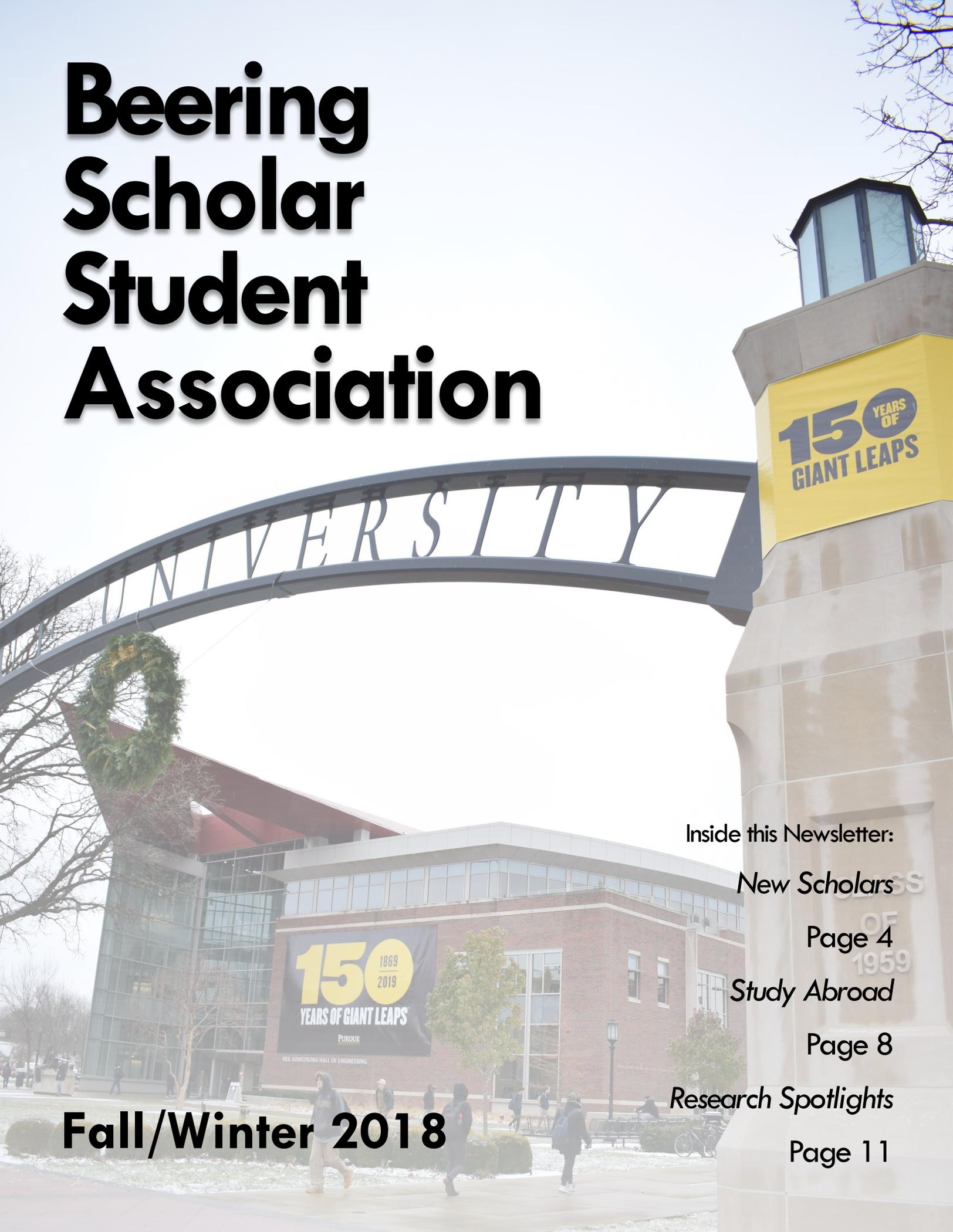


Beering Scholar Student Association



Inside this Newsletter:

New Scholars

Page 4

Study Abroad

Page 8

Research Spotlights

Page 11

Fall/Winter 2018

LETTER FROM THE PRESIDENT

Boilermakers,

Along with the changing colors, cool weather, and a new academic year, fall has ushered in a lot of milestones for Purdue to be proud of. Purdue football alumnus and football star Drew Brees set the NFL career passing yards record; Ryan Gosling starred as Neil Armstrong in the blockbuster movie *First Man*, detailing NASA's mission to land the first man on the moon; and Purdue began celebrating 150 years of Giant Leaps as its sesquicentennial draws near. Following the same momentum, the Beering Scholar Student Association and its remarkable members have months of updates and adventures to share.

Inside, you'll find accounts of Beering Scholars traveling and discovering, commencing and continuing. Andrew Santos puts his spin on the Tour de France, Melanie Martinez and Garrett Mulcahy uncover cultural insights in India, and Nisreen Islaih explores language and religion in Morocco. Kat Li analyzes cell selection data to provide insights into graft engineering during her internship at the National Institutes of Health, and Garrett Mulcahy talks math, from creating a mathematical model of part of the brain to constructing "big, bad matrices." Seven amazing freshmen join the Beering fray, each bringing dreams, goals, and excitement to West Lafayette.

As an organization, BSSA has been as busy as ever. The semester kicked off with a day-long retreat at Shades State Park, where waterfalls were traversed, hot dogs were eaten, and passions were considered. Four Beering Scholar and Honors College alumni shared their experiences and insights at BSSA's fourth annual Honors Alumni Panel. The Beering Scholars were out volunteering in the community as they helped elementary school students build "robotic" arms at Purdue Space Day and raked mountains of leaves for Winterization. BSSA also jumped into the holiday spirit, enjoying a Beeringsgiving feast at Windsor dining court as well watching Beering scholar Ben Coomer make an appearance as Space Santa at the Purdue Christmas Show.

As Boilermakers have been making giant leaps over the past 150 years, the Beering Scholars have been pursuing giant dreams with intent in their eyes and hope in the hearts. For every door opened, path taken, and opportunity seized by the Beering Scholars, the astronomical support of the Beering family, scholarship donors, alumni, advisors, faculty mentors has been at the core. With absolute certainty, you have changed our lives, and words alone cannot express our thanks.

Hail Purdue!

Paul Dawley

Class of 2020



CONTENTS

4 NEW SCHOLARS

8 STUDY ABROAD

12 RESEARCH SPOLIGHTS

14 BSSA ACTIVITIES

NEW YEAR

Grace Johnson

Degree Plan: Natural Resources and Environmental Science

My Beering Story: Growing up in rural Oklahoma presented me with a set of unique opportunities. It was here that I first became fascinated by the environment and the transitions I saw occurring around me as the region exited the worst drought since the Dust Bowl. However, it was not until I moved away from home to pursue a better education for myself that I discovered my true passions lie within environmental science.

Although I knew the direction I wanted to go in life, I was not sure how to begin the journey. Purdue University was a name I often heard at school and at home as I was growing up, but I never considered attending within my reach. Leaving Oklahoma for college was never a viable option for my family and I. However, Purdue's Natural Resources and Environmental Science program was unmatched, and I could not have imagined the events that would occur after I submitted my application.

Receiving the Beering Scholarship has been the greatest honor and blessing of my life. At Purdue, I am not only able to study the environment, but I also have an abundance of opportunities to intertwine my degree with my passion for public policy. In addition, I am fortunate enough to be able to pursue my dreams while removing financial stress from my family, who have sacrificed so much for my education. I will forever be indebted to Purdue University for the Beering Scholarship and for the incredible group of scholars that surround me. I could not be more excited to see where the coming years take me!



Uchehukwu Nnate

Degree Plan: Exploratory Studies

My Beering Story: I've never been comfortable with uncertainty, which is why I'm the type of person who likes to plan her life years in advance. Until senior year I thought that I had a good grasp on what major I wanted to study and what career path I would take, however I realized that I still had a great deal of self-exploration to do and wasn't as confident in my plans as I had originally thought. This is why I'm thankful that I chose Purdue.

Although I have only been here for four months, Purdue has already given me the right resources and opportunities to help me discover what my passions are. For example, the Exploratory Studies program has helped me learn more about myself and the majors/careers that appeal to me the most. In addition, joining Pre-Health organizations such as Caduceus Club has helped me focus on areas of interest in healthcare and community service.

Although I'm still trying to find my niche, I am in the best place to search. I am very grateful to the Beering scholarship that enables me to continue to explore what Purdue has to offer without a financial burden. Thus far, I have enjoyed volunteering with and getting to know my fellow scholars and love the inclusive atmosphere of the Beering community. I am certain that there are great opportunities ahead and I am excited to see where the next four years take me!



NEW FACES

Mili Jha

Degree Plan: Aerospace Engineering & Computer Science

My Beering Story: For as long as I can remember, my future plans have centered around being in school. Whether I wanted to be a lawyer, an astronaut, a writer, or a chef, my core interests were simply in being student as long as I could, and learning about everything that interested me.

Early on, I had acknowledged that a higher education was pertinent to achieving my goals. And as I fell more and more in love with engineering, I realized higher education for me didn't just stop at a bachelor's degree.

Pursuing a doctorate and going into research has been my lifelong dream, which is why I cannot even begin to describe how surreal it feels for that to be a tangible path I am setting foot on now. I am eternally grateful to my parents for fighting for a life in America, for an increasingly better life that has granted me the ability to pursue my passions. And now, I am overwhelmingly honored to have the support of the Beering Scholarship and the awe-inspiring people I have met because of it. I hope to get as much as I can out of my time at Purdue, but given that being a Beering Scholar is a lifelong privilege, I plan to use its resources to totally, completely, thoroughly change the world.



Khunsha Ahmed

Degree Plan: Health Sciences Pre-Professional Pre-Medicine

My Beering Story: "The fibula is next/According to my text /Then comes the tibia/ That ain't no fibia". From the moment I heard these words as I watched Hannah Montana, I knew that I wanted to pursue medicine. It all happened like a quick snap of the phalanges. Things have definitely changed since then, but the passion I have for medicine has not. Every aspect, from human interactions to the complicated physiology that occurs in each of our cells, interests me. Throughout high school, I started looking into specific disciplines within medicine, and was overwhelmed by the number of choices had ahead of me. Yet, after gaining experience in a kidney cancer research lab my junior year, I realized that I was fascinated by where the medicine we put into practice originates. Thus, I am majoring in Health Sciences Pre-Professional Pre-Medicine, with the hopes of pursuing an MD/PhD so that I can be a part of the research "behind the scenes" aspect, but also put my findings into practice.

While I had my plan in mind senior year, I was skeptical of being able to achieve such a long term goal, and wondered if it would ever turn into reality. The moment I got the call for the Beering Scholarship, everything fell into place and I knew that I could pursue my dreams without fear of the uncertainty of my path ahead. At Purdue, I hope to become a more active part in the community and gain experiences that expand beyond my comfort zone. Whether it is volunteering with the Red Cross or completing research in a medical physics lab, I am enthralled to see how these experiences will shape my future. Being part of the Beering Scholar Student Association inspires me, and I am very grateful for the sense of community I feel with the amazing scholars around me!



Bryce Colón

Degree Plan: Pharmaceutical Science, minor in Sociology

My Beering Story: Purdue is the alma mater of innumerable aunts, uncles, grandparents, cousins, and both of my parents. It is the institution that brought together the unlikely combination of a young woman from South Dakota and a young man from Puerto Rico. It is the institution that produced me.

Growing up in Noblesville, Indiana afforded me abundant opportunities. I was able to study abroad in Spain for a summer, developing invaluable fluency in Spanish. I conducted metabolic and endocrine research at the IU School of Medicine, forming an intimate understanding of epigenetic manipulation and liver disease amelioration. I was guided and nurtured by enlightening English teachers who instilled in me the confidence to write competitively; I received seven awards for my writing at both the regional and national levels of the Scholastic Art & Writing competition. My high school years allowed me to explore broad and multifaceted interests - I was never held down to one discipline or pursuit. Noblesville High School produced the first iteration of myself.

Now Purdue is the institution that will transform me. In the few months I have been here, I have been selected for a position on Purdue's Student Concert Committee. I have carved out an hour of my week to host my own radio show. I also hope to conduct research in my undergraduate years, especially research focusing on both the sociology and neurobiology of addiction, as well as alternative pharmaceutical treatments for chronic pain and mental illness. I seek to build on these experiences as I perform graduate work and pursue either a PhD or MD. I've considered multitudinous paths, from being a physician at a pain clinic to working on developing and implementing drug and pharmaceutical policy. I am confident that Purdue and the Beering Scholarship will allow me to continue explore and achieve my broad and multifaceted interests. I already know that I will not be held down to one discipline or pursuit. I look forward to Purdue producing another iteration of me.

"We come from dust and we return to dust" is the analogy I will use here, but in the most positive light possible. I came from Purdue and I have returned to Purdue.



Omar Abdalla

Degree Plan: Engineering

My Beering Story: Hi! My name is Omar Abdalla. I was born in Chicago. I lived in Egypt for two years. I graduated High School in Louisville, Kentucky. I am one of four siblings. I am in First Year Engineering here at Purdue University, hoping to become a Biomedical Engineer.

In freshman year of high school, I wanted to be a historian. On January 25, 2011, the Middle East was erupting as the Arab Springs started to arise. I witnessed history unfold during the prolonged Winter break. Hence, I felt like a historian. But in my Junior year of high school, things changed. Gravity started bringing down my grades in my Physics Class. I will be honest: Physics was not easy. It took me about two years to confidently say "I have a strong background in physics." The struggle I faced in physics is the reason I am an engineer today.

So far at Purdue, it has been a struggle. But it's okay. People do not grow without failure. People cannot understand the light if there is no darkness. People cannot do ENGR 16100 without long nights punching papers. I want the struggle, I want to grow, I want to help people, and as an Engineer, I want to change the world. We were told the world has its problem, and we all have our different ways to solve them. This is why we are all here right? Even, if we do not fix the world's problems, at least we will try. Boiler Up!



Evan Gold

Degree Plan: Interdisciplinary Science

My Beering Story: Picture an orange sunset, blue waves, and gold sand. Now, picture a flat land. To your right? Corn. To your left? Corn. But in between...something spectacular. I grew up in San Diego, California and when most people find out that I go to school in Indiana they are shocked. They ask me, why move from the ocean? The 365 days of impeccable sunshine? To them, I answer with one word: Opportunity.

Ever since I was a child I loved the idea of the “unknown”. I was mesmerized by both the elusiveness of the physical laws that govern our world and the mystery surrounding our own people. I loved language, culture, and travel, but I also found beauty in Newton’s Laws, and planetary orbits. Throughout most of my high school journey I worked diligently with both of my passions, but as discrete entities. I would revel in physics books, but I would also dive deep into cultural phenomena while running a club dedicated to transforming the educational system of a small school in the Peruvian Amazon.

Coming to college, I wanted to pursue my passion...but which one? Physics and astronomy? Or language and culture? A good grade on a high school physics test would make me want to choose the former; yet, an exciting breakthrough in my club’s work would urge me to pick the latter. I was torn.

Thankfully, I have found a place where I can do both. Here at Purdue, I intend to major in Interdisciplinary Science, specializing in physics and supporting my study with coursework in language and political science--particularly international relations. As such, I am currently involved in a Spanish program which allows me to practice the language while preparing Colombian exchange students for research presentations. Simultaneously, I am a part of an organization which confronts prominent issues in high school science education. My goal with this unorthodox plan of study is to blend the technical with the cultural, to help as many people as possible wherever my journey takes me...even if that means leaving the cool waters of San Diego.



STUDY ABROAD

France: The Alps Were Made for Climbing

By Andrew Santos, B.S. Physics, May 2020



My dad's side of the family originated from the Philippines. My mom's side has been in the United States for several generations. Growing up with these separate cultures intertwining in every aspect of my life, I thought I knew what it meant to understand other cultures. Our family parties brought together Filipino food and classic barbecue, Tagalog and English, playing music together and playing bags outside. Despite this upbringing, however, the experience of studying abroad in Arles, France, for nearly two months this past summer challenged my understanding of separate cultures. It was a surprise. It was even unsettling, but for that I am inexplicably grateful – to my new French friends scattered across the planet and to the Beering scholarship for supporting my every step.

The French language has been an integral part of my life for about a decade now. Close friends and teachers helped push me past milestones in comprehension and speaking. This journey in learning French went as far as staying in the southern half of France for a couple weeks in my senior year of high school. A couple years later, though, connections made abroad through a freshman research collaboration compelled me to go back. I decided to take this giant leap in June to finish up my Business French minor.

Here is the greatest lesson I could ever have learned concerning cultural awareness. I have been in French classrooms for the better half of these past ten years. Even with the addition of countless French YouTube personalities I've followed online since the start of this process, I was grossly unprepared to fathom how profound of an effect a summer experience could have. Sometimes, you never grasp how the world is so similar despite its incredibly differences until the first language barrier tumbles in front of your eyes and someone's personality shines through.

What I hold dear and will continue to cherish are the moments when days and nights with my host family and new friends transcended language and upbringing. These were the moments when discussions around the dinner table gave way to cultural quips – when strangers turned friends over French pizza welcomed me to their neighboring hometowns and when hanging out by the Rhone river became more and more frequent, only to be stopped by the onset of heavy eyelids and yawning all too universally understood.

Northwest Indiana and my hometown of Valparaiso are far from France, but I can only express my gratitude for this. As much as I wish to climb the French Alps again soon and to jump on trains delayed by inevitable strikes, none of this would have been possible without an entire ocean separating me from Arles, France. The fact that we are all different is beautiful and we should do nothing less but celebrate it.

Morocco: Red Roofs and Ramadan

By Nisreen Islaih, B.S. Biology, May 2020



The restaurant balcony provided a panoramic view of the sea and in the distance, you could faintly make out Spain.

Morocco has the sweetest tea, the warmest people, and the bluest sky, all of which I was able to experience through the generosity of the Beering Scholarship. This past summer, I studied Arabic in the heart of the Middle Atlas mountains in Morocco. The sleepy, alpine town known as Ifrane is home to Al Akhawayn University, whose red-roofed academic buildings nearly resembled those at Purdue (in the dark with my eyes closed). I participated in the intensive Arabic and North African Studies program offered at Al Akhawayn, which allowed me to learn Arabic for five hours a day, five days a week for five weeks. Despite my intentions to practice Arabic, I frequently found myself exercising my 7 years-worth of French classes to navigate the country, creating conversations with Moroccan locals that were an exciting mix of English, French, and Arabic.

The timing of the study abroad program further supplemented the Moroccan experience, as it fell on the final two weeks of Ramadan. I had my first taste of what it's like to celebrate Ramadan on a national level over my first weekend in Morocco while my roommate and I took a spontaneous trip to

Tangier. As a fasting Muslim, I did little to prepare for the train ride, which extended over an hour past the time of iftar – the breaking of the fast. However, as iftar time approached, passengers were handed small packets of dates and a water bottle. The train subsequently came to a stop for 15 minutes during iftar to allow the train crew to also break their fast. For experiences such as this one, I quickly came to love spending Ramadan in a Muslim-majority country, where the overwhelming sense of unity is tangible and unlike anything I've ever experienced as a Muslim in the US.

Through the university, I was taught by incredible professors, learned Arabic calligraphy, star-gazed in the Sahara Desert, and got lost in the labyrinth streets of the Medina in Fes. The experiences I had in Morocco were unforgettable, and I am so grateful to the Beering Scholarship for funding this opportunity.



Beautiful mosaic ceiling of the Al Akhawayn University amphitheater



Rooftop view from the hostel, waiting for the call to prayer at sunset

India: Diving into Delhi

By Garrett Mulcahy, B.S. Mathematics, May 2021, and
Melanie Martinez, B.S. Genetics, May 2021



When we signed up for the Honors College “India: Waves of Globalization and Labor” study away program, not only were we going for the lessons on international political economy and emigration, but also for the food, culture, and experience of being in a new country, if just for a little while. Upon arriving in Delhi, we were immediately thrown into situations we never would have experienced in the U.S., such as riding a rickshaw to the Qutub Minar and attending a professional cricket match. If nothing else, Delhi was exuberant. The city was colorful, diverse, and always in motion. While the country has ancient monuments and layers upon layers of history, the newly independent nation is still discovering its identity, and it was exciting to be in the hub of such a unique community.

After our week-long stay in Delhi, we traveled to Kolkata, a city on the Bay of Bengal. Some of our favorite sites included Flurry’s, a hip brunch nook, Naturals, which had the best ice cream in all of India, and the Mother House of the Missionaries of Charity, where Mother Teresa did her mission. We also got the chance to take a cruise along the Hooghly river and observe the flower market that takes place near its shores.

While Kolkata provided insight into India’s colonial history of labor migrations, our final location, Kochi, provided the setting for our study of contemporary labor. Kochi is located in the southern India state of Kerala and is vastly different from the two cities we previously visited. For example, beef was legal and their language, Malayalam, was completely different than the Hindi and Bengali scripts we were used to seeing. In Kerala, we were able to visit an elephant sanctuary, tea plantation, and Fort Kochi, where we were able to dip our feet in the Indian Ocean.

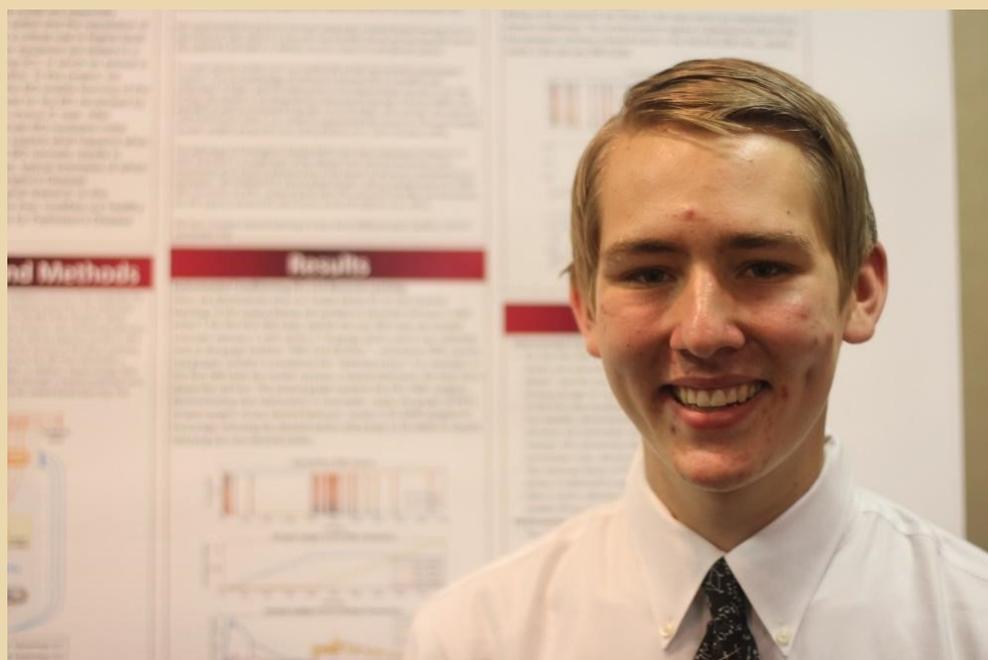
Our three weeks in India was unlike anything either of us had experienced before. In addition to lessons on labor migration policy, we learned and experienced so much. We are so grateful to the Honors College as well as Dr. Duncan and Dr. Anwer for providing the experience of a lifetime!



The Basal Ganglia and Big, Bad Matrices: Research in Math

By Garrett Mulcahy, B.S. Mathematics, May 2021

The thing that most excited me about starting college was the opportunity to participate in research. I always get the biggest rush from learning something new, so I figured that I would achieve great joy from actively creating new knowledge (new to everyone this time, not just me)! In the last couple of months, I had to opportunities to pursue math research in both applied and theoretical settings— each experience has been challenging yet rewarding, and I am excited to share a little bit about them!



This summer, I participated in an NSF-funded Research Experience for Undergraduates (REU) at Indiana University-Purdue University-Indianapolis (IUPUI). The focus of this REU was mathematical biology, and my specific project concerned developing a model for the basal ganglia. In a nutshell, the basal ganglia are a collection of nuclei located deep beneath the cerebral cortex that (among other things) are especially concerned with higher-level behavioral dynamics (i.e. choosing specific actions). Most of my work focused on simplifying a pre-existing model and applying it to a new task to explore reward-based instrumental conditioning. Then, I explored what happened when the basal ganglia go awry by transforming my model into a disease model for Huntington's Disease and Parkinson's Disease (two diseases of the basal ganglia). Some other highlights of this summer included exploring Indianapolis, my dad visiting me for the 4th of July, and having a lot of fun with the other eleven undergraduates in the program!

Starting this fall, I began research in pure math with a professor here at Purdue University. My project is concerning a paper by prolific 20th century scientist John von Neumann. Essentially, von Neumann proved the existence of very large matrices that possess some rather nasty properties. However, his argument was not constructive; that is, it did not give an explicit way to create these matrices. That is where I am coming in: using computational techniques guided by theory, the hope for my project is to give a construction for these big, bad matrices. This is going to be a long-term project, but despite only having worked on it for a few weeks I am already thoroughly enjoying it and have learned so much!

Ultimately, it is incredibly fulfilling to see the lofty goal I set several years ago to get involved with research suddenly come to fruition. I am so grateful for the opportunities I have had to learn more about the different fields of math research as well as develop meaningful relationships with research mentors. I am especially grateful to the Beering scholarship for allowing me to devote so much time and effort to this research— I am able to dive deeply into my work (both research and coursework) without worrying about juggling a job on top of everything, a luxury I would not have been able to afford without the generosity of all those who contribute to this wonderful scholarship.

Grafting a Great Summer: Cell Selection Analysis

By Kat Li, B.S. Chemical Engineering, May 2021

The field of human health is a passion of mine, and I have always been fascinated by what we still have to learn about the human body. In the past, I had the privilege of performing basic research in an RNA Biology lab at the National Cancer Institute. While my experience was invaluable, I knew I wanted to experience research in a clinical setting, with a direct impact on patients. This past summer, I turned this aspiration into a reality by interning at the Clinical Center, the research hospital of the National Institutes of Health (NIH).

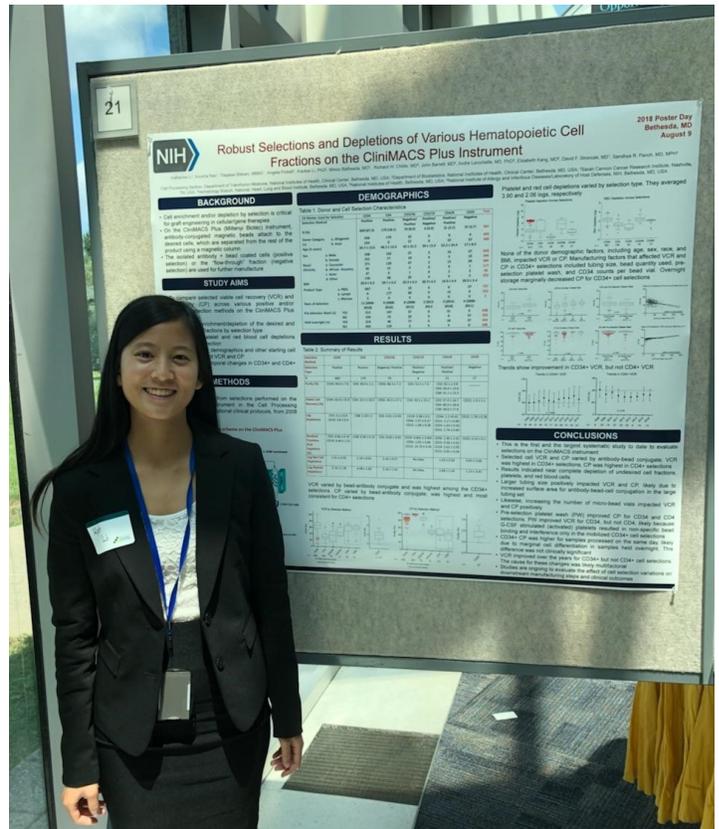
I worked in the Center for Cellular Engineering (CCE) in the Department of Transfusion Medicine. The CCE acts as a cellular and gene therapy “factory”; we support clinical trials run by other investigators by manufacturing the products they need. One field of interest for us is graft engineering, or the concept of maximizing the efficacy of a transplantation while minimizing the risks of adverse immune response or graft versus host disease (GvHD). Graft engineering has broad applications, especially for hematopoietic stem cell transplantation, which is used to treat leukemia. A powerful tool for graft engineering is cell selection - separating desired cells from the rest of

blood sample for further processing. The instrument used for cell selection is the Miltenyi CliniMACS Plus.

Along with a fellow summer student and a postdoctoral research volunteer, I compiled a database of all cell selections performed with the CliniMACS Plus over the past ten years. This database, which contains 991 records in total, is the first and largest of its kind. We examined factors such as patient demographics and manufacturing practices and investigated their effect on the purity and recovery of desired cells. Examining this data will allow us to evaluate temporal trends, as well as provide a frame of reference for future cell selections. Ideally, this database will allow us to identify any systematic steps that can be taken to improve recovery rates and purity. In the future, we hope to explore what impact, if any, improved purity and cell recovery has on clinical outcomes like successful patient engraftment and treatment.

After many long days compiling data, creating graphs, and performing analyses, I presented my findings to other interns and NIH employees at Summer Poster Day. In addition, we submitted an abstract of our project to the American Society of Hematology (ASH) for their annual meeting. We were thrilled to hear that our abstract was accepted, and I am personally very excited to share that I will be presenting the poster.

I am beyond thankful for my mentors, both here at Purdue and at the NIH, who provided me the opportunity to engage in such a meaningful and enriching project. My experience not only taught me a great deal, but also reinforced my passion for the biomedical sciences. As I continue my studies, I am incredibly excited to see where this passion takes me next.



BSSA ACTIVITIES



Leadership Retreat: After the first week of classes, the BSSA welcomed new Beering Scholars with a retreat at Shades State Park. It was a day full of hiking, games, and goal-setting by the campfire.

Homecoming Honors Alumni Panel:

We were so grateful to work with the Honors College to host Honors and Beering alumni for a fourth year. This year's esteemed panelists (*below*) shared how their Purdue experiences shaped their careers.

Dr. Myron White, '90, Industrial Management

Dr. Elizabeth Getto, '11, Nuclear Engineering

Amit Soni, '16, Aero & Astro Engineering

Sarah Correll, '16, Agricultural Economics



Discussion Salons:

A few years ago, one of our Beering alums, Abby Lemert, started hosting "salons" where BSSA members could discuss current events and big ideas over tea and snacks. The salons have become a fun way to challenge ourselves to think a little more critically, more globally, and more compassionately.



Winterization:

For just one Saturday, Beering Scholars put down their pencils and picked up rakes and leaf bags! Each year, the BSSA volunteers for Winterization, a campus-wide event that mobilizes Purdue students to do yardwork for elderly and disabled residents of Tippecanoe County.



Space Day:

Another annual service activity for the BSSA is Purdue Space Day, an outreach event that brings elementary - and middle-school students to campus to engage in space-themed activities and hear from an astronaut. This year, the astronauts-in-training worked in teams to design mechanical arms capable of picking up objects during EVAs.

“Beerings-giving”:

Nothing can replace Thanksgiving at home, but Thanksgiving in the dining courts is a close second! We’ve continued the tradition of having a little Beering family Thanksgiving meal by tasting some turkey, sipping on cider, and stuffing our selves with stuffing!





We hope you enjoyed catching up with the Beering Scholars!

The world moves fast, and few places move faster than the world-class Purdue University. Our goal is to continue to build a Beering network, hearing stories from and offering opportunities to all.

We invite you to join the Beering conversation by filling out our brief survey at: <http://goo.gl/blbkBz>

Visit our BSSA website to find our upcoming events, study abroad and internship destinations, photo gallery, and news-letter archives:

<https://beeringscholars.wixsite.com/bssa>

Or email us at: purdue.beeringscholars@gmail.com

This newsletter would not be possible without the contributions of a great many. We would especially like to thank Dean Rhonda Phillips and Ms. Catharine Patrone, our BSSA advisors.

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