



# URSA

Undergraduate, Research,  
Scholarship and Arts  
Benedictine University

## Poster Session Program

**April 14, 2022 ❖ 12:30-3:30 pm ❖ Goodwin Hall atrium**

*Student names marked with an asterisk (\*) will be available to discuss their poster from 12:30-2:00 pm.  
Student names marked with a double asterisk (\*\*) will be available to discuss their poster from 2:00-3:30 pm.*

♦ **Noor Abdullah \***

*"Effects of Food Waste on Climate Change: A Study of Strategy and Leading Causes"*

Food has become a common and often overlooked practice that is not often thought of as a major cause of severe climate change. However, in recent years, the data collected have suggested that the level of food wasted globally has increased dramatically, resulting in higher greenhouse gas emissions. I analyze causes of food waste in manufacturing and suggest strategies for large producers to limit their waste. I will also recommend strategies for breaking down food waste that cannot be avoided and techniques that have proven most successful in doing this with the least environmental impact. Some of these practices include converting food waste to animal feed and improving packaging and food management in distribution companies to prevent loss.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Mohammed Abrar \* | \*\***

*"Sustainability Solutions For Costco Wholesale"*

Large corporations, through poor or inefficient business practices, contribute more to environmental degradation than any one individual could. However, improvements like utilizing more efficient anaerobic digestion reactors, changing to carbon dioxide refrigerant, and altering cattle feed can result in broad-scale positive change. The business practices of large retailers, in particular, should be scrutinized since they provide everyday essentials, such as food, clothing, and medication. I will examine the progress of one such retailer, Costco towards their current sustainability goals. Old and new business practices will be assessed to identify inefficiencies and oversights in order to suggest improvements in areas including waste management, purchased energy, and production. These changes should also serve as examples for other retailers to adapt and enhance their current business practices.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Fatima Ala \*\***

*"Tight Junction Dysfunction is BAD: Gut Bugs to the Rescue?"*

Bile Acid-malabsorption diarrhea (BAD) has been identified in 1/3 of patients with inflammatory bowel disease (IBD). Probiotic supplements are used to promote gut health and restore bile acid composition in these patients. We have previously shown that CDCA altered tight junctions (TJ) in T84 cells while its secondary BA, lithocholic acid (LCA), did not. Here, we studied the effect of a probiotic on BA action in T84 cells and hypothesized that probiotics could ameliorate BA-induced apoptosis, oxidative stress and barrier disruption. To study the crosstalk between BA and

microflora, probiotic strains were grown in T84 epithelial cell culture media  $\pm$  BA. Bacteria grew well in control media, and BAs altered microbial growth. 500 $\mu$ M CDCA caused a significant reduction in the growth rate, and LCA reversed the effect of CDCA on growth. LCA $\pm$  CDCA changed the bacterial composition. CDCA (500 $\mu$ M) caused a small increase in apoptosis, while LCA (50 $\mu$ M) did not. CM $\pm$  LCA reversed CDCA's effect on cell death. Thus, BA altered bacterial growth and probiotic reverses CDCA-induced apoptosis and oxidative stress in T84 cells. Understanding the role of probiotics in alleviating BAD could lead to novel therapeutic strategies to treat IBD.

*Faculty sponsor: Jayashree Sarathy, Mark Poch*

♦ **Syed Ali \***

*"Evaluation of the Comparative Validity of a Smartphone Weight-Loss Trial App with 24-Hour Diet Recalls"*

Despite the presence of several weight loss apps on the market, the validity of the diet data they collect has rarely been tested. This study investigated the comparative validity of this data by asking participants to track their food intake using a weight loss app and completing three 24-hour diet recalls. Reported food items were categorized into food groups: beverage, dairy, fats, fruits, vegetables, grains, protein, sweets, miscellaneous, mixed, restaurant. Intraclass correlation coefficients (ICC) determined agreement between app and recall data (i.e., calories, macronutrients) for all food items. A subgroup analysis was conducted to evaluate agreement of energy content by food group. Agreement between the SMART app and recall ranged from moderate to good for all diet data (ICCs=0.71-0.83). When analyzing by food group, agreement between the two diet assessments was excellent for restaurant and sweet food items (ICCs=0.93-0.94), good for beverages, dairy, fruits, and miscellaneous items (ICCs=0.71-0.87), and moderate for vegetables, fat, grains, proteins, and mixed dishes (ICCs=0.51-0.68). There was moderate to good agreement between the app and recall for all diet data. The variability may stem from the types of food reported in the app.

*Collaboration with Northwestern University.*

*Faculty sponsor: Annie W. Lin*

♦ **Mahdia Amatullah \* | \*\***

*"Who Is Eating Whom?: Trophic Dominance In A Phylogenetic Context"*

The human species consumes large quantities of various forms of life. Likewise, many living species use our species for sustenance, causing human mortality. What is the current state of this ancient trophic conflict? We ask this question in a phylogenetic context by grouping non-human taxa into clades, specifically sister clades of organisms whose common ancestors diverged from the clade that would give rise to humans. For example, 320 million years ago, the common ancestor to the Sauropsida (dinosaurs, reptiles, and birds) diverged from the common ancestor to the mammals, which eventually would give rise to humans. We focused on finding quantitative data to demonstrate which species consumes the other and by how much, and vice versa. By converting numerical death rates to biomass, we present these data using a phylogenetic tree. Our findings are fourfold: (1) Humans are the dominant consumer. (2) Human predation is distributed heterogeneously across sister taxa. (3) Most human mortality comes from sister clades (viruses, bacteria, fungi) that diverged long ago from the line leading to humans. (4) Some sister clades (e.g., Sauropsida) show a dramatic change of standing across time, going from dominant predators (dinosaurs) to dominant food source (chicken).

*Faculty sponsor: James Fackenthal, Preston Aldrich, Jeremy Nadolski*

♦ **Mahdia Amatullah \* | \*\***

*"Phage Castor: Analysis of a Lytic Phage that Infects *Arthrobacter globiformis*"*

SEA-PHAGES (Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science) is an undergraduate research program focused on isolation and characterization of bacteriophages, viruses which infect bacteria. Our soil host bacterium for Fall 2021 was *Arthrobacter globiformis*, one of 64 species in the *Arthrobacter* genus. Our soil sample was selected from Bloomingdale, IL, from a compost bin. We hypothesized that the high diversity of microbes would allow for *Arthrobacter* phages to thrive. Our isolation screen yielded one phage, Castor, which was further purified and amplified for characterization assays. Phage Castor creates 1 mm diameter clearings with defined edges suggesting a lytic infection cycle. Transmission electron microscopy (TEM) revealed Castor

contains a virion morphology similar to the Siphoviridae family with a long capsid to host the genome and a flexible tail. Based on genomic analysis, Castor is sensitive to degradation by several restriction enzymes, something that separated it from other *Arthrobacter* phages in the laboratory. Lastly, we determined that Phage Castor can infect *A. globiformis* at two separate temperatures, 22°C and 30°C, with no effects on plaque size. We would like to continue to characterize Phage Castor by studying infectivity through closely related *Arthrobacter* species.

*Faculty sponsor: Tiara G. Pérez Morales*

♦ **Alvic E Araneta \***

*“Air Pollution and its Effects on Infant Health: How Changing Legislation can Improve Air Quality”*

Multiple studies have found a correlation between common air pollutants—carbon monoxide, particular matter, nitrogen dioxide, and ground-level ozone—and negative health effects on infants, including lower birth weight, higher risk of lower respiratory infections, and respiratory-related deaths. Variables such as socioeconomic status and geographic location can also cause affect infant health at birth. Improving and updating legislation, such as by changing the Clean Air Act Amendments (CAAAAs) to cover more emissions, is essential for future generations’ health and safety. The American Academy of Pediatrics (AAP) can persuade the U.S. Environmental Protection Agency (EPA) and other state and local governments to make these updates to the CAAAs. By releasing an official statement, the AAP could persuade many of these agencies to take action and work on reducing common air pollutants.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Andrés Bastidas \***

*“Building the Future with the Past: The Dangers of the Clothing Industry”*

Fast fashion is a viral phenomenon in societies all around the world. To many it is essential, but a large portion of consumers are unaware of the terrible environmental side effects caused by manufacturing clothing. Along with its excessive usage of other natural resources, the clothing industry alone accounts for 79 billion cubic meters of water consumption annually, making it the second largest polluter in the world, just after the oil industry. Companies like H&M and Zara have encouraged the fast fashion trend, increasing the amount of clothing produced and mixing both unhealthy manufacturing practices and bad social trends. I explore solutions in both culture and manufacturing, including the introduction of contemporary trends and advances such as smart textiles and biotechnology.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Gianna Biango, Zein Hammami \*\***

*“Characterization of *Arthrobacter globiformis* Phages LilGB and WinniePooh”*

As part of the SEA-PHAGES program, students isolate viruses (phages) that infect bacteria. For this project, soil was collected from Darien, IL, and Lisle, IL, during Fall 2021. We hypothesized that highly-frequented soil locations would yield high phage diversity. Samples were prepared and tested against the soil bacterium *Arthrobacter globiformis* for the presence of phages. Two phages were isolated from the initial screen and named LilGB and WinniePooh. Phages were purified and amplified for follow-up experiments which included phage plaque characterization, genomic analysis, transmission electron microscopy (TEM) imaging, host range, and/or infection temperature assays. TEM images show that both phages have a virion structure that includes a prolate (extended) head and a long, flexible tail. Based on phage plaque morphologies, LilGB is a lytic phage with clear plaques measuring 1 mm in diameter while WinniePooh is a temperate phage with turbid plaques of similar diameter. Restriction enzyme analysis showed major differences in genomic sequence between phages with LilGB showing higher diversity in DNA fragments. Temperature assays showed both phages can infect at 22°C while WinniePooh can also infect at 30°C. Future analysis would determine genus and/or species specificity for both phages.

*Faculty sponsor: Tiara G. Pérez Morales*

♦ **Mark Blaszczyk \***

*“The Future of Automobiles: Electric vs. Gas-Powered Vehicles”*

Though driving a car has become a convenient and necessary form of transportation for many people, cars emit

harmful particles and gasses into our atmosphere. Climate change and an increase in health problems are the effects that these gasses have on our planet and species. However, electric cars do not produce these kinds of emissions and are the answer to the environmental problems our world is currently facing. Electric car sales have consistently risen annually since 2010, and rightfully so considering electric cars are much more eco-friendly than gas-powered cars are. This poster examines the problems with gas-powered cars and compares gas-powered cars to electric cars in terms of price and sustainability.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Sarah Choudhury \***

“Evaluating the Combined Impact of PM<sub>2.5</sub> Exposure and Low Vitamin D Levels on Multiple Sclerosis Prevalence”

Multiple sclerosis is a degenerative disease of the central nervous system that targets the myelin sheaths of nerve cells. Many studies have identified two especially important risk factors that have linkages to MS: particulate matter exposure (especially PM<sub>2.5</sub>) and vitamin D deficiency. While the association between MS and high levels of particulate matter exposure and the linkage between low vitamin D levels and MS have been studied separately, the combined effect of these two factors has not been examined. Based on current research, I hypothesize that high exposure to air pollution and low levels of vitamin D combined are largely associated with prevalence of MS and MS relapses. My proposed study involves obtaining yearly air quality reports in Chicago to measure PM<sub>2.5</sub> exposure from 2015 to 2020, collecting data about MS cases during this period from MS databases, and measuring vitamin D levels from patient blood tests. This will allow vitamin D deficiency data to be compared to PM<sub>2.5</sub> exposure data, revealing whether MS prevalence is associated with the combination of these two specific risk factors.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Christopher Colvin \*\***

“Prediction of Diet Quality Based on Day-Level Meal Pattern: A Preliminary Analysis Using Decision Tree Modeling”

To address the knowledge gap on how day-level meal patterns (food group intake, meal timing) contribute to diet quality, we use machine learning techniques in this study. We analyzed 24-hour diet recalls from NHANES (N=9761). Food groups were examined, including fruits, vegetables, and whole grains. Proportion of intake for each food group per participant -relative to their daily intake- were input parameters for each meal. Diet quality was computed using HEI-2015. A higher vs. lower quality diet was defined by the 75th percentile of HEI-2015 for the dataset. Decision tree modeling identified the inputs that contributed to the highest information gain and the optimal classification threshold for each input. Fruits and whole grains contributed most to the diet quality prediction model (78% classification accuracy for dataset). Lower quality diets were associated with: a) <2% of fruit and whole grain intake at breakfast; b) >2% of fruit but <2% of whole grain intake at breakfast; or c) >2% of whole grain intake at breakfast but <2% of fruit intake at breakfast and lunch. Higher quality diets were associated with: a) >2% of fruit and whole grain intake at breakfast or b) <2% of fruit intake at breakfast but >2% of whole grain intake at breakfast and fruit intake at lunch. The timing of fruit and whole grain consumption may be important predictors of diet quality.

*Faculty sponsors: Annie W. Lin, Grace M. Mirsky*

♦ **John Creviston \***

“Investigating and Counteracting the Negative Effects of Styrofoam in the Food Industry”

The increasing consumption of single-use plastics, including styrofoam, continues to have adverse effects on the environment and even human health. Styrofoam is not disposed of properly, which causes it to decompose in the wrong place, affecting all aspects of the environment. The public’s general lack of awareness, especially in the food industry, is an alarming trend that will only worsen without a cognitive change. The use of styrofoam only adds to the problems of microplastics polluting water, animals, and the soil. However, styrofoam can be repurposed, whether to treat wastewater or to create a new bonding agent in construction. The food industry, including Benedictine’s dining hall, needs to become better educated about the negative effects of styrofoam on the environment. Using biodegradable products and reducing single-use plastics would be huge steps in the right direction. I also advocate introducing more recycling receptacles in order to create palpable change on campus.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Jenna Demas \***

**“Environmental Sustainability of Organic Foods in Sports Nutrition”**

A switch from traditionally grown foods to organic foods provides a healthier and more environmentally sustainable option. The pesticides and synthetic fertilizers in meats and produce generate detrimental health effects for the general population, but especially for athletes. Even so, there has been little research that connects the organic food industry to the fitness industry. Protein intake, as well as micro- and macronutrients, are vital to an athlete's performance; and many athletes may consume high-protein diets recommended by registered dietitians or health professionals. However, there is a link between higher protein diets, higher greenhouse gas emissions, and heightened eutrophication levels. The Life Cycle Assessment (LCA) and Athlete's Plate (AP) are methodologies that attempt to determine alternative protein sources that can provide appropriate caloric intake for athletes. The results of the studies show gaps in the research about the change to more sustainable food choices, particularly whether alternative proteins such as plant-based sources are a viable option. Sports dietitians will need to evaluate protein synthesis and nutrient absorption, even as the different types of training regimes, diets, and performance models designed by the American College of Sports Medicine (ACSM) and the National Collegiate Athletic Association (NCAA) are assessed in relation to environmental impacts. Research must be conducted for all training modalities and sports to evaluate if organic and more plant-based foods offer the greatest performance benefit while mitigating environmental impacts.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Ramzey Douedari \*\***

**“Survey of the Solar-Photovoltaic Market in the State of Illinois”**

The Sun is a powerful source of clean and renewable energy with the potential of securing a sustainable energy future. Solar-photovoltaic (solar-PV) technology converts sunlight into electrical energy. Although it currently accounts for a small portion of the world's energy production compared to fossil fuels, it exhibits a trend of continuous growth worldwide, especially in the last decade. This paper examines the business aspect of the solar market in the State of Illinois, particularly in terms of costs, incentives, and trends. Different means of energy production in the U.S. and the rest of the world are analyzed and compared with solar-PV. The study also identifies different solar companies in Illinois and offers a comparison between one another in terms of their size, roles, locations, and cost of installed power. Solar electricity generation in Illinois is lagging in terms of local and state incentives, falling behind other leading states in solar-PV technology deployment, including California, Texas, and North Carolina. The current state of the market can be attributed to several barriers to the adoption of solar energy, including the high initial capital cost, lack of investors, and competition with fossil fuels. This study offers a better understanding of the solar-PV market in Illinois, which is an essential step toward identifying avenues for overcoming the aforementioned barriers and securing market growth.

*Faculty sponsor: Stefan Stefanoski*

♦ **George Dumadag \*\***

**“Mainstream Media and the Individual's Capability for Fighting Climate Change”**

Mainstream media can create negative impressions of climate change. As a result, people who would otherwise be passionate about climate change fail to take action. Past studies have observed the relationship between narratives and public opinion; however, research examining direct links between mainstream media narratives and environmental action is limited. This research proposal aims to investigate those links. Exploring which stories promote independent research and environmentally-beneficial behaviors can provide insight into which narratives drive action on climate change. I propose a pre- and post-survey assessing respondents' involvement in sustaining the environment, political affiliation, and knowledge about climate change. The respondents will be split into different groups that will be exposed to a specific narrative for a month. I hypothesize that articles with negative efficacy narratives will discourage environmentally-beneficial behaviors, regardless of political affiliation. Articles with positive efficacy narratives will have varying results based on political affiliation.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Ashley Eaton \***

*“Psycho-Social Influences of Single-Use Plastic Consumer Culture”*

Humanity is entrenched in a cyclical consumer society. Certain psychological and sociological influences, like cognitive bias, discredence, limited behavior, and throwaway culture, have led to these patterns of insatiable consumption. Feelings of comfort and convenience emanate from single-use plastics, like a soda bottle, plastic bag, or even a tampon. Yet these products have resulted in unforeseen environmental consequences, including soil degradation, dumpster oceans, and the consumption of microplastics throughout ecosystems. These mindless habits are too ingrained to expect instantaneous change. However, these are social constructions that can be morphed and reoriented. I propose to measure psycho/social attitudes about alternative patterns of consumption. I expect to find that people will enter the pre-survey with an element of cognitive dissonance. After a presentation emphasizing the consequences of our lifestyles and alternative ways of living, I anticipate a perspective change in the post-survey on individual environmental behavior. Removing single-waste plastic from life is one of the easier environmental problems to solve, but discovering the most efficient way to change behavior is the most difficult.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Samantha Eliceche \***

*“‘The Truth is Far More Frightening’: The Effects of Conspiracy Theories”*

The purpose of this study is to evaluate what kinds of people are susceptible to conspiracy theories and disinformation; I consider whether exposure to various conspiracy theories affects public opinion. My hypothesis is that young voters are especially vulnerable to conspiracy theories they encounter online, in particular on social media, and from sources they trust (e.g., family, friends). I am disseminating a Qualtrics digital survey instrument for use in this class project, with a targeted sample size of N=250 and I hope to determine (1) the extent to which people are encountering disinformation and conspiracy theories, and (2) how their views of politics and government are shaped by these encounters.

*Faculty sponsor: Phillip Hardy*

♦ **Milana Ergarac \***

*“Behavioral Changes: Anti-Anxiety Medications/Anti-Depressants to Alleviate Symptoms of Anxiety/Depression”*

This research project examines the behavioral changes that can occur from the anti-anxiety medications or antidepressants used to try to alleviate the symptoms of anxiety and depression. I will be utilizing Beck’s Depression and Anxiety Inventory as well as the Medication Preference Assessment as part of my survey questions. According to the research, some individuals had positive results from the medications they were taking, while others experienced negative effects. There were also some individuals that didn’t have any effects from the medications that they were taking. I expect to find that the longer an individual takes their medications, the medications that they are taking will no longer influence the individual. Antidepressants combined with benzodiazepines were more likely to reduce depression ratings by 50% or more than antidepressants alone (Trotter, Kelsberg, Anna, 2007) while most notably, over the course of a year, the effects of antidepressant medication and CBT differed by trajectory class. In the severe trajectory class, CBT appeared to have a longer-lasting benefit, as persons receiving CBT continued to improve throughout the experiment, whereas pharmaceutical patients worsened after 6 months (Siddique, Chung, Brown, & Miranda, 2012).

*Faculty sponsor: James Davis*

♦ **Syed Farhan \***

*“Air Pollution and its Effects on Neurological Function: Studying the Long-Term Cognitive Effect of TRAPS on Laboratory Rodents”*

Air pollution contains CO and particulate matter of different sizes, which can have degrading effects related to human neurological function. TRAPs and UFPs target various regions of the brain such as the CA1 region of the hippocampus and the central nervous system, causing decreased white matter volume, lack of myelin, and effects similar to old age. These include neurological diseases such as Alzheimer’s and dementia. Observations regarding

the damage potentially caused by these pollutants may be analyzed using neuroimaging technology, including MRI scans. This study aims to analyze the long-term effects of carbon emissions on the brain by exposing rodents to particular kinds of emissions. I hypothesize that the study will likely show worsened brain structure than that observed in prior research, as well as lowered rates of cognition among the rodents that were exposed, indicating TRAPs have extreme side effects over the long term. Conclusions can then be made regarding which regions of the brain are most directly affected, in turn enabling appropriate action to prevent human health from being affected.  
*Faculty sponsor: Jean-Marie Kauth*

♦ **Hannah Griffith \*\***

*“An Evaluation of the Quality of Commercial Nutrition Apps for Cancer Survivors”*

Mobile nutrition apps can address gaps within the cancer care continuum by providing nutrition education to shape one’s knowledge for improving diet. We investigated the quality of four cancer nutrition apps with knowledge shaping features: Eat AntiCancer, Get Well Soon, Untire, and Vegan Soul Belly. Five oncology dietitians used the validated App Quality Evaluation (AQEL) to evaluate apps in several domains, including knowledge shaping (knowledge acquisition, skill development) and app design (functionality, appropriateness for cancer survivors). Domain scores ranged from 0-10 (score  $\geq$  represented high quality). Fixed effects models determined score differences between apps, adjusting for the rater. Untire had the highest AQEL scores in the knowledge acquisition (mean:  $8.0 \pm 1.2$ ;  $p=0.02$ ). There were no differences in skill development and app design between the cancer apps ( $p>0.05$ ). Only Untire scored highly in the knowledge acquisition, function, and appropriateness for cancer survivorship domains (AQEL  $\geq 8$ ). Untire received high-quality scores for knowledge acquisition and app design while no apps scored highly in skill development. Cancer nutrition apps should consider implementing skill development features to support nutrition care.

*Collaboration with University of Illinois Urbana-Champaign.*

*Faculty sponsor: Annie W. Lin*

♦ **Zoha Hameedi, Mohammed Ansari, Hiba Siddiqui \* | \*\***

*“Doxorubicin Increases the Level of a BRCA2 Exon 3-Skipping Isoform in MCF7”*

*BRCA2* is a tumor suppressor gene that encodes proteins involved in DNA repair. The *BRCA2* gene sequence consists of 27 exons, with exon 3 playing a key role in DNA repair. Inherited pathogenic mutations causing frequent exon 3 skipping during *BRCA2* mRNA processing are associated with a 38%-84% risk for breast cancer and a 16.5%-27% risk for ovarian cancer. Drugs used in cancer therapy are known to have genome-wide effects on splicing patterns, including DNA damaging agents like doxorubicin (Adriamycin). Methods: To determine whether doxorubicin affects the frequency of exon 3-skipping during *BRCA2* mRNA processing in cancer cells, doxorubicin was applied to a breast cancer cell line (MCF7), RNA was extracted, and isoform-specific reverse transcriptase polymerase chain reactions (RT-PCR) were performed to amplify cDNA fragments flanking exon 3. Fragments were resolved and visualized with agarose gel electrophoresis. Results and conclusions: End point RT-PCR reveals doxorubicin increases the frequency of *BRCA2* mRNA exon 3-skipping and may reduce the level of functional *BRCA2* activity in affected cells. This may indicate exon skipping is increased transcriptome-wide in the presence of doxorubicin, potentially contributing both to its therapeutic effects and toxic side effects.

*Faculty sponsor: James Fackenthal*

♦ **Abdallahman Hasan \*\***

*“Fuel Emission and its Effects on Human Health: A Look at Renewable Alternatives for the City of Chicago”*

Fuel emissions are increasing quicker than ever due to the abundance in use of numerous vehicles such as cars, buses, trains, and planes. The increased emission of NO<sub>2</sub> and PM<sub>2.5</sub> into our environment has intensified respiratory illnesses. Chicago city planners have direct responsibility over how much fuel emissions are tolerated in the city. This study will attempt to persuade city planners to enact legislation that transitions the majority of cars from fuel-based to electric power, making them renewable and efficient and thereby reducing COPD and asthma. In the coming years, the city of Chicago should not only provide incentives for the use of electric vehicles, but it should also hold campaigns and encourage the people of Chicago to transition to all-electric. Legislation should be enacted to

maintain an efficient environment that protects human health.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Haya Khalaf \*\***

“Bioinformatic Studies on a Predicted Cas4 Family Endonuclease (Draft\_63) Present in the Genome of Mycobacteriophage Boiitii”

SEA-PHAGES is a program that provides undergraduates with course-based research opportunities to isolate viruses (phages) that infect bacteria and characterize them by annotating their genome using bioinformatic programs. In Spring 2021, our cohort was tasked with the genome annotation of Boiitii, a phage that infects the bacterium *Mycobacterium smegmatis mc155*. Phage Boiitii was isolated in Midland, MI, in 2014 and selected for genome sequencing. Based on sequence conservation, Phage Boiitii is most similar to mycobacteriophages within the family cluster K1. The genome was 59,907 bp long and after annotation, it contained 97 genes and 1 tRNA. Most notably, it contained genes related to bacterial chromosome integration, supporting the hypothesis that Boiitii infects bacteria through a lysogenic cycle. My project focused on annotation and research of gene product Boiitii\_Draft\_63. Through bioinformatic work, we determined that the genomic sequence for Boiitii\_Draft\_63 had gene potential and was 292 aa long. Boiitii\_Draft\_63 is present in a conserved region flanked by DNA enzymes and proteins of unknown function. Protein prediction programs suggest Boiitii\_Draft\_63 is a Cas4 family endonuclease, a protein within the CRISPR system that may be involved in host evasion. Further studies would help confirm this phage protein function.

*Faculty sponsor: Tiara Pérez Morales*

♦ **Robin Lee \***

“How Islam and Muslims are Portrayed in High School Education”

This presentation focuses on how Islam has been taught in the United States. I will show how high school textbooks portray Islam and how they have influenced the public's understanding of the Muslim community by analyzing two high school world history textbooks. In finding the flaws in the current teaching of Islam, I will show the consequences of choosing not to fix them. My presentation will also describe how high school textbooks enable common negative associations with Islam and how they affect the Muslim community. I will suggest how educators can combat these negative stereotypes and foster a more accurate understanding of the Muslim community.

*Faculty sponsor: Rita George-Tvrtković*

♦ **Alexander Leininger \***

“Environmental Damage in the Sports World”

The issue of environmental degradation and excess waste due to sports and sporting events is a major issue, yet one that is rarely considered. Existing research has revealed three main categories of environmental problems caused by sports and sporting events: damage to the climate, damage to water and aquatic life, and production of excess waste. This project aims to determine which of these categories most threatens the environment, how severe a problem it poses, and what actions may be undertaken to resolve it. These solutions include a more organized plastic recycling process; the installation of more complex lighting systems at outdoor venues, which limit the amount of ozone released by artificial lighting; and improved ventilation networks at indoor stadiums.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Cooper Lillich \*\***

“Climate Change and California’s Fire Seasons: A Call for Increased State Response”

After years of drought, decades of climate change, and mismanagement of the energy grid in rural communities, California is facing unprecedented fire seasons. Millions of acres burn every year, scorching forests, fields, and towns alike; the cost of these fires is unprecedented. As these fires worsen, preventative measures must be taken to mitigate future catastrophes. Pacific Gas and Electric (PG&E) was found responsible for many of the worst fires in recent years, including the 2018 Camp fire. Above-ground powerlines were the root cause, but studies have also identified climate change as a probable cause for worsening fires. Despite high initial costs, California should heavily



invest in burying lines to prevent these tragedies. The state should also conduct more research to understand climate change's relation to these fires, allowing for solutions that will mitigate the effects of climate change.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Asher Mir \* | \*\***

*"Exploring the Photophysics of Flavins on a Supercomputer"*

An important component in human health, riboflavin, commonly known as Vitamin B2, is one of several molecules in the flavin family that have a similar structure and are found as cofactors in many flavin-containing enzymes. In enzymes, they typically undergo oxidation-reduction reactions. Riboflavin, when irradiated with appropriate wavelength of light, undergoes degradation and produces products such as lumiflavin and lumichrome. Riboflavin and other flavin based compounds have been studied extensively using experimental and computational approaches to understand their chemical and optical properties. However, a comprehensive computational method has yet to be established for reproducing flavin experimental spectra and the absorption. We have attempted to confirm and build upon previous studies by manipulating different methods to best simulate the absorption spectra of Riboflavin, Lumiflavin, and Lumichrome. We found that the global hybrid method, B3LYP, along with the 6-311G(2d, 2p) basis set in water using implicit solvation, best simulated the absorption spectra. Some of our findings confirm results from previously published computational methods while falling short of expected experimental values. This provides a basis for future explicit solvation approaches to advance the absorption and fluorescence spectra calculations.

*Faculty sponsor: Madhavan Narayanan*

♦ **Asher Mir \* | \*\***

*"Insectarium Development for Pedagogical Support of Introductory Biology Lab (BIOL 1195)"*

The bacterial genus *Wolbachia* is of special interest to contemporary research and education. *Wolbachia* assists in insect vector control by altering the reproductive capabilities of infected arthropods. Benedictine recently created a course-based undergraduate research experience (CURE) for its introductory organismal biology lab (BIOL 1195), using the *Wolbachia*-insect system as a tool for students to become familiar with laboratory techniques and advance research in the field. The project enables students to sequence DNA from arthropods in their own environment. However, since year-round collection of insects from the field is impractical in the Midwest, we created lab insectaria to house local species for use during the winter and to provide infected arthropods for students in this lab.

*Faculty sponsor: Philip Novack-Gottshall*

♦ **Asher Mir, Shaheryar Raza, Mohammed Abrar \* | \*\***

*"Convergence Pathways of Echinoderms in the Cambrian and Ordovician Periods"*

The Cambrian and Ordovician radiations 445-540 million years ago originated the morphological and ecological marine diversity observed today. The echinoderm phylum (including sea stars and sea urchins) was a major participant in these events, with numerous transitions in their ecological life-habits. Here we quantify the extent to which individual echinoderm taxa converged with each other in ecospace. We demonstrate that most early echinoderm classes are phylogenetically constrained to converge only with specific clades that share similar ways of feeding and moving. These ecological combinations seem to form adaptive peaks of high fitness within which species rarely venture out. These patterns suggest there are ecologically defined limits to evolutionary converge.

*Faculty sponsor: Philip Novack-Gottshall*

♦ **Maheen Mohammed \***

*"The Effects of Urban Gardening on Social, Mental and Physical Health"*

In modern times, green spaces have become scarce in urban areas. Research shows many benefits of including greenery in cities, including improved air quality, fewer cases of bronchitis and allergies, enhanced mental health, and expanded social networks from socializing in gardens. This study focuses on the effect of an urban garden in the Chicago neighborhood of North Lawndale on its residents. I expect that introducing a community garden will positively affect the residents' social lives, as well as their mental and physical health. To test this, Triangle

Community Garden participants will be surveyed about their mental health and social relationships after working in the garden. The air pollutants PM<sub>2.5</sub> and NO<sub>2</sub> will be measured in parts per billion near the green space and away from the green space. Social and mental health benefits data will be collected through a cross-sectional study. A multi-frame sampling design will collect data from the general population (n=300).

*Faculty sponsor: Jean-Marie Kauth*

♦ **Kierra Pendill, Susan Rokicki \***

“Subcloning of a Flavoprotein Photolyase Gene into a pET Plasmid to Provide One Step Downstream Purification”

When UV light shines on DNA, it causes DNA damage. One of the common types of UV light induced damage is called cyclobutane pyrimidine dimer (CPD) lesions. These lesions are hazardous, and without correction, could result in permanent DNA mutation with carcinogenic effects or apoptosis. Photolyase is an enzyme present throughout the domains of life which functions in light driven repair of CPD lesions. In this work, we have focused our efforts on cloning the "photolyase/cryptochrome" gene from Planaria, so that the protein can be eventually purified, characterized and its function ascertained. In order to simplify the protein purification process, we have shown preliminary results from our attempt to attach a poly histidine tag using a pET-19b vector to the photolyase gene so that when the protein is expressed in E.Coli., it will have affinity to a Ni-NTA agarose column, and simplify purification. A synthesized gene block of the Planaria photolyase has been previously cloned into a PCR4-Topo vector. The gene block will be subcloned into a pET19b expression vector that will produce a N-terminus Histidine tagged Photolyase enzyme allowing one-step purification on a Ni-NTA column. The purified recombinant photolyase will be further characterized to determine its function.

*Faculty sponsor: Mark Poch*

♦ **Ameer Qadri \*\***

“Simulating Optical Properties of Pteridine-Based Fluorescent Nucleobase Analog Probes”

Natural nucleic acids are largely non-fluorescent, modifications made to their nucleobases can produce fluorescent nucleobase analogs (FBA). FBAs can be used as reporters within DNA and RNA strands to analyze their structure and function based on unique optical properties. 6-methyl isoxanthopterin (6MI) and 3-methyl isoxanthopterin (3MI) are pteridine based FBAs of guanine. 6MI and 3MI are structurally similar to guanine and are therefore able to maintain base-pairing and stacking interactions within genetic material while maintaining a unique absorption and fluorescence spectrum. We completed computational analyses of 6MI and 3MI's optical properties to match to their experimentally reported values. Alterations to the method, basis-sets, and solvation schemes produced simulated absorption spectra that deviated from the experimental data by (25-28nm). The Density Functional Theory method B3LYP and basis set 6-311+G(2d,2p) alongside an implicit solvation model produced the smallest difference between computed and experimental spectra. Further modifications to the solvation schemes namely explicit solvation models may produce more accurate spectra and is being currently pursued. Once the computational approach is optimized, it can be used for the study of optical properties of new potential FBAs.

*Faculty sponsor: Madhavan Narayanan*

♦ **Patrick Salazar, Noreen Hussain \*\***

“Safeguarding Our Specimens (Phase 2): Digitization of the Jurica-Suchy Nature Museum Herbarium”

The Jurica-Suchy Nature Museum is working to digitize its herbarium collection, made up of pressed plants collected around the world in the eighteenth and nineteenth centuries. Our objective is to produce accurate, viewable, and accessible information for each of the herbarium specimens contained in our collection, while also protecting them from potential harm through direct interactions and other external threats. Undergraduate students check each specimen to ensure that it has useable information, then place a barcode label denoting the catalog number onto the backing paper, readying it to be photographed. Images of the specimens are then taken with their catalog card from a top-down perspective, capturing both the plant and its data. The students use these photographs to enter specimen information into an Excel spreadsheet. This document is then checked and verified by a member of the museum staff before being uploaded into the Arctos database where the information can be accessed by the general public for research purposes. This digitization project has enabled the Jurica-Suchy Nature Museum to

capture and share information about its collection to the public for educational and research purposes.

*Faculty sponsors: Karly Tumminello, Colleen Filipek*

♦ **Amtul Sara \*\***

*“Addition of 2-chloro-6-aminobenzothiazole to Produce a Novel Lidocaine Derivative”*

Lidocaine is a powerful analgesic that has proved to be extremely useful in blocking nerve pain and has aided in medical procedures and has also been useful in treating irregular heart rhythms (arrhythmias) and preventing heart attacks. The chemical performs its action by blocking the voltage-gated sodium channels which leads to the reversible blockage of action potential. Structural derivatives based on the functional groups of lidocaine may show similar or even improved biological action. This research targeted the replacement of the secondary amine functional group with 2-chloro-6-aminobenzothiazole and the addition of one carbon to the central core of lidocaine. Purification and characterization with <sup>1</sup>H-NMR spectroscopy of the lidocaine derivative will be described

*Faculty sponsor: Brooks Maki*

♦ **Hiba Siddiqui \* | \*\***

*“The Effects of Ocean Acidification and Coral Bleaching on Corals and Calcifying Organisms”*

Ocean acidification and coral bleaching due to climate change have been impacting marine life, especially harming corals, calcifying organisms, and crustaceans. Corals undergo bleaching due to an increase in ocean temperature, caused by global warming, which harms their symbiotic relationship with nutrient-rich algae, stripping them of their pigmentation and minerals. Shell-forming organisms and arthropods are impacted by high dissolution rates, mineralization of calcium carbonate shells, and an increased energy cost to maintain homeostasis, which is a result of changes in ocean pH levels due to atmospheric carbon levels. I recommend a call to action regarding the effects of ocean acidification and coral bleaching on marine life geared towards nations across the globe, particularly those with high rates of marine tourism and human involvement in marine habitats. Other direct human impacts on marine life include water pollution and harassment of ocean animals, specifically invasion of marine ecosystems as a result of tourism, lax environmental protection policies, and corporate profitability. Major marine advocacy items include the institution of stricter marine-protection programs, limiting marine tourism and overfishing, and reducing amounts of industrial carbon emissions in cities along coastal areas.

*Faculty sponsor: Jean-Marie Kauth*

♦ **Madeeha Syed \***

*“The Social and Environmental Impacts on Political Identities”*

All of us are influenced by the community around us in one way or another, whether that influence be through the content we consume on social media or the individuals we surround ourselves with. Often, we don't realize the impact that our surroundings have on the everyday decisions we make, let alone the political ones. For my senior thesis research, I aim to study the effects that our surroundings have on our political identities. In particular, I am interested in studying the specific people from one's social circles that affect their political decision-making the most. I further hope to understand how social media affects people's political attitudes and preferences. A 17-item survey instrument, administered to Benedictine students through Qualtrics, is utilized, with a targeted sample of N=250. In the survey, respondents are asked various questions related to politics through the lens of family relations and social media use.

*Faculty sponsor: Phillip Hardy*

♦ **Samiha Syed \* | \*\***

*“Asian American Healing and Belonging: Panel and Unity Walk”*

This Interfaith America project will bring together the Benedictine University community through a series of events. A facilitated dialogue on Zoom will be co-led by four prominent Asian-American (AA) leaders: Dr. Russell Jeung, activist scholar and founder of STOP AAPI Hate; Phil Yu, activist, *New York Times* best-selling author, interviewer and blogger; Dr. Corrine Kodama, women's rights activist scholar and co-founder of University of Illinois at Chicago's

Asian American Center; and Dr. Mrinalini Rao, scientist, UIC medical school admissions committee member, and former Vice President of Faculty Affairs at University of Illinois. They will be joined by several AA BenU student leaders. The program will discuss Asian Americans as global citizens as well as their many (and often unrecognized) contributions in the U.S. and internationally. During this program, a virtual world map will be available where threads will connect the heritage countries of panelists to locations in the U.S. These threads will represent the strength to be found in one's roots as an AA as well as the power of coalition, bridging countries and identities. The second program, an Asian American Healing and Belonging Unity Walk, will take place at Benedictine University. Participants will participate in a Unity Walk and student organizations will present speeches on AA leaders. Finally, Junaid Ahmed, an AA activist running for Illinois Congress, will give a speech on representation and civic engagement in AA communities. During this event, participants will be able to write messages of solidarity with Asian Americans on a banner. Healing, belonging and coalition circles will take place for students to engage in discussion and collaborate across faiths and cultures.

*Faculty sponsor: Pat Somers*

♦ **Samiha Syed \* | \*\***

*"Women's Rights in Islam, Islamic Family Law, and Islamic Jurisprudence"*

Stereotypes abound in Western society about how women suffer discrimination and low status in Muslim countries. However, these perspectives are often based on an inaccurate view of Islam. My presentation on women's rights in Islam will focus on four topics: marriage, adoption, divorce, and inheritance. In reviewing these topics, I will engage in a critical review of Islamic texts, such as the *Qu'ran* and *Sahih Bukhari*. My presentation will then examine how Islamic laws have been applied throughout the years and how they are viewed in Western societies.

*Faculty sponsor: Latifa Bounou*

♦ **Nia Young, Aymun Khan, Nicholas Musick \***

*"Lake St. Benedict Ecological Evaluation: Bathymetric Survey, Water Quality Analysis, and Macroinvertebrate Study"*

Lake St. Benedict is a retention lake located at Benedictine University in Lisle, Illinois. Retention lakes manage the negative impact of stormwater on the environment. However, they do require maintenance over time. Researchers observed the lake's fish and macroinvertebrate populations, conducted a bathymetric survey, performed water quality analyses, with the intent to understand the cause of periodic fish kills in the lake. They used this information to develop an understanding of the lake habitat and make recommendations to preserve its ecosystem. It was concluded that the nutrients from the lake sediment may be causing nutrient overload, contributing to eutrophic conditions. Nutrient flux from sediment can be managed with a bentonite barrier. This year, a bench-scale study was performed to evaluate maintenance solutions that could be effective in reducing algal development. These solutions would be evaluated for their ability to diminish nutrient overload and increase long-term oxygen levels in the lake.

*Faculty sponsor: William Schubert*

## **Arthur J. Schmitt Future Leaders Scholars**

The Schmitt Future Leaders program enables undergraduate students to develop their leadership skills and culminates in the design and implementation of a major service learning project. The following posters describe the projects undertaken by this year's Arthur J. Schmitt Scholars.

*Faculty sponsor: Sandra Gill*

♦ **Camryn Dastrup, Lauren Schuster \***

*"Financial Literacy: Supporting Undergraduate Students"*

The Financial Literacy initiative is aligned with national priorities of providing resources to college students to increase financial awareness and wellness post-graduation. This event series is a revitalization of financial literacy courses but recreated as a student-driven program. The program was designed to help students at Benedictine learn vital financial skills that are essential for post-graduate success. To determine which financial topics to prioritize, 106

students in Lisle and Mesa were surveyed to discover what they were most interested in learning about: investing, filing taxes, and financial planning. Three separate virtual events were then planned and hosted with the support of alumni, professors, and local business professionals. At the conclusion of the event series, the 31 Benedictine University students who participated in one or several of the events were provided with supplemental materials to reference following the presentation. One of the difficulties with financial literacy is that there is unlimited information available, but it is difficult to find advice tailored to a student's unique situation. The resources shared throughout the event series and the speaker's contact information have been emailed to all participants for continued reference. Given the outcome of the project, efforts to increase financial literacy can be conducted through coursework and by student organizations associated with the Daniel L. Goodwin College of Business.

♦ **Anna Dudziak \***

"It's as Easy as 1, 2, Walk: An Initiative to Encourage Physical Activity amongst Various Generations of People"

138,000 steps, 60 miles, and one service project later: 'It's as Easy and 1, 2,3' was a project that encouraged people to exercise by raising money to purchase grade school sports equipment in hopes of promoting physical activity in all generations of people. Exercise is not only great for creating social interactions amongst people but is a key component in improved mental health, focus, and enhancing other qualities like time management and commitment. One study has shown that "physical activity appears to have a positive long-term influence on... diseases including obesity, cardiovascular heart disease or type 2 diabetes mellitus" (Reiner, Jekauc, & Woll, 2013). As a sports and exercise science major, I wanted to use my knowledge and passion for the topic not only to motivate people to exercise, but to help the grade school from which I graduated in 2014—a Catholic institution just like Benedictine. Designed to promote physical activity, this project worked well because any group of people could participate, demonstrating that it could be replicated by any other school. The event was successful with nearly 60 miles walked and nearly \$600 raised towards purchasing sports/PE equipment for the Catholic grade school.

♦ **Asfia Farooqui, Ashley Gomes \***

"MOB Majors: Let's Think Post Grad!"

Students pursue business majors for their well-known employment opportunities, especially in accounting, finance, and real estate. However, students majoring in Management and Organizational Behavior are less aware of their specific career options and consistently express concern about their future career paths. This project aims to raise awareness among traditional undergraduate business majors who have not yet established full-time employment and a career path plan. We focused on career information for Bachelor of Business Administration (BBA) students majoring in Management & Organizational Behavior (MOB) and Bachelor of Arts in Management (BAM) majors. We researched a list of careers in high demand in today's job market and then planned and conducted an MOB Event on March 9th, 2022, for declared and undeclared MOB majors on these career options. Three experienced Benedictine University professionals described their career paths and provided early career advice. A post-event survey of 15 attendees showed that the MOB event gave more insight into potential careers that students can pursue after they graduate. We also talked with Goodwin College of Business Student Senate members about making our MOB event a yearly event, so that business majors can continue to learn about career opportunities for management majors.

♦ **Megan Fast, Brian Campbell \***

"CARE (CAreful Recycling Etiquette)"

The CARE (CAreful Recycling Etiquette) project is implementing an environmentally friendly and sustainable recycling project for students at Benedictine. Many schools offer recycling options for their students, and they have a sustainable way to ensure that it is done properly. Combining these best practices with the need for students to have access to recycling that is not offered throughout most of campus pushed our initiative into action. Recycling in Founders Woods from April 6 to May 13, 2022, allows students to follow the core values of the university by being stewards of the environment. Facilities management assisted in this project by supplying bins for the disposal of recyclable materials. In order to promote this initiative, we will paint and unveil a mural above the recycling bins; additionally, we will hold an educational program about proper recycling techniques on April 6 with recycling bingo, trivia, and prizes. Finally, flyers with instructions will be passed out and recycling will begin after the conclusion of

the educational program. After recycling begins, a student sorting crew will sort through recycling weekly to ensure that materials are being properly disposed. The crew will provide feedback if best practices are being followed so that recycling can be done sustainably.

♦ **Gabrielle Illut, Joseph Maldonado \*\***

“EmbRACE: D.E.I. Training and Critical Race Theory for Children”

For this Arthur J. Schmitt Future Leaders project, we teamed up with The Hip Hop Firm and Cortez Watson, a Northwestern University PhD student with extensive experience in youth development, to empower the students of Glen Ellyn Children’s Resource Center (GECRC) by providing a child-oriented DEI program. GECRC’s mission is to “help children from low-income families acquire the necessary skills in academics and social interaction to move successfully through grades K-12 and into adulthood.” Our DEI program is geared towards social interaction and looks to equip them with the necessary skills up to adulthood. Starting efforts to combat racism at a young age is imperative. According to existing literature, children begin to notice differences from physical appearances to languages; later, they prefer those of the same race (Lingras 2021). However, the lack of discussions on race can reinforce biases, stereotypes, and racism (Lingras 2021). Our approach includes a blend of work from The Hip Hop Firm and Watson. Through assessment of GECRC students, we have identified a need for an engaging, energetic program that teaches students to embrace who they are. We will provide a space for students to openly discuss race, helping to guide their understanding. This project will be continued in the future through collaboration with the Hip Hop Firm, which plans to use this experience as a prototype for other DEI training for young children.

♦ **Anjali Maliekkal \***

“Navigating Benedictine as a New Student”

Students who feel integrated into their college academic programs and college social life more often complete their degree. However, almost half of all college students today are non-residential, which limits academic and social engagement compared to the residential student experience. The purpose of this project was to find what University resources Benedictine students use the most and to help them become more knowledgeable about existing resources to be more successful at BenU. A survey was created to identify what students utilized the most and what they wanted to learn more about. Results showed Desire to Learn (D2L) as the most used resource. Therefore, a proposal for a D2L page with various campus resources has been created and is under internal review.

♦ **Ayesha Zubair \*\***

“Reclaiming and Reforming the Narrative Surrounding Hijab”

For years, governments across the world have policed the bodies and choices of Muslim women. In particular, hijabs have been villainized, with anti-Muslim and anti-hijab rhetoric erupting in India in recent years. These events, as well as my own personal experiences, led me to develop this project, which aims to provide a holistic view of what it is to be a Muslim Hijabi woman in America. I built upon the Wear a Hijab Day initiative, which was started by the World Hijab Organization, and added a testimonial portion with a diverse panel of speakers who could share their experiences in the diaspora. In collaboration with the youth council at Islamic Center of Naperville, where I am a youth leader, I was able to host and finance the entire event. In order to make it more broadly accessible and thereby affect more people’s view of Hijab, I reached out to other religious communities. I anticipated about 100-150 attendees, but we hit capacity of about 300 halfway through the event. Based on these results and the feedback I received, I plan on continuing this event annually but would like to expand it into an all-day event/seminar.

## **Graphic Art & Design**

Video presentation of work by Graphic Art & Design students. Projects will be displayed on the large monitor near the entrance to the Goodwin auditorium.

*Students available to discuss their work from 12:30-3:00 pm*

*Faculty sponsor: Hairi Han*

- ◆ **Umama Ayaz**

“Motion Graphics in a Social Justice Poster, Logo Design, Typeface Poster, and Redesigned App”

The element of motion creates a whole new perspective for design. By incorporating both design and motion, we are able to achieve results that are meaningful and intriguing for the audience. This can be done through animated GIFS and interactive platforms such as apps. I created motion animation with projects including my marine pollution poster, Baskerville Typeface poster, and my logo design for a fictional company called Greenhouse Cafe. I also completed an interactive app that is a redesign of the app Goodreads. The motion animation for my poster advocating for marine life shows a blinking effect of a white outline on a human hand and the marine animals. This motion further emphasizes how the human contribution to plastic pollution directly restricts and negatively impacts marine life. The Greenhouse Cafe logo animation depicts the symbol of the sun rotating, as if emanating a source of light and happiness for the consumers of this company. The use of motion animation positively supports and further highlights key concepts of design.

- ◆ **Mya Feustel**

“Animated to Life: A Series of Two-Dimensional Animated Designs”

With simple animation, anything can be brought to life. By creating motion, a story would be able to form while an audience views the design. For the "Plastic Pollution Awareness" poster, the effect of plastic bags flowing in the wind was made to express how prominent plastic has become, and how it creates an abundance of pollution for the Earth. The "Stop Hunting Whales" poster suggests a whale being hung on a loading dock, creating a parallel to overfishing in the ocean. This dramatizes how whales could eventually become extinct as the species is continuously being hunted. The "Fungi Prints" logo has been animated to give the feeling of a printer being used, helping to highlight the idea of a printing company. The "String Ray" app design opens with stingrays moving around on the title screen, which then moves to how the app would be used. This design element highlights how the app can serve as an inspiration board for outfit ideas, allowing users to freely explore all types of fashion and share their thoughts. Through the use of motion animation, designs can come to life and help highlight the importance of the main idea.

- ◆ **Maria Hilby**

“Motion Graphics in Mobile Apps, Logo Animation, Kinetic Typography, and 3D Collage Animation”

Animation gives students a chance to experiment and make their projects come to life. The mobile app "Rigo" was designed to help teenagers to older adults manage a well-rounded healthy lifestyle. The mobile cleaning app, "Hoover and Hum," was designed to help people keep their homes clean in an organized and timely manner. There are several helpful tips and tricks on cleaning with the option to share with others. There are fun animated transitions between the mobile pages. The aim for the logo animation was to express a sense of joy for the brand, "Mia's Peanut Butter" which was accomplished by the elephant's playful dance and the circus music. The kinetic typography animation animates lyrics to the song "Wellerman," a sea shanty which was traditionally sung aboard a large ship. The words were made to appear to the beat of the music and mimic its meaning in their movement. The purpose of the collage animation was to show diverse and aesthetic features of the United States of America. The viewer is immersed in photographs through three-dimensions, then the snapshot moments come to life.

- ◆ **Emma Minelli**

“Conversation in Motion: Animated Poster, Logo, Mobile App, and Thematic Motion Graphics”

"Conversation in Motion" is an interactive, motion graphic series that engages the viewer. Design is a tool used to engage the viewer visually. Motion design uniquely converses with the audience through the use of elements including image, text, color, movement, and sound. To effectively produce dialogue with the observer, I incorporated narrative, speed, motion, and three-dimensionality in the series. In exploring narrative, I integrated story-telling both casually and academically. "The Journey Animation" transports the audience to modern England to explore the historic country as a tourist. By using a combination of text, graphics, and sound, the audience perceives an all-encompassing viewpoint from the stance of a reader or listener. The speed of action and sound directs the

visual understanding of the design. In "The Wonkavator Kinetic Typography," the words come to life by matching the typography's movements to the rapid pace of an audio clip from the movie Willy Wonka and the Chocolate Factory. Integrating three-dimensional aspects to the designs entices the audience to participate in a realistic setting. The "Tea-rific Logo Animation" visually invites the viewer to enjoy a delicious cup of tea. "Conversation in Motion" thus highlights interconnection through digital time-based media.

- ♦ **Tyreese Ray**

"Motion Graphics and Interaction: Ty's Visionary Movement"

Closer observation reveals the message behind a piece of work. For example, the collage-animation "The New World to Come" uses real life experiences to connect with the hope of a better future. The purpose is to incite hope to viewers for a better world in more peaceful conditions. The message is that, despite the world's decaying conditions, there is real hope for a better future worldwide for everyone to enjoy forever. An important focus of this project was to use dynamic movement and keep the unity of the theme throughout, thus creating a unified composition. My goal for these projects is to help the viewers see life from a different perspective, and to incite love and goodness with an optimistic attitude for the future, despite today's challenges.

- ♦ **Lillian Salazar**

"The Message Behind Motion Graphics in Logo Design and Mobile Application"

Logo design is crucial to a business because it creates an identity. Animated logos bring more awareness than static logos as they allow the brand to convey its message through motion. I've created four designs that use motion to deliver a brand's message. Rosebud Audio is a music streaming platform. The logo moves in a box as the equalizer rises in the middle. This enhances the studio platform's meaning of sound. Growth & Wellness is a center for personal growth. Flowers blossoming take place inside of the head, as the individual improves their own mindset. The last logo presented is for Topsy Turvy Winetasting. Wine is poured into a cup to capture the fluid motion of the liquid. Animation can also be included in mobile applications. HUSH is an app that I have created for mental health. Included in my app are four features: Check-In, Chill Out, Chat, and Sleep. The last option is sleep where I provided the user the ability to set a timer and select a sound to dream to. Bringing the logo to life allows the brand to become more memorable and interactive with the audience. It is where the brand's personality comes to life.