

# Posters at the Capitol 2026

## Presented by LaURA

(Louisiana Undergraduate Research Association)



### Greetings:

The Louisiana Undergraduate Research Association (LaURA) is a nonprofit organization that promotes and supports undergraduate research participation in faculty-mentored research and creative projects. The membership comprises Louisiana public and private college and university faculty, administrators, and staff as well as industry leaders who support the high-impact practice of undergraduate research. LaURA's purpose is to unite faculty, staff, administrators, and industry professionals across campuses and disciplines to advocate for access and opportunity for all undergraduate students in Louisiana. Providing more students with the opportunity to participate in this high-impact educational practice. Today, we celebrate our student's products. We celebrate curiosity, dedication, and passion for discovery and data based decision making. Research is about more than seeking answers; it's about asking multiple questions and being open to the experiences of the answers to those questions. Through this process, students gain skills that will serve them far beyond their academic journey—critical thinking, innovation, resilience, and creativity, will serve them forever.

### Program Contents:

1. Contact for LaURA at each participating institution
2. Poster Presentation Schedule
3. Student Presenter's information and abstracts

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## Poster Presentation Schedule:

<b>Time</b>	<b>Activity</b>	<b>Location</b>
8:00 - 8:30 am	Set Up Posters	Rotunda
8:30 - 9:00 am	Registration	Rotunda
9:00 - 10:00 am	Poster Session A	Rotunda
10:00 - 11:00 am	Poster Session B	Rotunda
11:00 - 11:15 am	Group Photo	Capital Front Steps
11:15 am - 1:00 pm	Lunch	Louisiana Purchase Room Claiborne Building
1:00-2:00 pm	Poster Session C	Rotunda
2:00-3:00 pm	Poster Session D	Rotunda
3:00 - 4:00 pm	Closing Remarks	
4:00 - 4:30 pm	Break Down Posters	Rotunda



## Session A: 9:00 to 10:00 am

Poster #	Table #	Presenter's Name	Poster Title	Institution
1	1	Brittany Tate	App development for data validation of scientific collection processes in the Louisiana Freshwater Sponge Project	Baton Rouge Community College
2	1	Jesse Mehaffey	Utilizing spicules in sediment samples to further define species richness of Freshwater Sponge populations in Louisiana	Baton Rouge Community College
3	2	Mallory Rhymer	The Role of Pneumatic Layer Thickness in Gemmule Gemmosclere Formation	Baton Rouge Community College
4	2	Michael Reulet	The Louisiana Freshwater Sponge Project: a comprehensive analysis of the freshwater sponge population and its shift in species richness	Baton Rouge Community College
5	3	Christen Woods	Oncolytic Virus-Based Screening Reveals Novel Lactam-Fused Halolactones and Epoxide-Tethered Lactam-Carboxamides as Potent Anti-Breast and Skin Cancer Agents	[LBNR] Southern University and A&M College
6	3	Devesh Sarda	Automatic Cognitive Classification for Alzheimer's Disease using 3D Modeling of fMRIs	[LBNR] Louisiana State University, Shreveport
7	4	Brooke Horridge	SID-1, a Key Protein Involved in Systemic RNAi, Functions as a Pro-viral Factor in <i>C. elegans</i>	[LBNR] University of New Orleans
8	4	Taylor Burket	Role of histone modifications in antigenic variation in <i>Giardia lamblia</i>	[LBNR] University of Louisiana at Monroe
9	5	Ahnaf Chowdhury	A Multimodal Vision-Language AI System for Accurate Identification of Invasive Insect Species in Louisiana	LSU A&M
10	5	Alexis Bourgeois	Pregnancy health management apps: A cross-sectional market research study on preferences among Louisiana women	LSU A&M
11	6	Calley Chauvin	Mitochondrial Uncoupling Protects Against Cancer-Associated Skeletal Muscle Dysfunction	LSU A&M
12	6	Dillon Ditt	Aerobic Treatment Units: An Overlooked Source of Anthropogenic Water Contamination	LSU A&M
13	7	Emilia Lomnicki	Influx of illicit and controlled drugs during the Super Bowl and Mardi Gras in New Orleans, Louisiana	LSU A&M
14	7	Lucille Yoes	Investigating Benthic Communities amongst the Northern Gulf of America's Hypoxic Dead Zone	LSU A&M
15	8	Rebekah-Ann Slocum	Put a Hat on It: Investigating the Origins of Tomte Glitches in LIGO Detectors	LSU A&M
16	8	Samantha Murillo	Development of Atmospheric Plasma Spray Durable Coatings	LSU A&M
17	9	Sophia Klosowski	Exploring Pre-Nursing Students' Learning in an Introductory General Chemistry Course	LSU A&M



## Session B: 10:00 to 11:00 am

Poster #	Table #	Presenter's Name	Poster Title	Institution
18	1	Amber Seal	A Taste of Independence: Effects of Child-Led Sensory Exploration on Vegetable Intake	Nicholls State University
19	1	Blaise Kleibert	Detection of virulence genes by PCR in clinical isolates of Staphylococcus aureus from a tertiary hospital in southern Louisiana	Nicholls State University
20	2	Emily Davis	Early Biomarkers of Environmental Stress in Louisiana Crayfish	Nicholls State University
21	2	Mia Crooks	Clementine Hunter's Insight Into Modernism	Nicholls State University
22	3	Michelle Beals	Energy Trade-off in Common Musk Turtles Based on Incubation Temperatures	Nicholls State University
23	3	Paige Zeringue	How Different Temperatures Affect Apple Snail Life History Strategies	Nicholls State University
24	4	Trista Bonvillain	Investigating Physical Interactions between Oil and Vibrio vulnificus	Nicholls State University
25	4	Tristan Nilsson	Biodegradation of Trimethoprim, a common antimicrobial, by a Bacterial consortium enriched from Thibodaux Sewage Treatment Plant	Nicholls State University
26	5	Christian Bristow	Social Determinants of Cardiovascular Health: A State-Level Comparison Between Louisiana and Minnesota	University of Louisiana at Lafayette
27	5	Emma Thomas	200 Years of Chess in New Orleans	University of Louisiana at Lafayette
28	6	Jacques Laughlin	Childhood Maltreatment, Trauma, and Working Memory	University of Louisiana at Lafayette
29	6	Katilyn, Kemper	Evaluating Flood Exposure and Resilience of Public Buildings in Coastal Louisiana	University of Louisiana at Lafayette
30	7	Leah Notto	Site-specific elastic biomechanical properties of articular cartilage degraded with MMPs representing different stages of osteoarthritis	University of Louisiana at Lafayette
31	7	Olivia, Good	Development of targeted ML/AI tools to detect cancer in ultrasound images	University of Louisiana at Lafayette
32	8	Chandler Johnson	Creating Safe Spaces for Anxious and Introverted Piano Students	University of Louisiana at Lafayette
33	8	Jayda Bullard	Staging the Unspeakable: A Costume Design Solution for Bloodless Violence in Big Love	University of Louisiana at Lafayette
34	9	Sydnee Johnson	The Ripple Effect: Causes and Effects of University Noncompliance Found in Financial Audits	University of Louisiana at Lafayette
35	9	Darshan Kumar	Cajun Advanced Picosatellite Experiment (CAPE)	University of Louisiana Lafayette
36	10	Lana Gaspard	Recreating Heatwaves: How extreme temperatures impact maternal provisioning and future evolution	University of Louisiana Lafayette



## Session C: 1:00 to 2:00 pm

Poster #	Table #	Presenter's Name	Poster Title	Institution
37	1	Emiliana Grove	Multifunctional, liquid metal embedded soft materials towards seals with embedded electronics for space applications	LaSPACE (Louisiana State University and A&M College)
38	1	John Kiritsis	Measuring Artificial Gravity During Suborbital Rocket Flight	LaSPACE (Louisiana State University and A&M College)
39	2	Skye Strain	Explainability of Unsupervised Machine Learning Methods for High-Energy Astrophysics	LaSPACE (Louisiana State University and A&M College)
40	2	Corinne Lansing	Antioxidant Potential of Rosemary Leaf-Derived Nanovesicles	LaSPACE (Louisiana State University and A&M College)
41	3	Nour, Abdelmageed	Exploring Mechanical Properties of 3D Printed Resin for Aerospace Applications	LaSPACE (Southeastern Louisiana University)
42	3	Riley Guillory	Fabrication Strategies for Conductive Hydrogel-Based Wearable Sensors	LaSPACE (University of Louisiana at Lafayette)
43	4	Susannah Donoghue	Stak 'Em - A Rocket Science Educational Kit for K-12 and Beyond	LaSPACE (University of Louisiana at Lafayette)
44	5	Alyssa Pace	Functional Communication	Louisiana Tech University
45	5	James D Poole	Poster Title: Arsenic Sensing by Carbon Quantum Dots Synthesized in Hydrothermal Conditions	Louisiana Tech University
46	6	Kate Montgomery	Detection of Brown Spot Needle Blight in Loblolly Pine Using Sentinel-2 Data	Louisiana Tech University
47	6	Mags C	Vista Rock Island Greenway Collaboration	Louisiana Tech University
48	7	Aidan Hidalgo	Arthrobacter phage "BenchScraper" is similar to Cluster AY phages with few minute distinctions	Southeastern Louisiana University
49	7	Brenna Stamper	An Artist's Contribution to Neuroaesthetics	Southeastern Louisiana University
50	8	Carrington Wynn	Bias and Ethical Implications of AI-Based Hiring Systems	Southeastern Louisiana University
51	8	Hannah Costner	The Influence of TikTok and Social Media Persuasion Techniques on Consumptive Patterns and Practices	Southeastern Louisiana University
52	9	Dwight Williams Jr.	A Firm Foundation	Southeastern Louisiana University
53	9	Avery Hearnberger	Genomic and Experimental Analysis of Bacteriophage Characteristics	Southeastern Louisiana University



## Session D: 2:00 to 3:00 pm

Poster #	Table #	Presenter's Name	Poster Title	Institution
54	1	Layla Thomas	Tire-Derived 1,3-Dicyclohexylurea Impairs Photosynthesis and Growth in the Aquatic Macrophyte <i>Lemna minor</i>	Southern University
55	2	Carey Hutchison	Philosophy as an Asset to the State: Exploring the Benefit of Critical Thinking Experts as Added Perspectives in Aiding Analysis	The University of New Orleans
56	2	Eian Bailey	Staying on Track: Commuter Rail in Southeast Louisiana	The University of New Orleans
57	3	Gabriel Malone	Designing Safe, Emotionally Responsive Game-Based AI Agents with Persistent Memory for Children's Social-Emotional Learning	The University of New Orleans
58	3	Jude Case	Dynamics of Barrier Island Dune Sediments at Caminada Headlands and Chandeleur Islands and a Cross-Comparison of Mastersizer 3000 and Camsizer 3D Sediment Analysis Instruments	The University of New Orleans
59	4	Naadia Guidry	An Environmental approach to the Climate Crisis	The University of New Orleans
60	4	Oscar Cabezas	A Novel Hybrid Deep Learning Technique for Speech Emotion Detection	The University of New Orleans
61	5	Valeria Alarcon	Stimulation of Left and Right Frontal Language Areas in Children with Autism Spectrum Disorder.	The University of New Orleans
62	6	Anna Keller	Development and Characterization of a novel 3D spheroid system to model metastasis	Loyola University New Orleans
63	6	Ella Yerger	Determination of the Molecular Basis for Erythromycin Resistance Methyltransferase Selectivity through Bioinformatics	Loyola University New Orleans
64	7	George Cattan	Teaching Undergraduates Toxicology Skills Via a Mock Urinalysis LC-MS/MS Protocol	Loyola University New Orleans
65	7	Izabella Stutz-Lazzara	Properties study for systematically modified UV-activated solid-state switches	Loyola University New Orleans
66	8	Margaret Woods-Crawford	Know Cancer to No Cancer-Empowering Youth Through Cancer Literacy; a school-university partnership initiative in the Greater New Orleans Area	Loyola University New Orleans
67	8	Mirialys Diaz-Robles	Chondroprotective functions of NR4A2 in osteoarthritis	Loyola University New Orleans
68	9	Taylin Naquin	An expanded evaluation of XRD and SEM-EDS for the characterization of inorganic particles in eyeshadows	Loyola University New Orleans
69	9	Mitchelle Okoli	Temperature-Specific Specialization in Extremophilic Molecular Machines	Loyola University New Orleans



## Poster Information and Abstracts

**Poster Number/Table:** 1/1

**Poster Presentation Time:** 9-10am

**Poster Title:** App development for data validation of scientific collection processes in the Louisiana Freshwater Sponge Project

**Student Presenter:** Brittany Tate

**Institution:** Baton Rouge Community College

**Faculty Mentor:** Mary G. Miller

### Abstract:

The goal of this project is to advocate for research labs to understand the importance of accurate data collection and encourage more interdisciplinary collaboration with computer science students interested in programming and data science. The project focuses on a foundational part of research, data. Data tells stories in “data language” that data scientists interpret and translate. The Louisiana Freshwater Sponge Project was established in 2019 to monitor the freshwater sponge populations in and around Louisiana. The project has collected data from over 400 sites including Louisiana, Texas, and Arkansas. As the project continues to expand, a more streamlined approach is needed to address the accumulation of data. This project aims to investigate ways to create and implement an application/program and database from existing data and ensure new data are accurate. This was accomplished using Python, and graphical user interfaces (GUI) Tkinter and Kivy, to supplement the programming skills acquired at the undergraduate level. This research showed that there are ways to ensure data validation and address large datasets using undergraduate level material and independent research on professional level programs/software (Python, Tkinter, Power BI, MySQL, Visual Studio). The biggest obstacles to the completion of the project were debugging, choosing the correct GUI for the intended OS and cleaning the data in preparation for migration to the database. Data stored in multiple formats are still being migrated into the main database and will continue until completed. The Python program has been repackaged to an android application and ready for user acceptance testing (UAT).



**Poster Number/Table:** 2/1

**Poster Presentation Time:** 9-10am

**Poster Title:** Utilizing spicules in sediment samples to further define species richness of Freshwater Sponge populations in Louisiana

**Student Presenter:** Jesse Mehaffey

**Co-Authors:** Geremiah Perkins and Destiny Marvel

**Institution:** Baton Rouge Community College

**Faculty Mentor:** Mary G. Miller

**Abstract:**

The Louisiana Freshwater Sponge Project (LFSP) is a longitudinal study designed to document the diversity of freshwater sponges across the state. The study compares the current sponge populations with those reported by Micheal Poirrier in 1969. Sponge specimens are identified through morphological analysis of spicules present in the sponge body and/or gemmules, supplemented by COI and ITS gene sequencing for molecular confirmation. This research examines the utility of isolating and identifying spicules in sediment to further define species richness within Louisiana. Fifty sites throughout Louisiana were analyzed using a modified version of Lukowiak's protocol for marine sponges. A total of 500 grams of sediment was collected from multiple points at each site. It was then dried and processed through a series of chemical treatments to eliminate both organic and inorganic materials, isolating silica-based particles, including sponge spicules. These particles were subsequently examined using light microscopy. In the absence of live specimens, sediment analysis can provide morphological evidence of sponge presence, indicating a higher species richness than is documented solely through specimen collection. This approach not only corroborates the presence of observed live sponges but also extends the documented species richness at many sites. Sediment analysis thus represents a valuable tool for comprehensive biodiversity assessments. It enables verification of species presence in the absence of observable sponge bodies and mitigates limitations associated with seasonal sampling constraints.



**Poster Number/Table:** 3/2

**Poster Presentation Time:** 9-10am

**Poster Title:** The Role of Pneumatic Layer Thickness in Gemmule Gemmosclere Formation

**Student Presenter:** Mallory Rhymer

**Co-Authors:** Abigail Curl, Tran Vi, Loc Nguyen

**Institution:** Baton Rouge Community College

**Faculty Mentor:** Mary G. Miller

**Abstract:**

Freshwater sponges are filter-feeding organisms that shape our water systems by filtering out bacteria and other small particles. *Ephydatia fluviatilis* is a species of freshwater sponge that is found in a wide range of brackish and freshwater habitats. This species, like other freshwater sponges, form dormant gemmules that are covered with spicules. But this species has been observed to have malformed spicules. Very little is known about the composition of gemmules; there is a pneumatic layer, which is a protective layer that varies in thickness. There may be a correlation between the thickness of the pneumatic layer and the spicule malformations found in *Ephydatia fluviatilis* in sites with a presence of heavy metals. A malformation grading scale has been developed to quantify the severity of each spicule, ranging from grade zero, having no malformations, to grade three, being unrecognizable. Using a light microscope, one hundred spicules were counted, individually graded, and recorded. Ten gemmules are gathered and cut in half, and undergo a preserving a drying procedure to be ready for scanning electron microscopy. During SEM measurements, data are collected and then compared to the presence of malformations in each sponge sample. After observing these data, there is no clear relationship between the presence of malformations and the thickness of the pneumatic layer. While gathering data from SEM, visual observations were made of differences in the composition of the pneumatic layer; whether this is a result of spicule malformation is unknown. One limitation of our research is the limited data set, in the future more samples of *Ephydatia fluviatilis* will be collected and compared to reach a conclusion. Based on the findings of this study, a deeper investigation can begin to explore the relationship between gemmules and survival under adverse water conditions. Changes to the procedure will be implemented to gather more consistent and accurate data.



**Poster Number/Table:** 4/2

**Poster Presentation Time:** 9-10am

**Poster Title:** The Louisiana Freshwater Sponge Project: a comprehensive analysis of the freshwater sponge population and its shift in species richness

**Student Presenter:** Michael Reulet

**Co-Authors:** Maireann Dawes and Kenzie Cooke

**Institution:** Baton Rouge Community College

**Faculty Mentor:** Mary G. Miller

**Abstract:**

The diverse range of Louisiana water systems provides myriad habitats for freshwater sponges. However, the last documented survey of freshwater sponges was over 50 years ago. Since then, Louisiana's freshwater systems have undergone deterioration in water quality, habitat loss through saltwater intrusion, and habitat creation through river diversions and flood control measures. In 2019, the Louisiana Freshwater Sponge Project was established to provide community college students with invaluable hands-on research experience. This longitudinal project has trained 50 undergraduates as they compare the species richness between the past and present ecological studies. At each survey site, substrates are retrieved and examined. When sponges are observed, sponge body and gemmules (if present) are collected. Water is collected for water quality analysis, and sediment is collected for spicule analysis. Sponges are identified via spicule morphology, or either COI or ITS sequencing. To date, 315 sites in Louisiana have been surveyed with 65% having sponges present. Species richness at sites ranges from 0 to 6 species (mean = 1.2). As with the previous study, *Eunapius fragilis* and *Trochospongilla horrida* are still the most abundant. This study documents shifts in Louisiana's freshwater populations and now questions the recording of new species. Over the 2,000 sponge samples collected, numerous malformations have been recorded which could indicate some novel species but demonstrate no significant differences in gene sequences. This prompts the re-evaluation of current taxonomic methods of freshwater sponges and emphasizes the importance of exploring additional genetic markers for novel species.



**Poster Number/Table:** 5/3

**Poster Presentation Time:** 9-10am

**Poster Title:** Oncolytic Virus-Based Screening Reveals Novel Lactam-Fused Halolactones and Epoxide-Tethered Lactam-Carboxamides as Potent Anti-Breast and Skin Cancer Agents

**Student Presenter:** Christen Woods

**Institution:** [LBNR] Southern University and A&M College

**Faculty Mentor:** Jean Chamcheu

**Abstract:**

Oncolytic virotherapy has emerged as a promising modality in cancer treatment, with therapeutic efficacy frequently enhanced by natural and synthetic chemotype scaffolds capable of modulating viral replication, tumor selectivity, and host-tumor interactions. Despite this potential, the combinatorial anticancer and viro-modulatory effects of multifunctional small-molecule scaffolds used in conjunction with oncolytic viruses remain insufficiently underexplored. Here, we report the design, synthesis, and biological evaluation of 38 functionalised lactams, comprising lactam-fused halolactones and epoxide-tethered lactam carboxamides (LH-ELC). These compounds were assessed for dual antitumor and antiviral potentiation using engineered herpes simplex virus type 1 (HSV-1) variants (VC2 and VC2-GMCSF) in triple-negative breast cancer (MDA-MB-231) and melanoma (SK-MEL-28) cell lines. Structure-based design, computational modeling, and cytotoxicity profiling identified three lead candidates, W23, W35, and W38. These lead compounds exhibited dose-dependent cytotoxicity against SK-Mel-28 cells ( $IC_{50} = 17.8, 28.7, \text{ and } 52.9 \mu\text{M}$ , respectively) and MDA-MB-231 cells ( $IC_{50} = 21.6, 40.5, \text{ and } 42.1 \mu\text{M}$ ). Notably, all three compounds significantly reduced intracellular reactive oxygen species in breast cancer cells by 35%, 32%, 35%, respectively. In parallel, LH-ELC derivatives demonstrated moderate antiviral activity, inhibiting VC2 viral attachment and reducing plaque-forming units in cancer cell lines ( $IC_{50} = 27\text{-}67 \mu\text{M}$ ), suggesting their capacity to modulate viral entry and enhance oncolytic efficacy. Mechanistically, none of the lead compounds inhibited p70S6K isoforms; however, W38 selectively inhibited soluble epoxide hydrolase, indicating a distinct and therapeutically relevant mode of action. Physicochemical profiling revealed moderate aqueous solubility for W23 and W35, while W38 exhibited high solubility and lipophilicity, supporting favorable drug-development properties.



**Poster Number/Table:** 6/3

**Poster Presentation Time:** 9-10am

**Poster Title:** Automatic Cognitive Classification for Alzheimer's Disease using 3D Modeling of fMRIs

**Student Presenter:** Devesh Sarda

**Institution:** [LBNR] Louisiana State University, Shreveport

**Faculty Mentor:** Subhajit Chakrabarty

**Abstract:**

Introduction: People with Alzheimer's Disease (AD) have been proven to have reduced memory and cognitive levels currently, doctors utilize various techniques to classify a patient with AD. In past work involving deep learning, 2D modeling has mostly been used with fMRI classification. This is possibly due to lack of adequate models/libraries in this domain. Objective: This study aims to utilize fMRIs to train 3D models to accurately classify the differing levels of AD. Methods: Our dataset will be using ADNI and OASIS fMRIs to determine the three levels of cognitive normal (CN), mild cognitive impairment (MCI), and AD. From the ADNI dataset, we used 450 patients each having a fMRI for their diagnosis, and 100 patients from OASIS. We believe that deep learning (DL) models can help in the process of identifying the cognizant levels of a person based on the MRI. We used ResNet-50, ResNet-100, MobileNet, VGG-16, and ViT perform a multi-class classification. However, we developed the 3D version of these models for which standard models/libraries do not exist, which is our scientific contribution in this work. Results: Our results indicate high model accuracy in the multi-class classification of the brain fMRIs on the AD scale. Our best model achieved an accuracy of 84% on the test dataset. Significance: The 3D model was able to effectively predict the cognitive level of AD based on just the fMRI of a patient. The significance of this work is to help neurosurgeons and neurological doctors hasten their timeliness of the diagnosis and prognosis using brain fMRIs to determine and help patients with cognitive disabilities due to AD.



**Poster Number/Table:** 7/4

**Poster Presentation Time:** 9-10am

**Poster Title:** SID-1, a Key Protein Involved in Systemic RNAi, Functions as a Pro-viral Factor in *C. elegans*

**Student Presenter:** Brooke Horridge

**Institution:** [LBNR] University of New Orleans

**Faculty Mentor:** Rui Lu

**Abstract:**

RNA interference (RNAi) provides a strong antiviral defense pathway for fungi, plants, and invertebrates. In plants and insects this defense mechanism involves a systemic signal originating from infected cells. The signal can travel to neighboring unexposed cells, establishing an antiviral state ahead of the virus's arrival. Previous research has demonstrated that plant viruses proficient in suppressing the production or export of this systemic signal exhibit enhanced survival compared to viruses lacking such capabilities. RNAi in *Caenorhabditis elegans* nematodes also features such a systemic silencing signal. Currently, whether this systemic silencing signal contributes to antiviral defense in nematodes remains largely unknown. This study aims to address this knowledge gap through a series of genetic and biochemical analyses. Specifically, we investigated the contribution of a *C. elegans* gene named *sid-1* to antiviral RNAi. This examination utilized worm mutants proficient in mounting a robust RNAi response, while concurrently supporting heightened viral replication. We found that *sid-1* is required for high level viral replication in mutants capable of mounting an RNAi response but becomes dispensable in mutants defective in RNAi. *sid-1* encodes a transmembrane domain and a dsRNA binding domain. These observations together with the fact that overexpression of human genes encoding dsRNA binding domains can effectively suppress antiviral RNAi suggest that *sid-1* acts as a pro-viral factor by suppressing antiviral RNAi in *C. elegans*.



**Poster Number/Table:** 8/4

**Poster Presentation Time:** 9-10am

**Poster Title:** Role of histone modifications in antigenic variation in *Giardia lamblia*

**Student Presenter:** Taylor Burket

**Co-Authors:** Srinivas Garlapati, Brandon David, Lorien Helm, Kade Malone

**Institution:** [LBNR] University of Louisiana at Monroe

**Faculty Mentor:** Srinivas Garlapati

**Abstract:**

*Giardia lamblia*, a flagellated protozoan parasite, is the causative agent of giardiasis in humans and is responsible for major waterborne outbreaks of diarrhea in the United States. *Giardia* parasites display antigenic variation that allows them to evade mammalian host's adaptive immune response, leading to chronic and sometimes recurrent infections in patients. How *Giardia* parasites switch their surface antigens is not clearly understood. Preliminary observations using Histone Deacetylase (HDAC) inhibitors suggest that the epigenetic mechanism is involved in antigen switching. To validate that HDAC inhibitors are targeting histone modifying enzymes, NAD-independent and NAD-dependent histone deacetylases, in *Giardia*, the genes will be cloned, expressed and purified from *E. coli* cells. The recombinant enzymes will be tested for their ability to acetylate histones in *in vitro* assays in the presence and in the absence of HDAC inhibitors.



**Poster Number/Table:** 9/5

**Poster Presentation Time:** 9-10am

**Poster Title:** A Multimodal Vision-Language AI System for Accurate Identification of Invasive Insect Species in Louisiana

**Student Presenter:** Ahnaf Chowdhury

**Institution:** LSU A&M

**Faculty Mentor:** Ivan Grijalva

**Abstract:**

Invasive and emerging insect species present a growing challenge to agricultural production in Louisiana, where rapid identification is essential for timely and appropriate management. Many farmers and citizens lack immediate access to taxonomy expertise, and existing automated identification tools often provide overconfident predictions without accounting for uncertainty, increasing the risk of misidentification and unnecessary pesticide use. To address this gap, we develop a vision-language decision support system designed for farmers and citizens facing insect identification and guidance. A convolutional neural network classifier was fine-tuned on images of 50 agriculturally relevant insect species, including multiple invasive, pest, and beneficial insects commonly found in Louisiana cropping systems. The model achieved 92.7% test accuracy and showed consistent performance across all insect species, including less common classes, as indicated by macro-averaged precision, recall, and F1-scores above 92%. To reduce the risk of incorrect recommendations, predictions are filtered using validation-derived SoftMax confidence and predictive entropy thresholds, allowing the system to withhold advice when uncertainty is high. For confident predictions, curated extension-style species descriptions are retrieved and provided as context to a language model, which generates clear, natural-language responses to farmer-citizen questions regarding identification, risk, and management considerations. This research demonstrates how computer vision combined with retrieval-augmented language models can support AI-assisted insect species identification for Louisiana agriculture.



**Poster Number/Table:** 10/5

**Poster Presentation Time:** 9-10am

**Poster Title:** Pregnancy health management apps: A cross-sectional market research study on preferences among Louisiana women

**Student Presenter:** Alexis Bourgeois

**Co-Authors:** Priyanka Chaudhary, Renee A. Underwood, Melissa Martin, Kara Denstel, Leanna Redman, Amanda E. Staiano

**Institution:** LSU A&M

**Faculty Mentor:** Amanda Staiano

**Abstract:**

**Background:** Pregnancy is a critical life stage that requires comprehensive health management. Mobile health (mHealth) apps offer accessible support for prenatal and postpartum care, yet behavioral factors and preferences influencing their adoption remain unclear. This market research study aims to describe confidence, awareness, important health priorities, preferred features, and willingness to download or pay for pregnancy health management apps among women in Louisiana. The primary outcome was the likelihood of downloading an app.

**Methods:** A cross-sectional, web-based market survey was conducted by MESH LLC (Baton Rouge, LA) in March-April 2025 among 597 women in Louisiana via the Alchemer platform. Eligible respondents identified as women residing in Louisiana and had children under 21 years of age or had no children but were pregnant or hoped to be pregnant in the future. Respondents completed a 10-minute structured survey comprising six domains: (1) sociodemographic and pregnancy characteristics, (2) confidence in maintaining a healthy pregnancy weight, (3) awareness of pregnancy health apps, (4) perceived importance of pregnancy-related health topics, (5) preferred app features, and (6) willingness to download or pay for a pregnancy health management app. The survey included multiple-choice, Likert-scale, and ranking items. Data were analyzed using descriptive statistics, chi-square tests, and multivariable logistic regression in SPSS statistical software version 29.

**Results:** Respondents were predominantly aged 31-40 years (43.2%), married (60.1%), and college educated (34.3%). Most women (56.1%) reported household income below \$75,000. Over 80% expressed likelihood of downloading a pregnancy app, favoring a one-time fee for full access (27.8%) or a free version (20.9%). About 38% of respondents were aware of at least one pregnancy health app, with the most recognized being Pregnancy & Baby Tracker (37.5%) and BabyCenter (35.3%). Managing stress and mental health (mean = 8.36/10), along with understanding safe foods during pregnancy (mean = 8.21/10), ranked as the most important health priorities. Postpartum support (65.8%), kick counters (55.1%), and bump trackers (54.6%) were the most desired app features. Higher education (AOR = 2.27, p = 0.03), income  $\geq$  \$75,000 (AOR = 2.85, p = 0.005), and planning pregnancy (AOR = 3.63, p = 0.006) significantly predicted the likelihood of using an app for pregnancy health management.

**Conclusion:** Women in Louisiana demonstrated a high interest in downloading pregnancy health management apps, with a desire for mental health, nutrition, and postpartum support. Socioeconomic status and pregnancy influenced the likelihood of using an app, emphasizing the need for culturally tailored, affordable, and evidence-based mHealth solutions. These insights can help guide the development of digital interventions to advance maternal health management during pregnancy and postpartum in underserved regions.



**Poster Number/Table:** 11/6

**Poster Presentation Time:** 9-10am

**Poster Title:** Mitochondrial Uncoupling Protects Against Cancer-Associated Skeletal Muscle Dysfunction

**Student Presenter:** Calley Chauvin

**Co-Authors:** Analisa L. Taylor, Elizabeth R. M. Zunica, Christopher L. Axelrod, John P. Kirwan

**Institution:** LSU A&M

**Faculty Mentor:** John Kirwan

**Abstract:**

Cancer-associated muscle wasting remains a major contributor to morbidity and reduced quality of life, with limited options for therapeutic intervention. We have previously shown that the mitochondrial protonophore, BAM15, limits cancer growth oncogenic potential in cells and mice. The purpose of this study was to evaluate whether BAM15 restricts muscle wasting in a murine model of aggressive mammary cancer. Female C57BL/6J mice were fed a standard chow diet for 28 days before undergoing a mammary engraftment from EO771 cells for 14 days. Following, animals were randomized to control (Ctrl) or BAM15 treatment. Maximal grip strength, body composition, tumor burden, weekly food intake, and 10-day energy expenditure were subsequently assessed. In parallel, C2C12 myoblasts were differentiated for five days in high glucose DMEM supplemented with 1% horse serum. Cells were collected and lysates were blotted for myosin heavy chain (MHC) and lysyl oxidase-like 2 (LOXL2) expression. BAM15 treatment preserved lean and skeletal muscle mass while improving muscle function. Untargeted skeletal muscle transcriptomics analyses revealed changes in molecular pathways regulating muscle fibril organization and collagen deposition, suggesting extracellular matrix and skeletal muscle remodeling. LOXL2, one of the most significantly downregulated extracellular matrix genes, was post-translationally modified upon differentiation of C2C12 myoblasts into mature myocytes. Taken together, these data support that mitochondrial uncoupling preserves lean mass in mice with aggressive mammary cancer. Improvements in lean mass may be attributable to extracellular matrix remodeling mediated by LOXL2. Future studies will focus on the role and regulation of LOXL2 in the maturation and turnover of skeletal muscle.



**Poster Number/Table:** 12/6

**Poster Presentation Time:** 9-10am

**Poster Title:** Aerobic Treatment Units: An Overlooked Source of Anthropogenic Water Contamination

**Student Presenter:** Dillon Ditt

**Institution:** LSU A&M

**Faculty Mentor:** Aaron Bivins

**Abstract:**

Aerobic treatment units (ATUs) are widely used in rural and suburban areas of Louisiana where centralized municipal wastewater treatment is unavailable. These decentralized systems are intended to treat household wastewater before it is released into the environment. However, it is estimated that approximately 280,000 ATUs operate in coastal Louisiana, with up to two-thirds not meeting the performance requirements. Despite legislation requiring homeowner maintenance, enforcement at this scale is nearly impossible, leaving the extent of water contamination largely unknown. ATU effluent may contain various pollutants, including nitrogen, phosphorus, chemical residues, and microbial contaminants such as *Escherichia coli*, Enterococci, and human pathogens. To assess the potential impact, we collected water samples from ATU discharge pipes, roadside ditches, and receiving rivers in Calcasieu Parish. Nutrient, chemical, and microbial analyses of ATU samples were conducted using Quanti-Tray Most Probable Number (MPN) methods and standard chemical assays (Hach TNT kits). Additionally, biochemical oxygen demand (BOD) was measured and compared to Louisiana regulations. River and ditch samples were extracted with membrane filtration, followed by digital polymerase chain reaction (dPCR) analysis to detect HF183/BacR287, a human-specific genetic marker for domestic sewage contamination. Our results suggest poorly functioning ATUs could be a widespread and significant source of water quality contamination in coastal waters, underscoring the need for improved maintenance and public awareness to mitigate prevalent water contamination with human sewage.



**Poster Number/Table:** 13/7

**Poster Presentation Time:** 9-10am

**Poster Title:** Influx of illicit and controlled drugs during the Super Bowl and Mardi Gras in New Orleans, Louisiana

**Student Presenter:** Emilia Lomnicki

**Co-Authors:** Ramesh Sapkota, Anna Mathews, Alexis Cole, Bikram Subedi

**Institution:** LSU A&M

**Faculty Mentor:** Bikram Subedi

**Abstract:**

The national overdose crisis in the United States has reached record high deaths over the past ten years, of which Louisiana has one of the highest drug-related mortality rates in the country. These national and statewide deaths are largely attributed to stimulants and opioids, such as methamphetamine, cocaine, and fentanyl, and their co-use. Polysubstance use has currently been on the rise, heavily contributing to the national overdose deaths due to its unpredictable composition and their impacts. Wastewater-based epidemiology (WBE) is a comprehensive, near real-time, non-invasive analytical technique used to quantify concentrations of substances in wastewater to estimate evidence-based use of substances. This approach was used to quantify concentration of illicit drugs consumed during the Super Bowl and Mardi Gras, two of the most anticipated events in New Orleans in 2025. Twenty-three drugs, including psychostimulants (cocaine, methamphetamine, amphetamine, methylphenidate), fentanyl, prescription opioids (tramadol, hydromorphone, oxycodone, hydrocodone, codeine), medications for opioid overdoses (methadone, naloxone, buprenorphine), xylazine, and THC, were analyzed and quantified. The average concentration of the cocaine metabolite ( $2390 \pm 510$  ng/L) was predominantly higher and followed by methamphetamine ( $460 \pm 44.4$  ng/L). The cocaine use during Mardi Gras ( $1220 \pm 389$  g/d) was significantly higher than a typical week, but not statically different than during the Super Bowl ( $p= 0.128$ ). However, fentanyl use after Mardi Gras ( $4.43 \pm 1.50$  g/d) was significantly higher than during the Mardi Gras week ( $p= 0.015$ ).



**Poster Number/Table:** 14/7

**Poster Presentation Time:** 9-10am

**Poster Title:** Investigating Benthic Communities amongst the Northern Gulf of America's Hypoxic Dead Zone

**Student Presenter:** Lucille Yoes

**Co-Authors:** Cassandra Glaspie, Abby Roche

**Institution:** LSU A&M

**Faculty Mentor:** Cassandra Glaspie

**Abstract:**

The benthic zone serves as a crucial indicator of how ecosystems respond to environmental changes, especially in hypoxic areas such as the Gulf of Mexico's Dead Zone. Building on foundational research by Dr. Nancy Rabalais in the 1980s, this study reports on three years of sampling aboard the R/V Pelican to investigate how varying dissolved oxygen levels influence benthic communities. Fifty-four sediment core samples were gathered from six targeted stations along the Gulf of Mexico's Dead Zone, covering a range of oxygen conditions. Water parameters were measured with a CTD probe, and sediment cores were collected using a 0.1 m<sup>2</sup> box core, with three replicates at each station.

More than 500 individual invertebrates were identified across more than 30 species in the 2022 and 2023 sampling years, revealing clear patterns in species richness linked to oxygen availability. Areas with higher oxygen levels supported greater species richness, while severe hypoxia corresponded with reduced species diversity. When compared to similar surveys from the 1980s, the results show notable changes in benthic community composition over the past forty years. Identification and analysis of samples collected in 2024 will further reveal trends in species composition and strengthen the understanding of long-term ecological changes. These findings emphasize the ecological impacts of sustained hypoxia and highlight the importance of ongoing monitoring to guide conservation efforts.



**Poster Number/Table:** 15/8

**Poster Presentation Time:** 9-10am

**Poster Title:** Put a Hat on It: Investigating the Origins of Tomte Glitches in LIGO Detectors

**Student Presenter:** Rebekah-Ann Slocum

**Institution:** LSU A&M

**Faculty Mentor:** Gabriela González

**Abstract:**

The data from the Laser Interferometer Gravitational Wave Observatory (LIGO) is frequently disrupted by transient noise of both known and unknown origins, which are referred to as glitches. Glitches can obscure astrophysical signals, making the search for gravitational waves more challenging. In this work, we investigate the behavior of a specific glitch class, known as ‘tomtes’, during LIGO’s two most recent observing runs (O3 and O4) in the effort to search for possible origins.



**Poster Number/Table:** 16/8

**Poster Presentation Time:** 9-10am

**Poster Title:** Development of Atmospheric Plasma Spray Durable Coatings

**Student Presenter:** Samantha Murillo

**Co-Authors:** Vipul Jain, Austin Knight, Aranya Paul, Abigal Peck, Christopher Marvel

**Institution:** LSU A&M

**Faculty Mentor:** Christopher Marvel

**Abstract:**

Southeast Louisiana has a strong industrial economy that depends on steel infrastructure. However, our hot and humid environment introduces degradation issues that compromise the lifetime of steel components. This research aims to help extend the lifetime of steel pipes by developing durable coatings that enhance wear, corrosion, and oxidation resistance of engineering components exposed to harsh service environments. The research objective is to optimize and establish processing-structure-property relationships of high-performance WC-CoCr coatings that are deposited via atmospheric plasma spraying (APS). The study analyzes the influence of primary and secondary plasma gas flow rates, specifically argon and hydrogen, on key coating characteristics, including particle temperature and velocity, splat behavior, porosity, and phase composition. Characterization techniques such as Scanning Electron Microscopy, X-Ray Diffraction, Energy Dispersive X-ray Spectroscopy, and Transmission Electron Microscopy are employed to correlate process parameters with microstructural features and mechanical performance. Results indicate that a balance between plasma temperature and particle velocity is essential to minimize porosity while preserving desirable carbide phases, with optimal coatings achieved at 120 SCFH Ar and 5 SCFH H<sub>2</sub>. The steps are to install a robotic system to facilitate internal lining deposition of WC-CoCr coatings in steel pipes followed by in-field performance testing assisted by industrial partners. Overall, this work advances the processing-structure-property relationships in APS coatings and supports their scalability for industrial use.



**Poster Number/Table:** 17/9

**Poster Presentation Time:** 9-10am

**Poster Title:** Exploring Pre-Nursing Students' Learning in an Introductory General Chemistry Course

**Student Presenter:** Sophia Klosowski

**Co-Authors:** Tamera Jones, Supuni Dhameera Silva, Christen Jones, Ly Ngo, and Zakiya Wilson-Kennedy

**Institution:** LSU A&M

**Faculty Mentor:** Zakiya Wilson-Kennedy

**Abstract:**

Medicine, healthcare, and biomedical sciences are central to advancing treatments and innovations that improve societal well-being, and the growing demand for healthcare professionals in the United States highlights the importance of strong educational pathways. However, undergraduate students entering introductory science courses often face significant challenges as they adjust to the rigor of college-level coursework. This study investigates how pre-nursing students reflect on their learning experiences in an introductory general chemistry course. An open-response survey was administered to 102 pre-nursing students enrolled in general chemistry during spring 2025 to examine study habits, perceived challenges, use of learning resources, and shifts in academic expectations. The survey was distributed prior to the final exam to encourage reflection on students' overall learning experiences. Data were analyzed using an interpretive qualitative approach that combined inductive and deductive coding, constant comparative analysis, and thematic analysis, with Bandura's self-regulation theory informing the analytical framework. This approach allowed for examination of students' reflection, metacognitive awareness, and self-regulated learning practices across diverse demographic backgrounds. Preliminary findings illustrate how pre-nursing students define learning and how these definitions influence their approaches to studying general chemistry, offering insight into students' experiences and highlighting opportunities to improve instructional strategies tailored to this population. Implications include supporting student learning, informing curriculum development, and addressing challenges encountered in rigorous academic environments. Ultimately, this study contributes foundational knowledge aimed at better preparing future healthcare professionals by strengthening academic skills, self-regulation, and readiness for advanced nursing education.



**Poster Number/Table:** 18/1

**Poster Presentation Time:** 10-11am

**Poster Title:** A Taste of Independence: Effects of Child-Led Sensory Exploration on Vegetable Intake

**Student Presenter:** Amber Seal

**Co-Authors:** Allison Gaubert

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Brigett Scott and Allison Gaubert

**Abstract:**

Vegetable intake among children in the United States is staggeringly low. Countering this issue is particularly important in preschool age children, whose dietary patterns are being developed for their futures. Some studies suggest that encouraging food intake amongst children can be accomplished through nutrition education and sensory exposure. Despite this, research to determine whether these techniques have applications for vegetables of varied textures in preschool age children is lacking. For this study, two rounds of data collection will take place amongst 3–4-year-old participants, each round focusing on a different textured vegetable. Data collection utilizing pre-and-post intervention analysis is expected to demonstrate if student-led discussions and sensory exploration increases the acceptance of selected vegetables. We expect our results to provide further insight into the applications of sensory food exploration in childcare settings for enhancing overall diet quality.



**Poster Number/Table:** 19/1

**Poster Presentation Time:** 10-11am

**Poster Title:** Detection of virulence genes by PCR in clinical isolates of *Staphylococcus aureus* from a tertiary hospital in southern Louisiana

**Student Presenter:** Blaise Kleibert

**Co-Authors:** Rajkumar Nathaniel, Josh Bergeron, Myra Berthiaume, Hollie Devoltz, Anthony Battaglia, Jace Morvant, Landon Aucoin, Avery Guidry

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Brigett Scott and Allison Gaubert

**Abstract:**

*Staphylococcus aureus*, a potentially pathogenic gram-positive bacterium, causes infectious diseases and postoperative complications. *S.aureus* has virulence genes that promote its ability to establish itself and cause pathogenicity in its host. Resistance to  $\beta$ -lactams in methicillin-resistant *S.aureus* (MRSA) is acquired by the transmission of a mobile genetic element, the staphylococcal cassette chromosome (SCC mec), carrying a methicillin resistance gene *MecA* which encodes for the penicillin-binding protein (PBP-2A). The Pantan-Valentine leukocidin (PVL) gene encodes a cytotoxin that causes leukocyte destruction and tissue necrosis. Alpha hemolysin (Hla) gene codes for a  $\beta$ -pore-forming  $\alpha$ -toxin that perforates the plasma membrane. Toxic shock syndrome toxin-1 (TSST-1) is a superantigen that over-stimulates T-cells; activated lymphocytes produce a cytokine storm which leads to inflammation and tissue damage. Genomic DNA was extracted from clinical MRSA isolates collected from a tertiary care hospital in southern Louisiana, and used for PCR amplification of *mecA*, PVL, Hla, and TSST-1 genes. The presence of *thermonuc* was used for species identification. PCR confirmation of the presence of virulence genes is a useful tool for epidemiology and understanding the role that these genes play in clinical outcomes.



**Poster Number/Table:** 20/2

**Poster Presentation Time:** 10-11am

**Poster Title:** Early Biomarkers of Environmental Stress in Louisiana Crayfish

**Student Presenter:** Emily Davis

**Co-Authors:** Abby Adams

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Abby Adams

**Abstract:**

Industrial activity in south Louisiana has resulted in the release of environmental contaminants that threaten coastal ecosystems. Among these byproduct contaminants are polycyclic aromatic hydrocarbons (PAHs) which are known to interfere with cellular metabolism in coastal organisms. The red swamp crayfish, *Procambarus clarkii*, inhabits benthic environments where they are exposed to contaminants through water, air, and soil and can thus serve as a sentinel model of environmental stress. This study aims to evaluate the anaerobic respiration enzyme lactate dehydrogenase (LDH) as a potential early biomarker of PAH exposure in crayfish. Because PAH metabolism consumes oxygen, we hypothesize that organisms experiencing PAH-related stress will rely more heavily on anaerobic metabolism resulting in elevated LDH activity. In our diagnostic, enzyme activity is assessed by monitoring NADH formation in real time, providing a sensitive and economically efficient method for quantifying LDH. We have already shown a positive reaction with increasing NADH production by LDH over a 15-minute reaction using crayfish gill tissue in optimal conditions. Crayfish will be exposed to sub-lethal concentrations of naphthalene to validate LDH as a biomarker, and we will also compare LDH activity in juvenile crayfish hemolymph to explore the application possibilities of our diagnostic. Results from this study will support efforts to protect Louisiana's coastal ecosystem and will serve as a foundation for development of a general health diagnostic which can be used to survey Louisiana crayfish to prioritize areas of concern warranting investigation to pinpoint causes of environmental stress such as salinity, hypoxia, and of course PAHs.



**Poster Number/Table:** 21/2

**Poster Presentation Time:** 10-11am

**Poster Title:** Clementine Hunter's Insight Into Modernism

**Student Presenter:** Mia Crooks

**Co-Authors:** Ashley Busby

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Ashley Busby

**Abstract:**

This poster examines the art of 20th-century Louisiana folk artist Clementine Hunter. As an African American woman living on and near Melrose Plantation during the Jim Crow Era, her visual language effectively communicates cultural concepts of community, history, and memory. But, like other folk artists, Hunter's work has historically been associated with Primitivism and Naive art. These genres are often created outside of institutional art spheres and lack, or intentionally disregard, formal artistic training and subject matter. This project uses visual analysis to highlight Hunter's artistic style and larger folk art stylistic tendencies as a mode that lends itself to narrative storytelling. Hunter's style often utilizes vibrant coloration, simplified or abstracted forms, and rhythmic patterns. This challenges traditional academic notions of high art by dismissing focus on anatomical realism and linear perspective. By examining the artistic and historical context of Hunter's work, this project defines Hunter as an artist operating outside of, or on the margins of, Modernism. This highlights the importance of her work in imparting knowledge about what that movement, and Avant-Garde art as a whole, might exclude from the larger art historical canon. Hunter's paintings demonstrate folk art's ability to convey information clearly. She depicts little that must be translated and interpreted outside of her canvas. She paints subjects and events from memory, often featuring scenes of work, leisure, and spiritual practice, in a direct and unfiltered manner easily accessible to universal audiences. Her work imparts information about the human experience equally as clearly as messages portrayed through "high art."



**Poster Number/Table:** 22/3

**Poster Presentation Time:** 10-11am

**Poster Title:** Energy Trade-off in Common Musk Turtles Based on Incubation Temperatures

**Student Presenter:** Michelle Beals

**Co-Authors:** Tim Clay

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Tim Clay

**Abstract:**

Ectothermic organisms rely on energy from their yolk when developing in the egg, which provides a finite amount of resources. During embryogenesis, temperature is significant in facilitating trade-offs between this limited energy and its allocation towards development, growth, and maintenance. We hypothesize that maintenance costs will increase and growth will be reduced at temperature extremes and development will occur quicker at warmer temperatures. We incubated eggs of the Common Musk Turtle, *Sternotherus odoratus*, at four different temperatures: 24, 26, 28, and 30 °C. Before incubation, each egg was assigned an ID and clutch, weight, width, and length were recorded. Upon hatching, incubation days, weight, plastron length, carapace length, and shell height were recorded. Hatchlings at 24 °C had the longest incubation period but were the same relative size as hatchlings from 26 and 28 °C. Meanwhile, 30 °C produced smaller hatchlings and had the shortest incubation period. Embryos in 30 °C were more costly to maintain, withholding energy from growth resulting in smaller hatchlings. Temperatures below 28 °C were the most efficient at maintaining balance between development, maintenance, and growth. Temperature during incubation determines the sex in this species, where females are mostly produced above 28 °C or below 24 °C, thus females are more likely to hatch out sooner, but smaller than males. There was also a high mortality rate in the 30 °C temperature meaning females are more at risk of death before hatching. Overall, hatchling female eastern musk turtles are more likely to experience disadvantages than males.



**Poster Number/Table:** 23/3

**Poster Presentation Time:** 10-11am

**Poster Title:** How Different Temperatures Affect Apple Snail Life History Strategies

**Student Presenter:** Paige Zeringue

**Co-Authors:** Tim Clay

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Tim Clay

**Abstract:**

The giant apple snail, *Pomacea maculata*, is an invasive species that is rapidly spreading throughout the Southeastern coast of the United States. Devastating ecological and economic pressures have been created in areas now inhabited by invasive apple snails. Complete removal of these snails from the US is not an option, conservation efforts should focus on understanding future range expansions. Temperature-dependent life history trials are being conducted that focus on growth, survival, and fertility with captive bred apple snails. Three temperature treatments were set up in triplicate at 20, 25, and 30 oC, each with 20 juvenile snails, approximately 5mm in shell length. Spinach and collard greens are fed ad libitum to the snails thrice a week. A subset of snails from each tank are measured by shell length and recorded weekly. Number of egg clutches produced and mortalities were noted weekly to track reproductive output and survivability. The 30 oC temperature treatments reproduced first, but also exhibited the highest mortality rates, with all individuals in this group not surviving after week 72. The 25 oC treatment snails have produced the most clutches and exhibit similar adult body sizes to snails in the 30 oC treatments. The 20 oC temperature treatments have the highest survival rates, but they did not produce a clutch until week 125. Our research thus far suggests there are temperature dependent trade-offs in life history characteristics. From this research we have produced a preliminary mechanistic model predicting apple snail distribution map across Louisiana and the United States.



**Poster Number/Table:** 24/4

**Poster Presentation Time:** 10-11am

**Poster Title:** Investigating Physical Interactions between Oil and *Vibrio vulnificus*

**Student Presenter:** Trista Bonvillain

**Co-Authors:** Bliss Broussard

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Bliss Broussard

**Abstract:**

The Gulf of America is commonly victim to oil spills, around which increasing numbers of populations of *Vibrio vulnificus* have been discovered. We experimented with this species of bacteria to analyze whether n-hexadecane, an alkane hydrocarbon found in crude oil, induces biosurfactant production, enabling pellicle formation independently of extracellular polysaccharide (EPS) synthesis. We also experimented to analyze whether the EPS itself was allowing adherence to the oil via pellicle formation. We completed a drop collapse assay, math bath assay, and pellicle assay for hydrocarbon adherence. As a result of the drop collapse assay, we observed no collapses in the drops that we expected to collapse, including those inoculated with supernatants from cultures with *Vibrio* that had been pre-exposed to the oil in ASW. Our math bath assay for hydrocarbon adherence under different buffer conditions (ASW and PBS) resulted in the greatest hydrophobic interactions in ASW for both wild type and mutant strains in comparison to the PBS conditions; however, we found the highest percent adherence in the mutant. Via the pellicle assay, we found a significant increase in pellicle formation and thickness in the mutant *Vibrio* strain, which lacks the EPS gene, in comparison to the wild type, which has the gene. By studying the interactions between n-hexadecane and biosurfactant production or EPS in *Vibrio vulnificus* as well as attraction properties, we may be able to conclude that *Vibrio vulnificus* can help to break down oil compounds in bodies of water with the Gulf of America being our focus.



**Poster Number/Table:** 25/4

**Poster Presentation Time:** 10-11am

**Poster Title:** Biodegradation of Trimethoprim, a common antimicrobial, by a Bacterial consortium enriched from Thibodaux Sewage Treatment Plant

**Student Presenter:** Tristan Nilsson

**Co-Authors:** Ramaraj Boopathy

**Institution:** Nicholls State University

**Faculty Mentor:** Dr. Ramaraj Boopathy

**Abstract:**

Antibiotic resistance has been a persistent issue in public health for the past few decades and in the present. Usage of antibiotic prescriptions by medical and animal husbandry practices have led to a distribution in the environment. Antibiotics in excrement and hospital effluents travel to wastewater treatment plants and establish a selection pressure on natural bacteria. Louisiana is one of the top five states to have the highest rate of antibiotic prescriptions. The purpose of the study was to test for antibiotic resistance and biodegradation of Trimethoprim (TMP), a common antibiotic, in the Thibodaux sewage treatment plant. Anaerobic digester sludge was collected and a consortium was created. The consortium was grown in different conditions and concentrations in triplicates for 14 days and was analyzed with high performance liquid chromatography and mass spectrometry on day 0 and day 14. Kinetics of the consortium biodegradation occurred afterwards and was analyzed every 3 - 4 days until day 19. A pure culture was tested for trimethoprim degradation and trimethoprim resistant genes. The results showed that the consortium was able to degrade Trimethoprim in co-metabolic conditions, formed 4 desmethyl trimethoprim after degrading, and followed zero order kinetics. The pure culture isolate was identified as *Bacillus cereus* and was determined to have sulfonamide resistance genes, *sul3* and *sulA*, but did not actively degrade Trimethoprim.



**Poster Number/Table:** 26/5

**Poster Presentation Time:** 10-11am

**Poster Title:** Social Determinants of Cardiovascular Health: A State-Level Comparison Between Louisiana and Minnesota

**Student Presenter:** Christian Bristow

**Co-Authors:** Sadie Smith, Angie Sanchez

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Sadie Smith, MPH

**Abstract:**

This study was a collection and analysis of community health factors and chronic disease prevalence between two states: Louisiana and Minnesota. The goal was to compare cardiovascular (CV) risk factors and outcomes between these two states. The findings highlighted that Louisiana has poorer CV health outcomes and higher risk factors compared to Minnesota. Moreover, social determinants of health further exacerbate risk factors suggesting that interventions should focus on eliminating health, social, and economic disparities to improve CV health.



**Poster Number/Table:** 27/5

**Poster Presentation Time:** 10-11am

**Poster Title:** 200 Years of Chess in New Orleans

**Student Presenter:** Emma Thomas

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Kendric Perkins

**Abstract:**

My initiative to create both an interactive Google My Map and a physical poster tracing the historic and cultural significance of chess in New Orleans represents a significant contribution to public history. Produced through a variety of research methods and community outreach through a partnership with the Historic New Orleans Collection, this project aims to illuminate the rich chess heritage of the city by mapping key locations and people associated with its storied past. By integrating images, articles, links, and historical data into a dynamic digital platform, I have crafted an invaluable resource for both local residents and a broader audience keen on exploring the intricate relationship between New Orleans and chess. Although the digital interactive map includes dozens of names and places, I have also condensed my research into a physical map that displays nine individual people and eight buildings that have been of special importance to the subject at hand. This portable poster is designed to be presented at community chess events to teach chess players about the history of the game in New Orleans up close. As more people become fascinated with the game, through both popular media and the continuous cultivation of the chess community, the map serves as an educational tool that bridges gaps between history and contemporary play. It allows historians, players, educators, and curious tourists alike to discover significant landmarks associated with chess while also providing context about their relevance within New Orleans's broader historical narrative.



**Poster Number/Table:** 28/6

**Poster Presentation Time:** 10-11am

**Poster Title:** Childhood Maltreatment, Trauma, and Working Memory

**Student Presenter:** Jacques Laughlin

**Co-Authors:** Sara Gibson

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Sara Gibson

**Abstract:**

The current study examines Childhood Maltreatment, Trauma, and Working Memory. The focus of the study is on the relationship of adverse childhood experiences and subjective evaluations of traumatic events before the age of 18 with working memory performance. The frequency of adverse childhood experiences and subjective ratings of traumatic events have been associated with impaired working memory performance. However, previous research methods tend to treat these concepts as the same or use similar measures for both interchangeably. The current study aims to apply new methods to examine this potential gap in the current research. To examine the frequency of maltreatment and adverse experiences in childhood, the Adverse Childhood Experiences Questionnaire (Felitti et al., 1998) was administered. For childhood trauma and the subjective ratings of these traumatic events in childhood, the Childhood Trauma Questionnaire (Pennebaker & Susman, 1998) was administered. The CTQ also included questions that assessed how much participants confided in others about the event. As a measure of working memory performance, the Automated Operation Span Task (Unsworth & Heitz et al., 2005) was administered. Preliminary analysis examined 139 participants' scores on each measure. Data analysis revealed a mean AOSPAN score of 39.70 (SD = 17.37), which is consistent with previous research. A Shapiro-Wilk test indicated that the data were normally distributed,  $W(138) = 0.98$ ,  $p = 0.081$ . Based on preliminary data, there were no current significant findings regarding the AOSPAN scores and ACES and CTQ scores. However,

Wilcoxon matched pairs signed rank tests revealed significant differences in all subjective trauma ratings and reported amount of confiding in others about traumatic events related to death, major upheaval, sexual abuse, violence, illness, and life-changing circumstances. These findings present a unique opportunity to explore the relationship between how traumatic an event is to a person and how much that person confides in others about it.



**Poster Number/Table:** 29/6

**Poster Presentation Time:** 10-11am

**Poster Title:** Evaluating Flood Exposure and Resilience of Public Buildings in Coastal Louisiana

**Student Presenter:** Katilyn Kemper

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Donggyu Lee

**Abstract:**

This research focuses on the flood exposure and resilience of public buildings in coastal Louisiana. Public buildings are essential community assets, yet many remain at risk from environmental hazards. Louisiana has experienced multiple instances of irreversible damage caused by extreme weather events, particularly flooding. Schools, libraries, and other public buildings that serve as government facilities are especially vulnerable. Public buildings located in parishes such as St. Tammany, Terrebonne, Lafayette, St. Mary, and Jefferson, identified in the Louisiana State Hazard Mitigation Plan, are vital to residents and continue to face recurring flood risks without proper preventive measures.

This research aims to examine these risks and explore how the resilience of public buildings in flood-prone areas can be enhanced through specific design strategies. An assessment will be conducted to better understand hazard mitigation plans and identify opportunities to improve the protection and resilience of vulnerable public buildings. This will include evaluations of site conditions and exterior design features such as building location, ground elevation, access routes, entry heights, façade materials, and protections for openings.

This research first develops a building-scale flood-risk preparedness framework by reviewing state and parish hazard mitigation plans, then uses visual content analysis to evaluate public buildings in Lafayette through that framework. The analysis focuses on facilities identified in the Lafayette Parish Hazard Mitigation Plan to reflect locally defined priorities and conditions.

The expected outcomes include a public building assessment and a set of design guidelines that link architectural strategies to policy frameworks, supporting long-term resilience in coastal communities.



**Poster Number/Table:** 30/7

**Poster Presentation Time:** 10-11am

**Poster Title:** Site-specific elastic biomechanical properties of articular cartilage degraded with MMPs representing different stages of osteoarthritis

**Student Presenter:** Leah Notto

**Co-Authors:** Asif Istiak, Tanvir Faisal

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Tanvir Faisal

**Abstract:**

Osteoarthritis (OA) is a form of arthritis, caused by the degradation of the articular cartilage at joints. Degraded cartilage leads to joint pain and inflammation, joint stiffness, and limited mobility. Prevalence of OA is mostly observed in elderly, obese, and physically active populations due to the repeated joint loading, impact, and large weights that are inflicted upon the joints. Elevated levels of certain matrix metalloproteinases (MMPs), enzymes that degrade the cartilage extracellular matrix (ECM), lead to the breakdown of collagen fibrils type II and proteoglycan (PG) – the major macromolecules of the ECM. The research focuses on the degradation pathomechanism of femoral and tibial cartilage of knee joints when exposed to MMPs-13 and 9 at different stages of OA. The objective was to determine the extent of enzymatic degradation and its impact variations between femoral and tibial cartilages. The cartilage samples were analyzed as early osteoarthritis (EOA), moderate osteoarthritis (MOA), and advanced osteoarthritis (AOA). A 20% compressive strain was applied using a micromechanical tester to each sample prior to and following treatment with MMPs -13 and -9 and incubation. Results showed tibial cartilage lost more elastic properties after enzymatic degeneration in EOA and MOA compared to femoral cartilages in EOA and MOA, respectively. However, the mean change of elastic modulus of the tibia and femur was close during AOA. This suggests that a higher level of degradation is observed in the tibial cartilage as it experiences higher loads than femoral cartilage. Histological observation also supported these observations.



**Poster Number/Table:** 31/7

**Poster Presentation Time:** 10-11am

**Poster Title:** Development of targeted ML/AI tools to detect cancer in ultrasound images

**Student Presenter:** Olivia Good

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Natalia Sidorovskaia

**Abstract:**

Breast cancer affects breast tissue in mainly women, where the cells become cancerous and rapidly multiply. Mostly, mammogram screening is first used for preventative and diagnostic measures. Ultrasound is often used as additional screening to focus on high-density breast tissue, higher stage cancer, and for women under 45, where mammograms or MRIs may not be ideal. AI tools, e.g., CNNs (Convolutional Neural Networks), could be a valuable tool to aid in analysis of diagnostic images and to determine tumor classification with higher accuracy. AI methods are still in the early stages of application but show promise. Our research goal is to develop a targeted CNN tool to reliably classify breast ultrasound images. We use high-quality dataset from the Cancer Imaging Archive, A Curated Benchmark Dataset for Ultrasound Based Breast Lesion Analysis, for training. The dataset contains 256 ultrasound images with the outlines of tumors plus extensive metadata, including tumor shape and size, patient age, tissue density, and BIRAD score, among other variables. Each image was manually annotated and labeled by an expert radiologist. Our study found that the BIRAD score has a high degree of uncertainty in determining the likelihood of malignancy. In the 4a category, there is a 97% false positive rate for this dataset. Previous clinical studies showed high correlation between tumor shape and malignancy. However, we found a single variable does not determine malignancy. That is why a neural network approach could provide important advancements in cancer diagnostics, where multiple hidden layers would lead to classification.



**Poster Number/Table:** 32/8

**Poster Presentation Time:** 10-11am

**Poster Title:** Creating Safe Spaces for Anxious and Introverted Piano Students

**Student Presenter:** Chandler Johnson

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Dr Chee Hyeon Choi

**Abstract:**

Chandler Johnson is a Bachelor of Music in Piano Pedagogy student. She has given solo performances at numerous events, including Arts in Harmony at the Hilliard Art Museum and the Distinguished Goula Piano Series masterclass. She presented at the Louisiana Music Teachers Association Conference. This research explores strategies to foster a supportive learning environment where introverted or anxious piano students feel safe taking risks and making mistakes as part of their musical growth. Teachers frequently encounter students who appear timid or struggle to engage fully in lessons. These behaviors may stem from personality traits, family dynamics, or a fear of judgment. By building trust and designing student-centered lesson structures, educators can broaden pedagogical perspectives and empower all students to overcome emotional barriers and thrive at the piano.



**Poster Number/Table:** 33/8

**Poster Presentation Time:** 10-11am

**Poster Title:** Staging the Unspeakable: A Costume Design Solution for Bloodless Violence in Big Love

**Student Presenter:** Jayda Bullard

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Suellen Coelho

**Abstract:**

This poster will examine the costume design challenges presented by Charles Mee's *Big Love*, in which fifty sisters collectively murder their grooms on their wedding night. The central problem was representing graphic on-stage violence while preserving the integrity of expensive wedding attire across multiple performances. Traditional methods of simulating blood, such as liquid effects or thrown props like confetti or petals were dismissed for being impractical or totally inconsistent with the gravity of the death scenes. The solution emerged from a focus on the physicality of the actors' movement: small pouches were sewn into the interior of each groom's coat, housing lengths of red fabric. A concealed loop, integrated seamlessly into the jacket's design, allowed the bride to extract the fabric in one continuous motion during the kill, draping it across the groom's body to evoke the visual impression of blood. This method required no cleanup beyond resetting the pouches between performances, leaving all costumes completely unstained. The design demonstrates how material innovation and an attention to an actor's natural movement can resolve the tension between theatrical spectacle and costume preservation.



**Poster Number/Table:** 34/9

**Poster Presentation Time:** 10-11am

**Poster Title:** The Ripple Effect: Causes and Effects of University Noncompliance Found in Financial Audits

**Student Presenter:** Sydnee Johnson

**Co-Authors:** Sydney Montagne and Amanda Vincent

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Dr. Laura Guichard Latiolais & Dr. Eddie Metrejean

**Abstract:**

In this paper, we discuss the causes and effects of noncompliance issues identified in university financial audits. Universities across the southeast have recently been criticized for noncompliant practices that affect students and the university. We wanted to bring light to the issues the higher education system is facing and how there needs to be more awareness on the financial noncompliance that is occurring. Through a data collection methodology, we were able to uncover the leading noncompliance issues universities face, the reasons they occur, and the effects these issues have on university stakeholders and the university as a whole. The audits covered fiscal years 2017 through 2025 and focused on key operational, financial, and compliance areas. Our research uncovered a trend of issues in places such as internal controls, material misstatements, and financial aid compliance. We found that the causes of these issues were primarily linked to high staff turnover and student enrollment. The issues then affected student enrollment and leadership, structural, and budgetary changes to the universities. Through our approach, we aim to gather information on whether universities in the southeast US are using noncompliant financial practices, highlight the kinds of insufficient financial practices universities have, what is leading these universities into their noncompliance, and how universities without sufficient accounting practices can affect stakeholders like students who are affected by the noncompliance.



**Poster Number/Table:** 35/9

**Poster Presentation Time:** 10-11am

**Poster Title:** Cajun Advanced Picosatellite Experiment (CAPE)

**Student Presenter:** Darshan Kumar

**Co-Authors:** Abigail Boggs, Isaac Beverly, Chad Dauphiney, Duy Tran, Rudra Karadkhelkar.

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Farzad Ferdowsi, Nick Pugh, Garth Likens, Dr. Paul Darby, Dr. Jared Tessier, Rizwan Merchant

**Abstract:**

Conventional networks of ground-stations working with LEOSAT(s) or CubeSat(s) do not offer sufficient flexibility and globally scalable transparent coordination of communication. Additionally, conventional networks do not provide instrumentation and actuation of satellites in a way that fully exploits these systems to operate practically for experimental missions anywhere on Earth, or to achieve highly desirable globally scaled experimentation in general. UL Lafayette researchers have invented the Experimental Smart Ground-Station Grid (ESG-Grid) to overcome these limitations. The ESG-Grid is an Internet-cloud coordinated network of one or more LEOSAT(s)/CubeSat(s) combined with a plurality of Terrestrial Participant Devices (TPDs). TPD's may include simple portable or mobile embedded systems-based ground stations, or the same functionality installed in automobiles, boats, planes, drones, ocean buoys, tanks, missiles and/or instrumented robots to name a few. The collective resources and functionality of both satellites and TPDs may be coordinated to achieve novel capabilities, including choreographed and highly economical, automated, transparent, and globally scalable exploration, instrumentation, and experimentation missions, in orbit or anywhere on Earth. The ESG-Grid will be hosted on a government cloud infrastructure to accommodate aerospace missions ranging from unclassified to ITAR/EAR regulated operations. ESG-Grid will route all information through the central server node for complex algorithm-based event scheduling, satellite cluster communications, frequency hopping for optimized RF data rates, and much more. The ESG-Grid is establishing a new satellite communication standard and web-based interface to bring the barrier of entry of data collection and data analysis of aerospace missions as low as possible for academic and industry usage.



**Poster Number/Table:** 36/10

**Poster Presentation Time:** 10-11am

**Poster Title:** Recreating Heatwaves: How extreme temperatures impact maternal provisioning and future evolution

**Student Presenter:** Lana Gaspard

**Co-Authors:** Courtney Patterson, Nicholas Kooyers

**Institution:** University of Louisiana at Lafayette

**Faculty Mentor:** Dr. Nicholas Kooyers

**Abstract:**

Changing climates are leading to more frequent and severe heatwaves, and organisms likely need to adapt, acclimate, or move to maintain adequate population growth. While observational studies of organismal responses to heatwaves are common, few studies dissect how the timing of heatwaves within the growing season differentially impacts population dynamics. We hypothesized that early season heatwaves (pre-reproduction) may have strong evolutionary consequences and affect later phenotypes, while later season heatwaves (post-fertilization) may have effects on maternal provisioning as mother plants may have less resources to provide to their offspring. Here we recreate heatwave events occurring early and late within a growing season using a manipulative growth chamber experiment and seeds from two divergent populations. We measured parent phenotypes, offspring seed mass, and germination rates to assess the influence of varying heatwaves on maternal provisioning. The timing of heatwaves impacted the seed mass of both populations in similar ways. Plants experiencing a late season heatwave had the greater seed mass. However, heatwave timing influenced offspring germination rates in different ways in each population. Offspring from the late season heatwave treatment germinated for both populations, but one population also had earlier germination within the early season heatwave treatment. These results contradict patterns observed in natural populations, where plants experiencing a late season heatwave had small seeds that germinated later. Rapid germination is critical for annual plants that need to avoid increasingly earlier terminal droughts in Mediterranean climates. Thus, our results suggest that maternal provisioning associated with heatwaves may benefit offspring in the next generation.



**Poster Number/Table:** 37/1

**Poster Presentation Time:** 1-2pm

**Poster Title:** Multifunctional, liquid metal embedded soft materials towards seals with embedded electronics for space applications

**Student Presenter:** Emiliana Grove

**Co-Authors:** Micheal Ruiz, Matthew McClung, Kyle Stack, Nathanael Jackson, Gabriel Freedman, Caleb Reid, Olutofunmi Olaoye

**Institution:** LaSPACE (Louisiana State University and A&M College)

**Faculty Mentor:** Robert Herbert

**Abstract:**

Maintaining seal integrity under varying pressures is essential for preventing air leaks and ensuring the reliability of space systems. Failures of these components can result in loss of life, equipment, and mission capability. To address these challenges, this project focuses on developing sensors capable of measuring degradation in space seals to enhance equipment monitoring and safety. The objective is to create printable, conductive O-ring sensors that can be embedded into sealing components, withstand lunar dust and extreme temperature swings, and provide real-time health monitoring to advance next-generation seal technology. Printable O-rings were fabricated using 3D direct ink writing of liquid metal composite containing eutectic gallium–indium, an FKM fluoroelastomer matrix, and silver flakes. Degradation and performance were evaluated through sensor measurements, cyclic and compression testing, controlled damage tests, and exposure to extreme temperatures. The resulting sensors maintain functionality from  $-195\text{ }^{\circ}\text{C}$  to  $300\text{ }^{\circ}\text{C}$ . Future work will demonstrate remote monitoring of compression and damage, characterize sealing properties, and optimize the rheology of the LM–FKM ink system.



**Poster Number/Table:** 38/1

**Poster Presentation Time:** 1-2pm

**Poster Title:** Measuring Artificial Gravity During Suborbital Rocket Flight

**Student Presenter:** John Kiritsis

**Co-Authors:** Nathaniel Wrobel, Abigail Peck, William Patrias

**Institution:** LaSPACE (Louisiana State University and A&M College)

**Faculty Mentor:** Kate Pettrey

**Abstract:**

The primary mission of the Space Tigers payload, funded by LaSPACE through SAFOS, was to produce and measure artificial gravity for a small mass during rocket flight by applying a centrifugal force via a rotating arm. This was done on a Terrier-Improved Orion pressurized rocket, reaching an altitude of approximately 70 miles and spinning 5-7 times a second. Rocket flights produce volatile states of motion, making it difficult to control a steady rotation, especially if the rocket uses spin stabilization. During flight, a rotating arm was used to produce artificial gravity and control an output force of 4 newtons on a steel ball bearing. This project was designed to fly with the RockSat-C program on a sounding rocket from Wallops Island, VA in summer 2025. The primary objective was to measure and control rotational force throughout flight on a steel ball. The LSU Space Tiger's payload achieved the main objective, achieving an output force of 4.00079N during the flight. While the force fluctuated, the RPM reached predicted values. Expected values to maintain were 920 RPM during the Terrier burn and 1178 RPM during the Improved-Orion burn. It was also expected that a spin of 842 RPM was needed when the rocket had no rotation. All of these RPM values were reached, and they occurred at times that match the burn times of the rocket. By first observing how artificial gravity works on a small scale, the concept can then be expanded into more widespread and practical systems on larger and longer flights. A micro-gravity environment has negative impacts on human health, therefore a plan to mitigate these impacts needs to be put into place before long term space flights.



**Poster Number/Table:** 39/2

**Poster Presentation Time:** 1-2pm

**Poster Title:** Explainability of Unsupervised Machine Learning Methods for High-Energy Astrophysics

**Student Presenter:** Skye Strain

**Co-Authors:** Eric Burns, Michela Negro, and Nicolo Cibrario

**Institution:** LaSPACE (Louisiana State University and A&M College)

**Faculty Mentor:** Eric Burns

**Abstract:**

Gamma-ray bursts (GRBs) are the most luminous bursts of light in our universe. They are grouped as long or short based on the events that caused them. Short GRBs tend to be a product of binary neutron star mergers and extragalactic magnetar giant flares, and long GRBs can come from collapsars, a rare type of core-collapse supernovae. The goal of this project is to increase our understanding of unsupervised dimensionality reduction algorithms, using GRB data. Our algorithm is trained through waterfall plots. The waterfall plots are a data product that uses the GRB prompt emission data to characterize events captured by Fermi-GBM. They contain the complete set of spectral, temporal, and correlated information available in our observational data. We utilized the embedding produced with convolutional autoencoders as presented in Negro et al 2025, which is a trusted 30-dimensional representation of the input dataset. This is processed through UMAP, which is a dimensionality reduction technique that reduces the 30-dimensional space to two and three dimensions. The focus of this research is to optimize this algorithm and produce a reliability score for the GRB representation in lower dimensions. This study is crucial to reliably interpret the GRB embedding and rank follow up priorities for other facilities to observe the most interesting GRBs.



**Poster Number/Table:** 40/2

**Poster Presentation Time:** 1-2pm

**Poster Title:** Antioxidant Potential of Rosemary Leaf-Derived Nanovesicles

**Student Presenter:** Corinne Lansing

**Co-Authors:** Shani Griffin

**Institution:** LaSPACE (Louisiana State University and A&M College)

**Faculty Mentor:** Gergana Nestorova

**Abstract:**

Maintaining cellular and mitochondrial integrity under oxidative stress is essential for astronaut health during long-duration spaceflight. Plant-derived nanovesicles (PDNVs) offer a natural and biocompatible strategy for delivering bioactive compounds that protect against cellular stress. This project investigates the antioxidant potential of rosemary-derived nanovesicles (RNVs) as a foundation for developing plant-based countermeasures that promote cellular resilience. RNVs were isolated from rosemary leaves through vacuum infiltration of apoplastic fluid and characterized using nanoparticle tracking analysis, yielding an average concentration of  $3.01 \times 10^8$  particles  $\text{mL}^{-1}$  and a mean diameter of 130 nm. Their antioxidant capacity and polyphenol content were compared to an aqueous rosemary extract, and cellular uptake was confirmed in human dermal fibroblasts (HDFs) using fluorescent membrane labeling. Treatment of HDFs with RNVs reduced intracellular reactive oxygen species (ROS) levels and improved cell viability and morphology under oxidative stress induced by tert-butyl hydrogen peroxide (TBHP). These findings demonstrate that RNVs can deliver stable, phenol-rich antioxidants directly to cells, mitigating stress-related damage. Building on these results, future work will evaluate mitochondrial responses to RNV treatment to better understand their potential as natural countermeasures for maintaining cellular and mitochondrial health in extreme environments, including spaceflight.



**Poster Number/Table:** 41/3

**Poster Presentation Time:** 1-2pm

**Poster Title:** Exploring Mechanical Properties of 3D Printed Resin for Aerospace Applications

**Student Presenter:** Abdelmageed Nour

**Institution:** LaSPACE (Southeastern Louisiana University)

**Faculty Mentor:** Ahmad Fayed

**Abstract:**

This project studies the mechanical properties of 3D-printed resins used for aerospace applications. Tensile and impact tests were performed to measure strength, deformation, and energy absorption. Test specimens were printed using a Phrozen Sonic Mega 8K V2 resin printer, then washed and UV-cured before testing. ASTM standards were followed to ensure consistent and reliable results. The results show how printing orientation, supports, and resin behavior affect the mechanical performance of printed parts.



**Poster Number/Table:** 42/3

**Poster Presentation Time:** 1-2pm

**Poster Title:** Fabrication Strategies for Conductive Hydrogel-Based Wearable Sensors

**Student Presenter:** Riley Guillory

**Co-Authors:** Sophia Justice, Dilip Depan

**Institution:** LaSPACE (University of Louisiana at Lafayette)

**Faculty Mentor:** Dilip Depan

**Abstract:**

This project proposes a literature-driven design for a non-invasive wearable sensor that uses a dual-network conductive hydrogel as its active sensing material. The goal of this work is to outline a fabrication strategy informed by current research on conductive polymers and hydrogel-based sensors. The proposed sensor design incorporates a chitosan-based hydrogel matrix for structural stability and biocompatibility, combined with a conductive polymer such as poly(3,4-ethylenedioxythiophene) (PEDOT) or poly(vinyl alcohol) (PVA) to enable electrical responsiveness. Conductive MXene nanoparticles are incorporated to enhance mechanical strength, electroconductivity, and long-term stability. To fabricate the hydrogel component, digital light processing (DLP) 3D printing and electrospinning will be used to achieve precise geometry and fibrous reinforcement within the sensor. The literature review supporting this proposal highlights how these techniques have been applied in recent scaffold and hydrogel systems to control structure, porosity, and conductivity. The outcome is a conceptual roadmap detailing materials selection, fabrication steps, and testing plans for future experimental validation. Future work will focus on evaluating mechanical robustness, conductivity, and self-healing properties once prototypes are produced. This design proposal represents an early-stage framework for developing flexible, conductive hydrogel-based wearable sensors guided by current literature and fabrication experience.



**Poster Number/Table:** 43/4

**Poster Presentation Time:** 1-2pm

**Poster Title:** Stak 'Em - A Rocket Science Educational Kit for K-12 and Beyond

**Student Presenter:** Susannah Donoghue

**Co-Authors:** Dr. Dhan Fortela, Dr. Ashley Mikolajczyk

**Institution:** LaSPACE (University of Louisiana at Lafayette)

**Faculty Mentor:** Dhan Fortela

**Abstract:**

We asked: what if K-12 students can interact with rocket assembly and testing while learning rocket science? We introduce Stak'em® - a rocket science educational kit. This project specifically aligns with the focus area of the Space Technology Mission Directorate (STMD) and the NASA Office of Stem Engagement (OSTEM). STMD is tasked to lead NASA in transforming future missions while ensuring American leadership in aerospace. With this goal, one of STMD's programs is the "Prizes, Challenges, and Crowdsourcing" program that outsources the public in solving some of NASA's challenges. Our proposed Stak'em® project will start a platform (the Stak'em® Kit) that directly contributes to the education of future workforce for the space industry and to cultivate collaborative minds in the youth of America. The project product Stak'em® Kit will be a demonstration-ready and market-ready kit targeted for K-12 students with the potential to diffuse into a mainstream recreational learning kit for the broader public.



**Poster Number/Table:** 44/5

**Poster Presentation Time:** 1-2pm

**Poster Title:** Functional Communication

**Student Presenter:** Alyssa Pace

**Institution:** Louisiana Tech University

**Faculty Mentor:** Tonya Vandenbrink

**Abstract:**

Functional communication training (“FCT”) is an approach implemented in Applied Behavior Analysis (“ABA”) therapy to assist autistic individuals in dealing with severe maladaptive behaviors by replacing them with contextually appropriate, alternative behaviors. Maladaptive behaviors are any behaviors that hinder a person’s ability to adapt to life’s daily challenges and oftentimes lead to negative outcomes. FCT focuses on the use of functional communication in order for an individual to express their wants and needs without the presence of maladaptive behaviors. The objective of this literature review is to examine the generalizability and lasting effects this approach has on autistic children in a clinical setting ranging from ages two to six through examining various credible resources.



**Poster Number/Table:** 45/5

**Poster Presentation Time:** 1-2pm

**Poster Title:** Poster Title: Arsenic Sensing by Carbon Quantum Dots Synthesized in Hydrothermal Conditions

**Student Presenter:** James D Poole

**Co-Authors:** Muizat Ayoola-Abioye, Aidan Davison, Daude Oyebanji, Kofoworola Fapohunda, Dr. Shengnian Wang

**Institution:** Louisiana Tech University

**Faculty Mentor:**

**Abstract:**

Louisiana has naturally high levels of Arsenic (As) in its ground water, and in turn in its rice, chicken, and fish.<sup>1</sup> Carbon quantum dots (CQDs) are an emerging technology for sensing heavy metals and other common water pollutants. When exposed to various wavelengths of light, CQDs will absorb some wavelengths at certain intensities depending on what is bonded to its surface.<sup>2</sup> This experiment seeks to better understand how As bonding to CQDs reduces the intensity of fluorescence reflected by the CQDs for the development of a luminescent chemical sensor. The limit of detection for these CQDs as a sensor is 1.32 ppb Arsenic.



**Poster Number/Table:** 46/6

**Poster Presentation Time:** 1-2pm

**Poster Title:** Detection of Brown Spot Needle Blight in Loblolly Pine Using Sentinel-2 Data

**Student Presenter:** Kate Montgomery

**Institution:** Louisiana Tech University

**Faculty Mentor:** Dr. Michael Crosby

**Abstract:**

Forestry is a vital component to Louisiana's economy and the top agricultural commodity in the State, contributing approximately \$3.5 billion in value. Forests cover some 14 million acres of Louisiana and of that, over one-third belongs to the loblolly-shortleaf pine forest type which is widely used in forest product development throughout the state. A threat has emerged, in the form of Brown Spot Needle Blight (BSNB), a pathogen that has spread rapidly and widely throughout loblolly pine plantations. To aid in determining the extent and severity of BSNB, freely available remotely-sensed data was utilized to assess and track canopy changes in loblolly pine stands using a time series of image indices over a seven-year period. Growing season vegetation indices were found to reflect BSNB impacts in the forest over the period assessed. Leveraging these data sources provides a means of detecting disturbance early, which would provide forest managers a signal to deploy mitigation measures to avoid further impacts to the forest.



**Poster Number/Table:** 47/6

**Poster Presentation Time:** 1-2pm

**Poster Title:** Vista Rock Island Greenway Collaboration

**Student Presenter:** Mags C

**Institution:** Louisiana Tech University

**Faculty Mentor:** Nick Bustamante

**Abstract:**

Mags Cassuto collaborated with a multidisciplinary team of students and faculty to create a series of educational illustrations for the VISTA–Rock Island Greenway Collaboration, an interpretive signage project designed to enrich visitor experiences along a shared walking, running, and biking trail in Ruston, Louisiana. Supported by the Ruston Convention & Visitors Bureau, the VISTA Center partnered with Louisiana Tech University to produce an initial set of six illustrated signs highlighting natural elements commonly encountered along the Greenway. Each sign focuses on a specific ecological theme, including birds, insects, frogs, water ecosystems, native and non-native species, and fungi. Cassuto contributed to the visual development of the project, helping translate scientific and environmental information into engaging, accessible imagery for a broad public audience. The project aims to add educational value to the Greenway by encouraging curiosity, environmental awareness, and deeper connections to the local landscape. Through illustration and visual storytelling, the signage invites visitors to learn about the region’s ecosystems while actively engaging with the outdoor environment.



**Poster Number/Table:** 48/7

**Poster Presentation Time:** 1-2pm

**Poster Title:** Arthrobacter phage “BenchScraper” is similar to Cluster AY phages with few minute distinctions

**Student Presenter:** Aidan Hidalgo

**Co-Authors:** Avery Hearnberger

**Institution:** Southeastern Louisiana University

**Faculty Mentor:** Justin Anderson

**Abstract:**

The species *Arthrobacter globiformis* is a common soil bacterium and a host we used to discover and isolate 10 novel bacteriophages (also called phages). We also isolated eight phages from *Microbacterium foliorum*, an alternate host. These bacteriophages are a common type of virus which infects a specific host, replicates inside said host, and lyses the cell, releasing more new phages. Examining these phages' genomes gives an insight into their evolutionary history, in addition to finding new applications for phages in biology and medicine—like supplementing antibiotics to help fight superbugs that have become resistant to antibiotics. We sequenced the *Arthrobacter* phage BenchScraper, a lytic phage belonging to Cluster AY. By running genetic analyses, we observed genetic similarities between the phages to determine lineage and the function of their genes. Presently, we are characterizing the growth patterns of all of our phages. This genetic analysis is beneficial for comparing genomes and observing lineages of specific genes and phages.



**Poster Number/Table:** 49/7

**Poster Presentation Time:** 1-2pm

**Poster Title:** An Artist's Contribution to Neuroaesthetics

**Student Presenter:** Brenna Stamper

**Co-Authors:** John Valentino and Blair Gallon

**Institution:** Southeastern Louisiana University

**Faculty Mentor:** John Valentino

**Abstract:**

Neuroaesthetics explores the frontier where neural activity meets artistic analysis. While groundbreaking, this emerging field still lacks the empirical depth to claim full academic maturity. My research bridges this gap by isolating the brain-art connection through a unique methodology that integrates creative practice with scientific observation. Guided by R. Lyle Skain's Practice-Based Research model, I compare two parallel avenues. Contextual research employs methods such as semiotics and comparative analysis, while empirical research applies the "aesthetic triad" to the creative process. After comparison, my thesis argues that neuroaesthetic qualities are already active within traditional art analysis but remain unidentified. By documenting these influences through the active creation of art, further research and specification can contribute to the practicality and vitality of academic artistic pursuits.



**Poster Number/Table:** 50/8

**Poster Presentation Time:** 1-2pm

**Poster Title:** Bias and Ethical Implications of AI-Based Hiring Systems

**Student Presenter:** Carrington Wynn

**Co-Authors:** Dr. Kazim Sekeroglu and Dr. Bonnie Achee

**Institution:** Southeastern Louisiana University

**Faculty Mentor:** Dr. Kazim Sekeroglu

**Abstract:**

This research explores the presence and implications of bias in automated decision-making systems used within the workforce, specifically resume reviews and hiring. As organizations increasingly rely on algorithmic tools to streamline employment decisions, concerns regarding fairness, transparency, and accountability have emerged. This study investigates potential sources of bias within automated decision-making systems by measuring demographic bias in AI-based hiring systems used for résumé screening. The technical approach is supported by a qualitative review of existing literature and ethical frameworks related to artificial intelligence in the workplace. The goal of this thesis is to identify recurring risk factors and assess how current strategies address, or fail to address, these challenges. By situating technical systems within broader social and organizational structures, this research seeks to contribute to ongoing discussions surrounding responsible AI deployment.



**Poster Number/Table:** 51/8

**Poster Presentation Time:** 1-2pm

**Poster Title:** The Influence of TikTok and Social Media Persuasion Techniques on Consumptive Patterns and Practices

**Student Presenter:** Hannah Costner

**Institution:** Southeastern Louisiana University

**Faculty Mentor:** Juliana White

**Abstract:**

My research examines how TikTok and social media persuasion techniques influence consumer consumption patterns and decision-making processes. Drawing on established persuasion and consumer behavior frameworks—including the Elaboration Likelihood Model, Persuasion Knowledge Model, Stimulus-Organism-Response framework, and parasocial interaction theory—this study explores how influencer authenticity, trust, algorithmic personalization, and short-form video content shape consumer attitudes and purchase intentions. Using a mixed-methods approach that integrates existing academic literature with original survey data, the research analyzes how users perceive persuasive intent and how these perceptions impact engagement and consumption behaviors. The findings aim to contribute to a deeper understanding of digital persuasion in contemporary marketing environments, particularly within TikTok’s uniquely immersive platform, and offer insights for ethical marketing practices and consumer awareness in social media-driven marketplaces.



**Poster Number/Table:** 52/9

**Poster Presentation Time:** 1-2pm

**Poster Title:** A Firm Foundation

**Student Presenter:** Dwight Williams Jr.

**Institution:** Southeastern Louisiana University

**Faculty Mentor:** Dr Amber Narro

**Abstract:**

This poster will represent research I explored as I filmed and edited a documentary featuring a local church. I will briefly explore the evolution of the church and share the story of a local church and its growth in context of the history surrounding it. To conclude I will talk about the present state of churches, the public's shifted opinion on the church, and how this church works to spread God's word.



**Poster Number/Table:** 53/9

**Poster Presentation Time:** 1-2pm

**Poster Title:** Genomic and Experimental Analysis of Bacteriophage Characteristics

**Student Presenter:** Avery Hearnberger

**Institution:** Southeastern Louisiana University

**Faculty Mentor:** Justin Anderson

**Abstract:**

The species *Arthrobacter globiformis* is a common soil bacterium and a host we used to discover and isolate 10 novel bacteriophages (also called phages). We also isolated eight phages from *Microbacterium foliorum*, an alternate host. These bacteriophages are a common type of virus which infects a specific host, replicates inside said host, and lyses the cell, releasing more new phages. Examining these phages' genomes gives an insight into their evolutionary history, in addition to finding new applications for phages in biology and medicine—like supplementing antibiotics to help fight superbugs that have become resistant to antibiotics. We sequenced the *Arthrobacter* phage BenchScraper, a lytic phage belonging to Cluster AY. By running genetic analyses, we observed genetic similarities between the phages to determine lineage and the function of their genes. Presently, we are characterizing the growth patterns of all of our phages. This genetic analysis is beneficial for comparing genomes and observing lineages of specific genes and phages.



**Poster Number/Table:** 54/1

**Poster Presentation Time:** 2-3pm

**Poster Title:** Tire-Derived 1,3-Dicyclohexylurea Impairs Photosynthesis and Growth in the Aquatic Macrophyte *Lemna minor*

**Student Presenter:** Layla Thomas

**Co-Authors:** Shila Kandel, Abubakar Abdulkadir, Raphyel Rosby

**Institution:** Southern University and A&M College

**Faculty Mentor:** Dr. Md Ekhtear Hossain

**Abstract:**

Tire wear particles are increasingly recognized as emerging sources of chemical contamination in freshwater ecosystems. Among associated additives, 1,3-dicyclohexylurea (DCU), a compound used in tire manufacturing, remains poorly characterized in terms of ecological toxicity. This undergraduate research project investigated the phytotoxic effects of DCU on *Lemna minor*, a standard freshwater model species for aquatic risk assessment.

Under controlled laboratory conditions, *L. minor* colonies were exposed to DCU (10–100 µg/L). Growth and physiological responses were evaluated through measurements of frond morphology, relative growth rate, photosynthetic pigment content (chlorophyll a, chlorophyll b, total chlorophyll, and carotenoids), and starch accumulation. DCU exposure produced clear concentration-dependent effects, including significant growth inhibition, visible morphological stress, and marked reductions in chlorophyll content, indicating impaired photosynthetic capacity. Elevated DCU concentrations also induced substantial starch accumulation, consistent with disrupted carbon allocation and metabolic imbalance.

These findings demonstrate that DCU, a tire-derived contaminant, can compromise aquatic plant health at low concentrations by interfering with photosynthesis and carbon metabolism. The results underscore the ecological risks posed by tire-associated chemicals and highlight the role of undergraduate research in addressing emerging environmental challenges.

This research was supported by the NSF HBCU-EiR Program (Grant No. 2200607).



**Poster Number/Table:** 55/2

**Poster Presentation Time:** 2-3pm

**Poster Title:** Philosophy as an Asset to the State: Exploring the Benefit of Critical Thinking Experts as Added Perspectives in Aiding Analysis

**Student Presenter:** Carey Hutchison

**Institution:** The University of New Orleans

**Faculty Mentor:** Robert Stufflebeam, Sara Bizarro, Benjamin Aguda

**Abstract:**

Philosophy, as a study and profession, may often be met with skepticism when non-philosophers hear about its great usefulness as a general field. Philosophers study not just history, but historical accounts of the best possible reasoning, how to avoid bias through study of logic, a multitude of ethical models, and many other extremely transferable skills.

The significance of adding a philosopher's perspective to a conversation often is invaluable. A family unit, a business, or any level of government could be assumed to gain benefit from an impartial, logical, and systematic thinker joining a decision making conversation, as their first goal is to examine all angles without bias.

I will be referencing primary sources in philosophy such as Plato, Immanuel Kant, and others. I will also refer to statistical data relevant, especially to the State of Louisiana. Using these, I will present the findings regarding potential usefulness. I plan to refer to specific programs, Louisiana Statutes, and public data regarding the citizens of the State.

Adding this sort of worker to branches of the Louisiana State Government or its Core would lead to new insights and systems for which all of the State would benefit from learning and implementing. I will have a focus on but will not be limited to the Louisiana Department of Children & Family Services, Education, and the Louisiana Board of Ethics.



**Poster Number/Table:** 56/2

**Poster Presentation Time:** 2-3pm

**Poster Title:** Staying on Track: Commuter Rail in Southeast Louisiana

**Student Presenter:** Eian Bailey

**Institution:** The University of New Orleans

**Faculty Mentor:** Guang Tian

**Abstract:**

This investigation explores the history, proposal, and challenges of launching a commuter rail service between Baton Rouge and New Orleans. Planners have long considered intercity passenger rail to address regional transportation issues. However, this complex project is an ongoing discussion between public, private, and political entities, which limits the scope of this study. Despite recent developments, key decisions remain unresolved. The research aims to highlight the socio-economic benefits of investing in a transportation network that is accessible, dependable, and convenient for Louisiana residents. Investing in transportation options beyond the automobile is crucial for enhancing the quality of life in the region and fostering economic development.



**Poster Number/Table:** 57/3

**Poster Presentation Time:** 2-3pm

**Poster Title:** Designing Safe, Emotionally Responsive Game-Based AI Agents with Persistent Memory for Children's Social-Emotional Learning

**Student Presenter:** Gabriel Malone

**Co-Authors:** Shreya Banerjee, Soheil Saneei, Lisa Lisa J Gilmore-Montero

**Institution:** The University of New Orleans

**Faculty Mentor:** Shreya Banerjee

**Abstract:**

Theory of mind (ToM) refers to the capacity to understand that others may hold beliefs, intentions, desires, or emotions that differ from one's own. It is commonly assessed through first- and second-order belief tasks, such as false-belief paradigms and the interpretation of irony or embedded mental states. Although structured interventions (role-playing, storytelling, and engagement with the arts) have shown success in improving ToM performance in controlled or paper-based settings, these gains often fail to generalize to everyday social functioning, particularly for autistic children. One explanation for this limited transfer is that real-world social situations are emotionally intense and unpredictable, with social errors carrying high affective costs. Research suggests that autistic individuals may experience social criticism or failure as unusually distressing, which may inhibit experimentation, learning, and sustained engagement in social interaction. As a result, traditional ToM training may demonstrate task-based success without producing meaningful improvements in lived social contexts. This research proposes that immersive virtual environments populated by AI-driven agents with persistent memory and emotionally responsive behavior could offer a promising alternative. Such environments may provide safe, repeatable, and scaffolded social experiences that reduce the emotional cost of mistakes while maintaining ecological validity. By gamifying social interaction and enabling gradual exposure to complex social dynamics, virtual environments may better support the development of theory of mind skills and facilitate their transfer to real-world social situations.



**Poster Number/Table:** 58/3

**Poster Presentation Time:** 2-3pm

**Poster Title:** Dynamics of Barrier Island Dune Sediments at Caminada Headlands and Chandeleur Islands and a Cross-Comparison of Mastersizer 3000 and Camsizer 3D Sediment Analysis Instruments

**Student Presenter:** Jude Case

**Institution:** The University of New Orleans

**Faculty Mentor:** Mark Kulp

**Abstract:**

The barrier islands are important geomorphic elements of not just Louisiana's coastline but coasts across the globe. With Louisiana being on the forefront of coastal research and a key pioneer of coastal restoration and preservation techniques, research into barrier island dynamics that are abundant in the state can help to better understand processes that impact barrier islands globally. Much of this research comes from the Barrier Island Comprehensive Monitoring Program or BICM which looks extensively at grain size and distribution across multiple barrier island systems along the Louisiana and Texas Gulf coasts. A key part of BICM's data comes in the form of grain size analysis of different regions along the beach face which then can be used to create larger scale plans and data trends to suggest courses of action for barrier island management. This project aims to look at differences in the Chandeleur Islands and Caminada Headlands dune sediments to predict potential greater trends and differences between the systems. Along with looking at differences between the two systems, another goal of this project was to compare results in analysis by two different grain analysis instruments, these being the Mastersizer 3000, the current standard grain-sizing instrument for BICM, and the more modern Camsizer 3D. Preliminary data suggests both significant variation in grain size measurements between the two systems along with significant variation between measurement data from the Mastersizer 3000 and Camsizer 3D.



**Poster Number/Table:** 59/4

**Poster Presentation Time:** 2-3pm

**Poster Title:** An Environmental approach to the Climate Crisis

**Student Presenter:** Naadia Guidry

**Institution:** The University of New Orleans

**Faculty Mentor:** Martin O'Connell

**Abstract:**

Climatology has revealed that extensive imbalances in atmospheric and oceanic systems, are greatly due to the effects of heavy Carbon emissions and greenhouse gasses. Thus, causing ecosystems to graduate into reactionary behavior. The Southeastern United States sits at the genesis region for low-pressure weather systems as its proximity to coastal influences initiates the process for regular cyclone formation. Precautionary measures that combat the degradation of environmental temperaments, while managing against floodwater and the rise in sea level impacts have become a beacon for climatic and ecological strategies. At the grand scale, preventative tactics such as the reinforcement of drainage systems and setting carbon emission caps are continually being strategized. However, at the localized level, preservation methods such as the implementation of Green Infrastructure can actively assist in reducing the onset of flooding by redirecting water flow to natural waterways while also filtering pollutants. This research will expand on structures such as the use and benefits of French drains, bioswales, semi-natural habitats – residential ponds and rain gardens, pervious pavements, rain barrels, and root systems from native plants and how such systems can act as environmental protective mechanisms.



**Poster Number/Table:** 60/4

**Poster Presentation Time:** 2-3pm

**Poster Title:** A Novel Hybrid Deep Learning Technique for Speech Emotion Detection

**Student Presenter:** Oscar Cabezas

**Co-Authors:** Shahana Yasmin Chowdhury, Bithi Banik, Pranish Ghimire, Md Tamjidul Hoque, Shreya Banerjee

**Institution:** The University of New Orleans

**Faculty Mentor:** Shreya Banerjee

**Abstract:**

Nowadays, speech emotion recognition (SER) plays a vital role in the field of human-computer interaction (HCI) and the evolution of artificial intelligence (AI). Recent advancements in SER research have gained growing importance across various application areas, including healthcare, affective computing, personalized services, enhanced security, and AI-driven behavioral analysis. Existing machine learning (e.g., SVM, HMM) and deep learning (e.g., CNNs, LSTMs, Transformers) approaches have significantly advanced, proposing various algorithms for SER. However, these approaches often struggle to fully capture the sequential and contextual dependencies in speech signals, leading to suboptimal emotion classification, particularly in low-resource and noisy environments. To address this issue, we propose a novel sequence-based structured prediction framework that integrates Deep Conditional Random Fields (DeepCRF) with Bidirectional LSTM for detecting emotions in speech, which combines the benefits of deep feature learning with structured sequence prediction. Our proposed DCRF-BiLSTM model is used to recognize seven emotions: neutral, happy, sad, angry, fear, disgust, and surprise, which are trained on five datasets: RAVDESS (R), TESS (T), SAVEE (S), EmoDB (E), and Crema-D (C). The model achieves high accuracy on individual datasets, including 97.83% on RAVDESS, 97.02% on SAVEE, 95.10% for CREMA-D, and a perfect 100% on both TESS and EMO-DB. For the combined (R+T+S) datasets, it achieves 98.82% accuracy, outperforming previously reported results. To our knowledge, no existing study has evaluated a single SER model across all five benchmark datasets (i.e., R+T+S+C+E) simultaneously. In our work, we introduce this comprehensive combination and achieve a remarkable overall accuracy of 93.76%. These results confirm the robustness and generalizability of our DCRF-BiLSTM framework across diverse datasets.



**Poster Number/Table:** 61/5

**Poster Presentation Time:** 2-3pm

**Poster Title:** Stimulation of Left and Right Frontal Language Areas in Children with Autism Spectrum Disorder.

**Student Presenter:** Valeria Alarcon

**Co-Authors:** Alyssa Lacour, Maryanna Gray, Lei'leh Itayem,b and Tracey A. Knaus

**Institution:** The University of New Orleans

**Faculty Mentor:** Tracy Knaus

**Abstract:**

Transcranial direct current stimulation (tDCS) has shown language improvements in a variety of populations, and language/communication impairments are a core deficit in autism spectrum disorder (ASD). The objective was to examine the potential of tDCS, applied over the inferior frontal gyrus (IFG), to improve language skills in ASD children. Anodal tDCS was applied to the left (n=4) or right (n=7) IFG in 11 children with ASD, 6-10 years. Ten tDCS sessions across 5 weeks were administered, with language tests administered pre- and post-tDCS. Results showed individual variability, with some showing improvements in language scores, while others showed no change, and some showed slight declines. The right stimulation group showed slightly more improvement compared to the left group (mean receptive language change R = +1.29 (8.04), L = -1.75 (7.85); mean expressive language change R = +1.57 (4.50), L = -1.25 (2.50)). In the right group, 3 of 7 (43%) children showed improvements in receptive or expressive language, while only 1 of 4 (25%) children in the left group showed language improvement. These findings are consistent with our previous findings examining the immediate effects of tDCS in ASD, with more improvements in fluency after right compared to left IFG stimulation. We plan to expand on our findings with more participants and a sham group. Our results are an important foundation for additional studies further exploring tDCS to right IFG in ASD, including determining who may be the best candidates and how tDCS may be combined with other interventions to improve outcomes.



**Poster Number/Table:** 62/6

**Poster Presentation Time:** 2-3pm

**Poster Title:** Development and Characterization of a novel 3D spheroid system to model metastasis

**Co-Authors:** Aimee Martin, Kathleen Coolidge, Megan Sumera, Anna Keller, Daniela Torres Martir, Emmanuelle Ruiz, Hogyoung Kim, Christopher Williams and Amrita Datta

**Student Presenter:** Anna Keller

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Amrita Datta

**Abstract:**

Conventional two-dimensional (2D) cell culture is typically used to assess in vitro tumor invasion as a model of metastasis prior to progression to animal studies. Three-dimensional (3D) tumor spheroids represent an intermediate, translationally relevant model that bridges the biological simplicity of 2D culture and the physiological complexity of animal models, enabling controlled and higher-throughput experimentation. In this study, we develop a novel 3D breast cancer spheroid system integrated with high-content IncuCyte S3 live-cell imaging to enable continuous, non-invasive, longitudinal assessment of tumor growth, invasion, and phenotypic transitions with enhanced mechanistic resolution and temporal precision not achievable using conventional in vitro or in vivo models, while also preserving tumor-relevant architecture. We specifically examine how disruption of cell adhesion and epithelial polarity contributes to epithelial mesenchymal plasticity and invasive behavior under controlled genetic and pharmacologic perturbations. Ultimately, this system will bridge basic mechanistic understanding and translational applications, supporting the development of strategies to prevent or limit metastatic progression.



**Poster Number/Table:** 63/6

**Poster Presentation Time:** 2-3pm

**Poster Title:** Determination of the Molecular Basis for Erythromycin Resistance Methyltransferase Selectivity through Bioinformatics

**Student Presenter:** Ella Yerger

**Co-Authors:** Juan Otero, Camila Lamy, Hector Mujica, Allyn Schoeffler

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Allyn Schoeffler

**Abstract:**

Antibiotic resistance is a growing public health problem with complex causes. At the molecular level, resistance may be caused by mutation or the acquisition of resistance factors. One such class of factors, erythromycin resistance methyltransferases (Erms), is an important cause of macrolide resistance in group A strep infections. Erms are bacterial rRNA methyltransferases that block the function of macrolides and certain other ribosome-binding antibiotics by methylating adenine 2058 of the 23S rRNA. Though the site of methylation is well understood, the mechanism by which Erms recognize their unique adenine target has not yet been determined, and there is no structure of any Erm family member bound to RNA. Here, we report a unique comparative bioinformatic technique, which we have used to identify potential hotspots of specialization in Erms. We have mutated many of these sites and determined that they result in changes to erythromycin sensitivity in vivo. Our results may be used to map the surface charge sites on Erms that contribute to substrate selection and methylation activity. By better understanding how Erms engage their target, we can advance efforts to combat antibiotic resistance by inhibiting these molecular resistance factors.



**Poster Number/Table:** 64/7

**Poster Presentation Time:** 2-3pm

**Poster Title:** Teaching Undergraduates Toxicology Skills Via a Mock Urinalysis LC-MS/MS Protocol

**Student Presenter:** George Cattan

**Co-Authors:** Nina Ratusznik, C.J. Stephenson PhD, Michael Sosin MS, Anna Duggar PhD

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Anna Duggar

**Abstract:**

Undergraduate forensic science faculty are faced with the challenge of providing relevant practical exercises to accompany theoretical instruction. Instructional laboratory experiments are crucial in forensic chemistry education, as they provide practical experience with experimental techniques and instrumentation, promote a deeper understanding of theoretical concepts, and enhance problem-solving and critical-thinking skills. Efforts to create undergraduate forensic laboratory exercises confront particular challenges, such as safe ways for students to get practical experiences with drugs of abuse (DOA) and biological fluids like blood or urine.

This study develops an undergraduate laboratory experiment based on industry-standard toxicological practices, particularly the application of liquid chromatography-tandem mass spectroscopy (LC-MS/MS). Previous studies introducing undergraduate chemistry students to LC-MS analysis of drugs have focused on the extraction of analytes from non-biological sample matrices. The use of realistic laboratory exercises can additionally provide students with valuable experience with workflows, quantitation, and proper interpretation and reporting of results.

This experiment expands on prior teaching applications to include additional aspects of forensic toxicology, including the safe handling of biological samples, chain of custody, and the use of internal and external standards. The discussion will also center on the operation of a triple quadrupole mass spectrometer with a multi-reaction monitoring scan (MRM), in the context of student learning outcomes related to determining transitions and collision energies. Students also gain exposure to the concept of cut-off levels and SAMHSA and ASB reporting norms.



**Poster Number/Table:** 65/7

**Poster Presentation Time:** 2-3pm

**Poster Title:** Properties study for systematically modified UV-activated solid-state switches

**Student Presenter:** Izabella Stutz-Lazzara

**Institution:** Loyola University New Orleans

**Faculty Mentor:** CJ Stephenson

**Abstract:**

The primary objective of this study is to establish a spectrum of aziridine derivatives that have potential applications as molecular switches and sensors. The synthesis of the photochromic aziridine, substituted NP1-DB (Fig. 1), forms as a response to the rearrangement of an aziridine ring into a heterolytic ring. Photoisomerization occurs between the closed ring, colorless, and the open ring, blue, of NP1-DB when triggered with UV light. The current research attempts to functionalize the three phenyl ring scaffold with the objective of producing derivatives through synthesis and purification. Efforts concentrated on the functionalization of phenyl ring 2' through a four-step reaction, followed by purification by means of a chromatography column. (Control, Nitro, Chloro, Fluoro) were used, as a part of step 4, to synthesize various derivatives of the photochromic aziridine. Analysis of methods, purification techniques, yields, and observations of the substituted NP1-DB are included in the study.



**Poster Number/Table:** 66/8

**Poster Presentation Time:** 2-3pm

**Poster Title:** Know Cancer to No Cancer-Empowering Youth Through Cancer Literacy; a school-university partnership initiative in the Greater New Orleans Area

**Student Presenter:** Margaret Woods-Crawford

**Co-Authors:** Elizabeth MacKenzie, Aimee Martin, Amrita Datta

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Amrita Datta

**Abstract:**

Cancer incidence, late-stage diagnosis, and mortality remain disproportionately high, yet up to 40–50% of cancers are preventable, and early detection dramatically improves survival. Adolescence is a critical period for establishing modifiable cancer risk behaviors, highlighting the need for youth-centered prevention education. Project Know Cancer (PKC) is a long-term, community-based initiative designed to improve cancer literacy, dispel myths, and empower students with prevention strategies through peer-led education. Implemented as a service-learning component in Loyola University’s Cancer Biology course and in partnership with local schools, PKC engages university and K–12 students to deliver interactive workshops, lectures, and educational projects. Preliminary data from over 150 participants across two years demonstrate significant gains in cancer knowledge, reduced fear and fatalism, healthier behaviors, and increased family communication about cancer. Building on this success, PKC aims to expand through the development of CancerWIKI, student-led workshops, and curriculum integration of cancer literacy. PKC provides a sustainable, replicable model that empowers students as health advocates, bridges academic and community engagement, and advances public health goals to reduce preventable cancer burden. Guided by the motto “Know Cancer to No Cancer,” PKC strives to equip the next generation with knowledge and tools to prevent cancer before it starts.



**Poster Number/Table:** 67/8

**Poster Presentation Time:** 2-3pm

**Poster Title:** Chondroprotective functions of NR4A2 in osteoarthritis

**Student Presenter:** Mirialys Diaz-Robles

**Co-Authors:** Jonah Basinger, Heaven Howard, Maya Scott, Kimberlee Mix

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Kimberlee Mix

**Abstract:**

Osteoarthritis (OA) is a major cause of disability in the United States, impacting more than 30 million adults and imposing a significant economic burden on society. Louisiana is among the states with the highest prevalence of OA and arthritis-attributable work limitations. Current OA treatments fail to prevent structural damage caused by the erosion of cartilage and bone, leaving joint replacement surgery as the only option to restore function in end stage disease. We have previously demonstrated that the orphan nuclear receptor NR4A2 is upregulated in OA cartilage and it reduces MMP-1, 3 and 9 gene expression in chondrocytes. Elucidating the mechanisms regulating NR4A2 may lead to the development of novel strategies to prevent cartilage degradation. Since mitochondrial dysfunction and the accumulation of intracellular reactive oxygen species (ROS) perturb cell signaling pathways in OA joints, we aimed to determine the impact of ROS signaling on NR4A2 expression and activity in human chondrocytes. NR4A2 mRNA was induced by fibronectin fragment (Fnf), a pathologically relevant inducer of ROS, and NR4A2 protein was rapidly oxidized in chondrocytes treated with H<sub>2</sub>O<sub>2</sub>. At the functional level, H<sub>2</sub>O<sub>2</sub> antagonized NR4A2 transcriptional activity in reporter assays and cell viability was not affected. RNA-seq was conducted on human chondrocytes over-expressing NR4A2 and differentially expressed genes were identified (n=491 increased, n=427 decreased). GO enrichment identified potential roles for NR4A2 in focal adhesion, cell-substrate junctions, extracellular matrix organization, and other biologically relevant pathways. Furthermore, knock-down of NR4A2 with siRNA reduced chondrocyte proliferation, suggesting that functional NR4A2 may antagonize chondrocyte senescence. Taken together, these findings expand our understanding of the protective functions of NR4A2 in chondrocytes and highlight a novel mechanism of receptor inactivation driven by oxidative stress signaling.



**Poster Number/Table:** 68/9

**Poster Presentation Time:** 2-3pm

**Poster Title:** An expanded evaluation of XRD and SEM-EDS for the characterization of inorganic particles in eyeshadows

**Student Presenter:** Taylin Naquin

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Anna Duggar

**Abstract:**

Cosmetics represent a potential form of transfer evidence. Earlier research investigated the potential of the mineral components of eyeshadows for possible identification of manufacturer, color, or lot, when characterized via a combination of powder X-ray diffraction (XRD) and microscopical and elemental examination using SEM-EDS. Preliminary results on a limited set were promising: across a set of four colors and two manufacturers, diffractograms showed visual differences, with comparisons across colors being less discriminating.

The current work opened the set to five manufacturers and six colors, with palettes selected for visual similarities in color and to cover a range of price points. Given this more complicated dataset, a custom R script was created using the RStudio interface to directly analyze the classifiability of the samples using PCA, LDA, LOO-CV, and HCA cluster analysis.

Our results provide information as to the limits of these methods: although the diffractograms obtained from a few of the manufacturers continued to be distinguishable, other manufacturers seemed less classifiable by XRD. SEM-EDS continued to provide opportunities for differentiation, both in morphology and elemental particle composition. Microscopic particles were often visually recognizable as coming from two different shades or two different manufacturers, and individual particles sometimes demonstrated differences in elemental composition.

Additionally, this work demonstrated that open-source multivariate programming can be used to elucidate complex data systems, making rigorous data evaluation accessible at the undergraduate level.



**Poster Number/Table:** 69/9

**Poster Presentation Time:** 2-3pm

**Poster Title:** Temperature-Specific Specialization in Extremophilic Molecular Machines

**Student Presenter:** Michelle Okoli

**Co-Authors:** Raquel Anguiano Cruz, Carter Dural, Trinity Martin, Isabela Leano, Julia Barnum, Amya Snowden, Allyn Schoeffler

**Institution:** Loyola University New Orleans

**Faculty Mentor:** Allyn Schoeffler

**Abstract:**

Protein engineering can be a powerful technique for developing biological catalysts that operate in extreme conditions with high specificity. Thermophilic enzymes, for example, are widely used in polymerase chain reaction applications, and psychrophilic (cold-stable) enzymes are valuable in bioremediation and food chemistry. One approach to developing extremostable enzymes entails altering mesostable enzymes to function in extreme environments by grafting on features from extremostable homologs. This strategy takes advantage of the ease with which mesostable enzymes can typically be produced or integrated into mesophilic biological systems. Here, we present a framework for this approach using a highly complex, multimeric molecular machine, DNA gyrase, as a test case. DNA gyrase, a heterotetrameric topoisomerase unique to bacteria, offers a well-studied system for investigating how molecular machines have adapted to the extreme environments in which some bacterial species have evolved. Using a novel, in-house bioinformatic program (SWiLoDD), we have identified sequence elements unique to gyrase homologs from thermophilic (hot-dwelling) and psychrophilic (cold-dwelling) organisms. Some of these features match observations from past, proteome-wide studies of extremophilic organisms, but others are incongruent with such broad-scale studies. We show how our bioinformatic approach can be used to identify localized regions of specialization with high statistical confidence. We furthermore report a set of temperature-dependent DNA gyrase activity assays, establishing a baseline to determine whether this enzyme can be engineered to maintain activity in extreme environments. Our results represent a framework for targeted protein engineering of complex enzyme systems with multiple catalytic centers and large-scale conformational changes.

