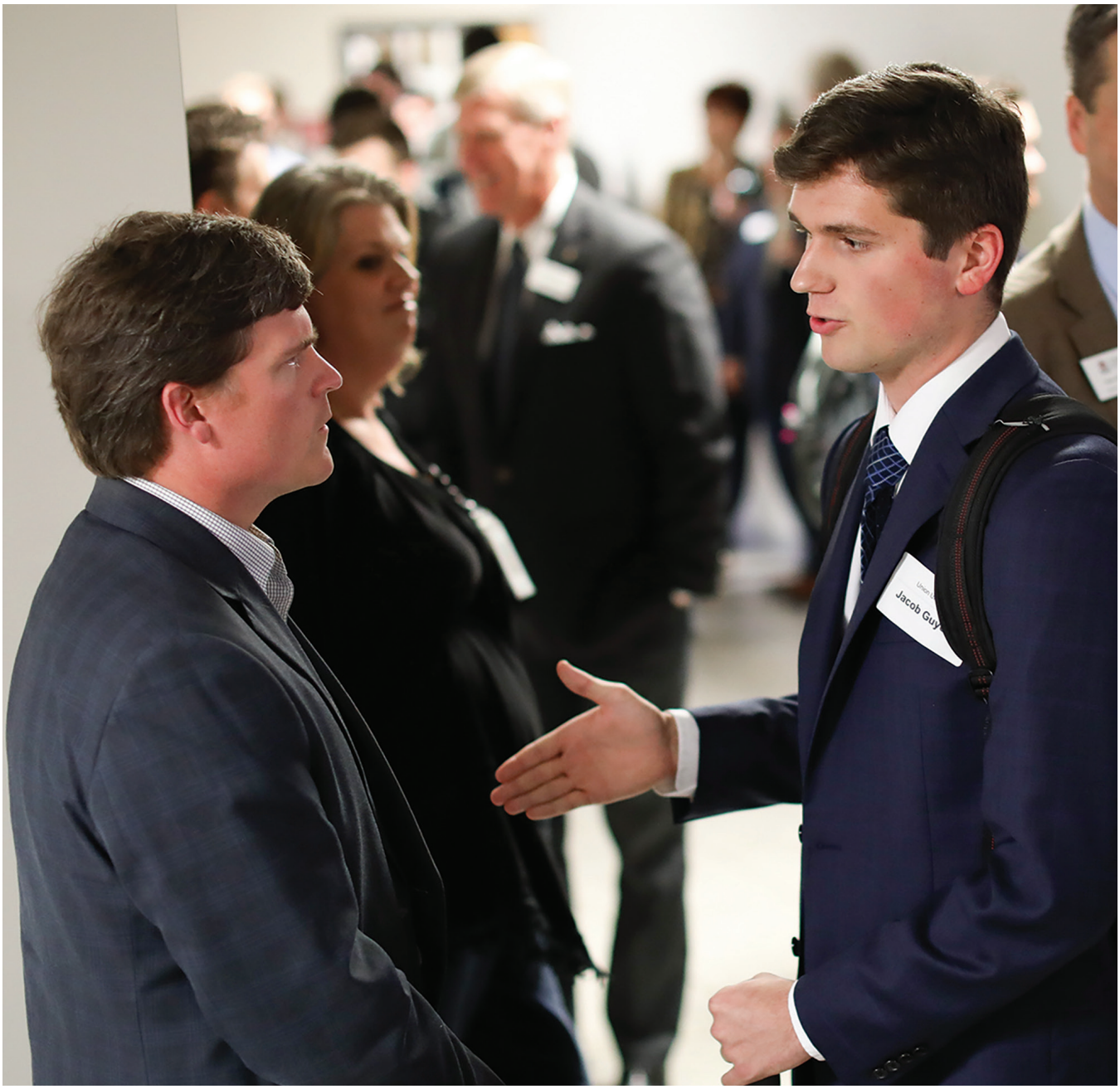
Fritz Eichenberg: Carving Through Darkness

Presenter: Rayann Moss
Faculty Advisor: Haelim Allen

Fritz Eichenberg (1901-1990) was a German-American illustrator and graphic artist who grew up in Cologne, Germany. Due to living through both World War I and World War II, he was no stranger to suffering and strife. Yet he held firmly to the belief that there was redemption from suffering. Fritz Eichenberg imbued that belief into his illustrations through the medium of *woodblocks*, carving into the dark inked wood, bringing light into the world of his design. From book illustration, to political cartoons, to religious imagery and more, his works held similar themes of the struggle between dark and light. Even in the *Dance of Death*, his most morbid series, Eichenberg hoped to redeem such horrors through narrative illustration and humor. Eichenberg's faith shines through his *Dance of Death*, using the high-contrast medium of woodblock prints and his expert narrative illustration to shed light on the darkest troubles of humanity during the 20th century.



BUSINESS



Ethic of Care in the Workplace

Presenter: Micah McGee
Faculty Advisor: April Rowsey

This project seeks to develop a more thorough understanding of the practice and process of caring as a means of reducing the challenges of employee fatigue, burnout, reduced work anxiety, and turnover, while exploring care/caring contributions to organizational commitment, resilience, enhanced grit, and psychological safety. It further examines how theory and practice from the discipline of nursing can contribute to a more robust understanding (through both conceptualization and operationalization) of the caring construct in the work environment and, thus, promote positive outcomes in the workplace. This study tests a model operationalizing care as a workplace-specific measure, using established scales from nursing literature, analyzes care as a multi-dimensional construct, and in doing so makes several contributions to scholarly literature. Additionally, understanding the impact of managerial care behaviors on employee's perceptions/subjective experience of feeling cared for, and related workplace outcomes, is a positive step for promoting human flourishing in organizations.

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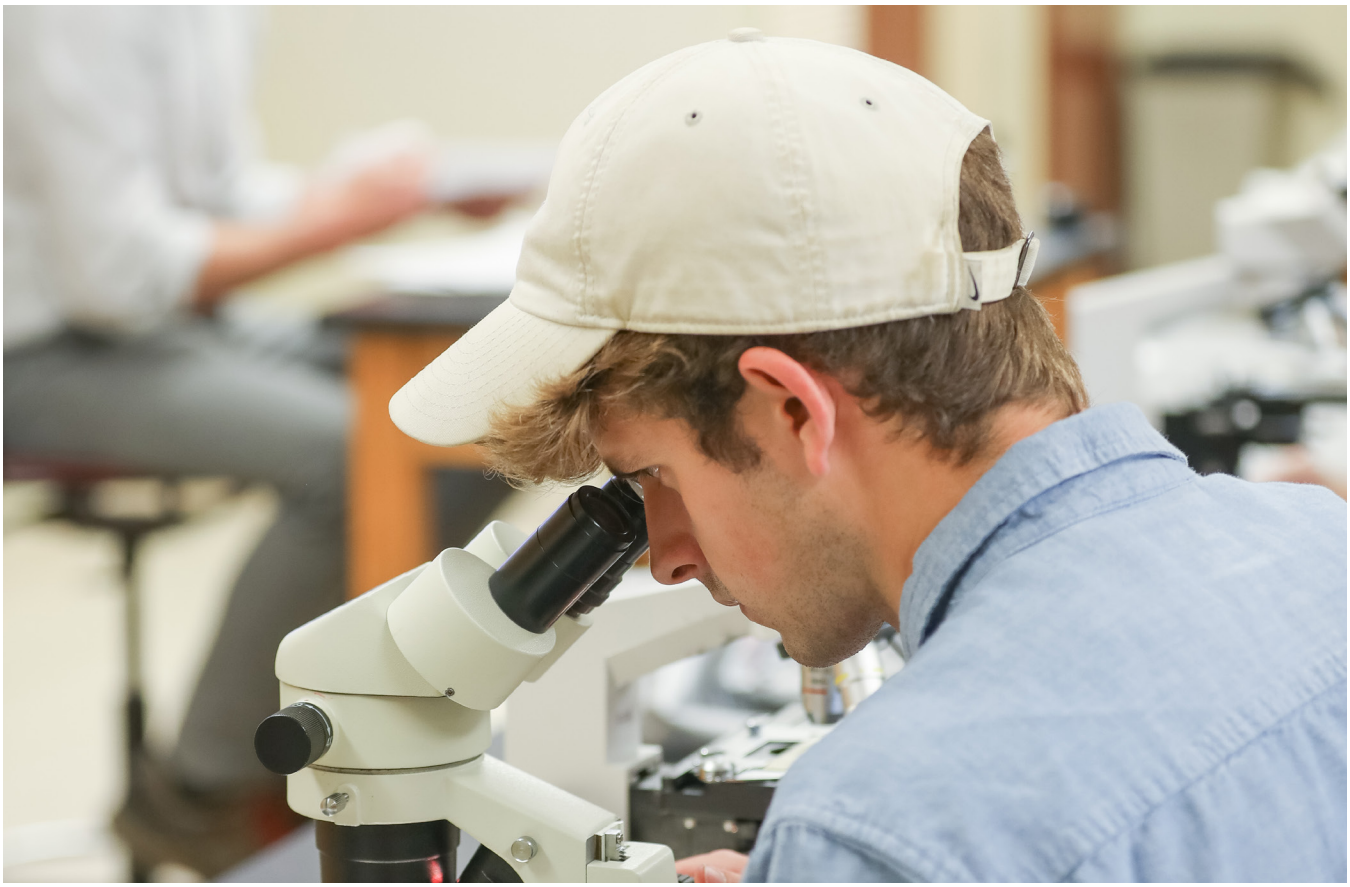

Using DNA Barcoding to Identify High Priority Taxa (Hymenoptera: Ichneumonidae) in Great Smoky Mountains National Park

Presenter: Emerie Landers
Faculty Advisor: Jeremy Blaschke

The parasitoid wasp family Ichneumonidae comprises one of the largest and most diverse groups of animals in the world. Despite the positive, multifaceted effects parasitoids like ichneumonids have on their environment, they are extremely understudied. Biodiversity inventories, especially when focused on unique environments like those found in Great Smoky Mountains National Park (GSMNP), can provide invaluable data about understudied groups like Ichneumonidae. DNA barcoding has recently transformed biodiversity surveys by making species identification more efficient and accurate. To begin surveying the diversity of Ichneumonidae at GSMNP, thousands of previously collected ichneumonids were sorted to morphospecies and 95 representatives were selected for DNA barcoding. Of these, 30 specimens represented genera or species that had not been previously observed in GSMNP and therefore represent new park records for Ichneumonidae. These results demonstrate a promising future for using DNA barcoding to identify new records of understudied taxa at GSMNP.

Exploring Spider Wasp (Hymenoptera: Pompilidae) Diversity in Cypress Grove Nature Park

Presenter: Kelsey Crowley
Faculty Advisor: Jeremy Blaschke

To survey the diversity of spider wasps (pompilidae) at Cypress Grove Nature Park (Jackson, TN), Malaise and pan traps were used to collect insects which were then sorted to Order, Family, and morphospecies. Representative specimens of each pompilid morphospecies were sent to the Canadian Centre for DNA Barcoding for genetic analysis. A total of 56 pompilids representing 29 morphospecies were collected. Of these, 19 were positively identified based on >98% genetic similarity to pompilids within the Barcode of Life Database (BOLD) with confirmed species IDs. This survey was the first attempt to document pompilid diversity in CGNP and revealed 4 new genera and 6 new species, highlighting the importance of future research in pompilid systematics and the promise of future discoveries. This study emphasizes the need for additional high-quality species identifications coupled with genetic analyses in databases like BOLD to help future researchers identify species of understudied groups like pompilidae.

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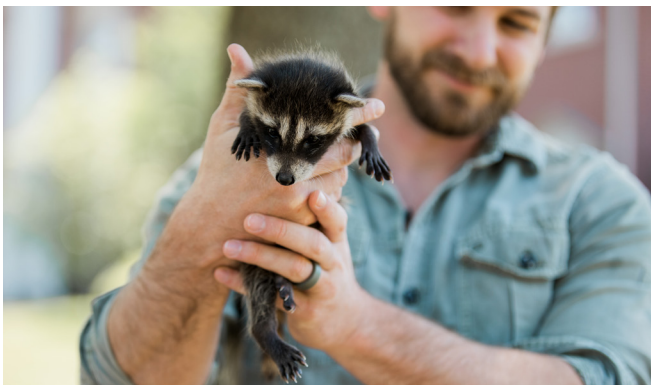


Biodiversity of Velvet Ants (Hymenoptera: Mutillidae) in Cypress Grove Nature Park

Presenter: Emily Sadler
Faculty Advisor: Jeremy Blaschke

Velvet ants (Hymenoptera: Mutillidae) are parasitoid wasps known for their defense mechanisms and aposematic coloration. Mutillidae includes 4,300 described species with worldwide distribution, but little is known about their biology and systematics. To survey the biodiversity of velvet ants in a unique environment, insects were collected in Malaise traps in Cypress Grove Nature Park (Jackson, TN) from Aug. 5–Oct. 24, 2020 and Aug. 11– Sep. 6, 2022. Specimens were sorted to genus and morphospecies. Specimens from each morphospecies were sent to the Canadian Center for DNA Barcoding for genetic analysis. A total of 42 mutillids were collected, representing six genera and 20 morphospecies. No specimens were able to be matched genetically with known species within the Barcode of Life Data System, which underscores the importance of integrating morphological identifications with DNA barcoding for future researchers. All six genera discovered represent new park records for Cypress Grove Nature Park.

The Gator Chomp: Investigating the Influence of Prey Mobility on Feeding Kinematics of *Alligator mississippiensis*

Presenter: D. Victoria Seymour
Faculty Advisor: James Kerfoot

American alligators (*Alligator mississippiensis*) are apex, opportunistic predators. To survive, they capture both mobile and immobile prey. Little is known about how mobile versus immobile prey influences their feeding performance. This study sought to investigate the modulation in feeding kinematic behavior when feeding on mobile versus immobile prey. Six captive individuals were fed both mobile and immobile fish prey (treatments groups) and feeding events were recorded using a high-speed video camera between April and August 2023. Feeding performance was summarized by analyzing 4 kinematic feeding variables (maximum gape, duration of feeding event, approach velocity, maximum gape velocity). Results showed that none of the kinematic variables were significantly different between treatment groups and indicated that American alligators do not modulate their feeding behavior based on the mobility of the prey. Here, American alligators seem to utilize a static or constant form of prey capture behavior regarding the prey's mobility underwater.

The Effects of Urbanization on Mammalian Predators in Huntsville, Alabama

Presenter: Abigail Donham
Faculty Advisor: Andy Madison

Urbanization has impacted wildlife populations, but its effect on predator populations in Huntsville, AL, has not been examined. Camera traps were set up from mid-February to mid-May 2023 in 4 randomly selected suburban sites in the Huntsville area and 4 randomly selected sites on the Wheeler National Wildlife Refuge (which were considered rural sites). There were 2 cameras for each site, set ~30 m apart. The traps were checked periodically to ensure function and to collect data from SD cards in the cameras. A total of 15 different species were observed in the suburban sites and 11 in the rural sites. The most common independently observed species was white-tailed deer (*Odocoileus virginianus*) with 155 total observed in rural sites and 38 total observed in the suburban sites. Five total coyotes (*Canis latrans*) were observed and only 1 fox (*Urocyon cinereoargenteus* or *Vulpes vulpes*), which were the only predators photographed.

Survey and Comparison of the Bird Species of a West Tennessee Wetland Mitigation Site and Bottomland Hardwood Forest

Presenter: Brayden Paulk
Faculty Advisor: Andy Madison

Wetlands have declined significantly in North America since European settlement, which has harmed bird populations dependent on them for habitat. My research objective was to compare the bird species composition of 2 sites in Rossville, Tennessee near Memphis: the Rossville Wetland Mitigation site and a nearby bottomland hardwood forest preserve. A wetland mitigation site creates a new wetland to offset the destruction of wetland habitat elsewhere. Line transects were walked in the springs of 2022 and 2023, and the species and number of each species were recorded along with other relevant data such as sex, age, and weather conditions. Results showed that the Mitigation site had a species richness 17.6% higher than the hardwood forest site and was used primarily by grassland and wetland species. The hardwood forest was used primarily by forest interior species, especially those associated with mesic forests or swamps.

Analyzing the Immediate Physical Activity Response of Male Mice after Orchiectomy and Reintroduction of Testosterone

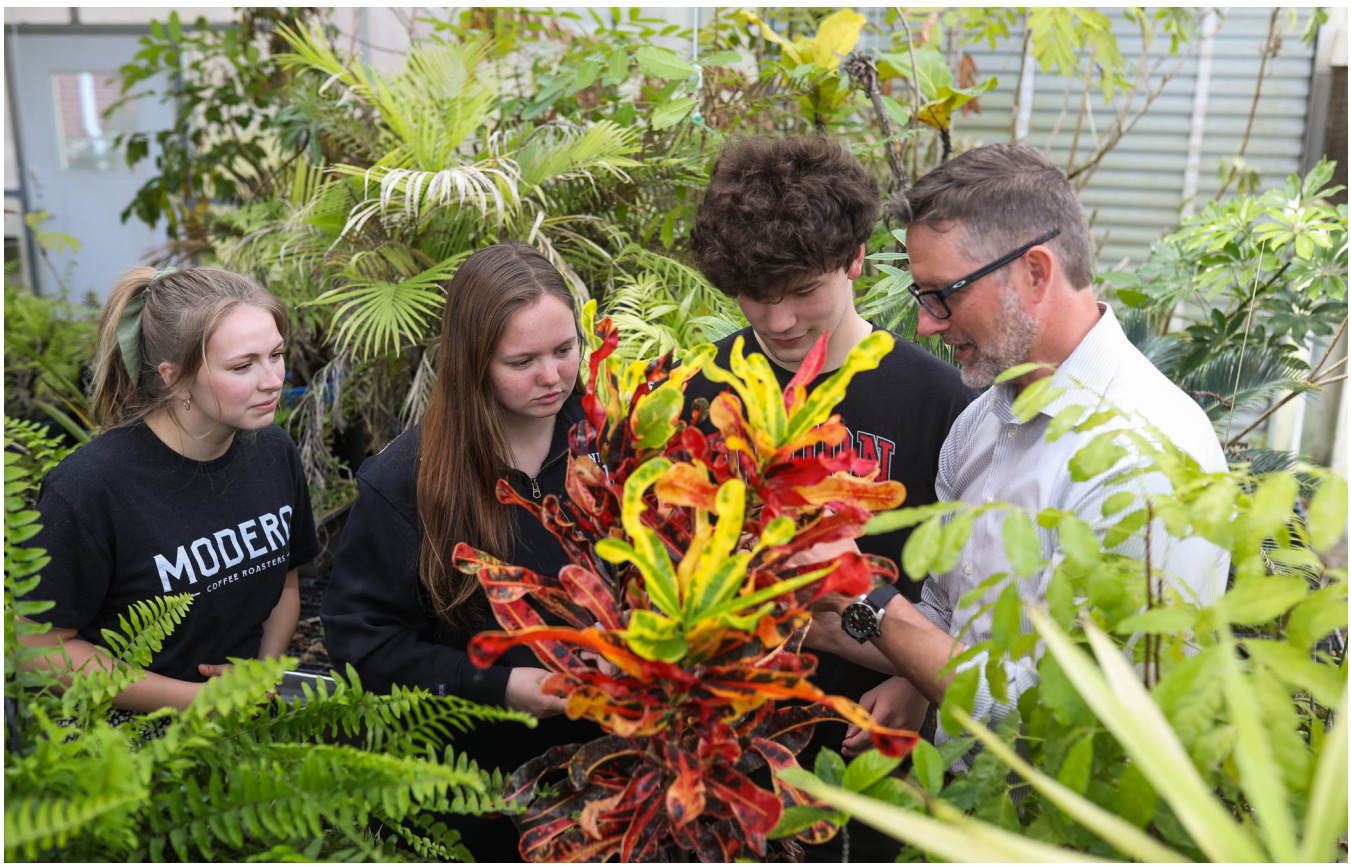
Presenter: Hannah Mitchell
Faculty Advisor: Robert Bowen

Analyzing the immediate physical activity response of male mice after orchiectomy and reintroduction of testosterone is important because it has been postulated that testosterone is a physical activity regulator in both rodents and humans. Most people don't meet their daily physical activity recommendations, which may be due to testosterone deficiency. The purpose of this research was to evaluate the time course (rapid or slow) by which physical activity reinvigoration occurs immediately following the reintroduction of testosterone to surgically-disrupted, testosterone-deficient mice. Wheel running speed [$F(14,28) = 1.14$, $p = 0.372$] was unaffected by exposure to testosterone. Wheel running distance [$F(14,28) = 30.91$, $p = 0.001$] and duration [$F(14,28) = 27.86$, $p = 0.001$] were affected by exposure to testosterone. While testosterone-deficiency significantly reduced wheel running distance and duration, both variables recovered to baseline immediately after testosterone reintroduction. Testosterone appears to recover wheel running vigor immediately following re-exposure.

Transcriptional Regulation of DIO-3

Presenter: Sally Howell
Faculty Advisor: William Thierfelder

Nearly 300,000 new people face breast cancer each year, and more than 10% die. This research used a breast cancer cell line to examine whether the expression of the enzyme deiodinase-3 (DIO-3) correlates with breast cancer migration and metastasis. Cells that had undergone CRISPR gene editing were tested to determine any carried deletions in DIO-3. Several clones were found that carried the deletions in DIO-3. A scratch test was performed to determine whether the cells carrying the deletion migrated differently than unmodified cells. Preliminary results suggest that deletion of DIO-3 correlates with a reduction in migration. Since DIO-3 inactivates thyroid hormone (T3), these data suggest that T3 in the cell medium supports cell migration.



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