RISE NEWSLETTER





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Editorial Staff: Mohamed Bah, Shi Johnson-Bey, Zachary Sheffield, Amy Nicolas, Tobias Mazal, Kierstyn Harris The editors wish to extend their gratitude to all who contributed articles to this newsletter and aided in its publication.

RISE Student Advisory Council Members (RSAC): Zachary Sheffield, Amy Nicolas, Shi Johnson-Bey, Kierstyn Harris, Tobias Mazal, Khalil Wynn

I am pleased to invite you to share in this edition of the RISE Program Newsletter. Throughout the academic year, as well as during the summer and winter, RISE Program participants are excelling academically; supporting our campus through their leadership and service; traveling to other countries to study abroad and making discoveries through research that can literally change our daily mode of operation. It is important that all those who have a vested interest in the students of the RISE Program understand the scope of the many accomplishments they experience during their matriculation at the University of Delaware.

We look forward to this newsletter serving as a vehicle to highlight our students and the many interests they have in addition to their primary goal of obtaining a degree in Engineering. Our students, along with the Graduate Counselor, Mohamed Bah have worked diligently to produce this newsletter and we hope you will enjoy the articles enclosed. We look forward to your feedback and your continued support.

Marianne Johnson ~ Academic Program Manager ~ Student Development & Support ~ RISE Program



The students and staff of the RISE Program wish to thank JPMorgan Chase for their generous support of our 2016 Student Achievement Convocation and Banquet.

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RISE NEWSLETTER Words from RISE Alumni

Candice Theodossiou



Class of 2007

Hi, my name is Candice Theodossiou and I am a Global Business Quality Manager at W.R. Grace. I graduated from the University of Delaware in 2007 with my Bachelor's of Chemical Engineering.

My first job was at BE&K (now KBR), an engineering firm, in Newark, Delaware. I had interned there during my tenure at UD and accepted a position when I graduated. However, I really wanted to work at a manufacturing plant. I got that opportunity when I received a call from W.R. Grace offering me a position in their two-year rotational program. I had interviewed with them in college but did not initially receive an offer. A year after I graduated I joined Grace's Manufacturing Leadership Program (MLP). The MLP Program took me through three unique positions in process engineering, production and Six Sigma at three different locations. When I finished I took a permanent position as a Production Engineer at our Baltimore, MD plant. I managed the day to day production and quality of alumina and chemical catalysts. In 2013, I decided to expand my skillset and I joined our corporate quality group as a Quality Engineer supporting various business within the company. A year and 1/2 later I was promoted to Quality Manager overseeing a business unit at Grace. In my current position I manage the overall processes and systems that drive quality compliance within our 3 manufacturing sites as well as our tollers.

At UD, I was actively involved in many organizations including NSBE, the Caribbean Student Association and was a founding member of Alpha Omega Epsilon (Engineering and Technical Sorority). I contribute much of my success at UD to the support of the RISE Program and the amazing lifelong friends that I made at RISE's pre-freshman summer program. The emotional and financial support provided by the RISE Program helped me through the tough times you face as an engineering student. It was also through RISE that I was introduced to the Inroads program and got my first internship. To this day, I always remember the one thing that Ms. Johnson said at every monthly meeting "Never go to a meeting without a pen and paper!"

Donald Ainsworth



Class of 1998

Hi, my name is Donald Ainsworth and I'm a Senior Director of Lean Enterprise Solutions at Amtrak. My job is to make the company work more efficiently by implementing a culture of waste elimination and continuous improvement.

I received a Bachelor's Degree in Mechanical Engineering from the University of Delaware in 1998. As I look back at my time at UD, I am very grateful for the opportunity RISE provided me. The folks I met at the summer academy became my "village" and in many cases life-long friends. I have fond memories of our time working in groups, socializing, encouraging each other and also commiserating over the challenging workload. Being a part of RISE was probably the single most important factor in determining my success at the University. It especially helped with the transition from high school. I needed the support system and relied heavily on the relationships I formed to acclimate to my new environment. Good times!

After graduation, I joined Dade Behring Inc., now Siemens Healthcare Diagnostics, as a Process Engineer responsible for a three shift operation packaging medical test packs. Shortly after that I enrolled in the MBA program at the University of Maryland. Upon graduation I joined GE Healthcare where I worked for 4 years split between Milwaukee, WI and the Northwest Suburbs of Chicago, IL. I later spent six years doing Management Consulting working for Booz Allen and IBM. I left IBM in 2012 to join Amtrak, where I currently work.

RISE NEWSLETTER Words from RISE Alumni

Madupeola Fadugba



Class of 2008

Hi, my name is Madupeola Fadugba. I received my Bachelor's Degree in Chemical Engineering (`08) and my Master's in Economics (`10) from the University of Delaware. I also hold a Master's in Education from Harvard Graduate School of Education.

I currently live and purse my passion in art in Abuja, Nigeria. My work generally emerges as series, an organic and intellectual process through which my ideas continually transform. My body of work has received international attention and recognition for pioneering interactive installation, *The People's Algorithm*, produced for the National Art Competition, Nigeria, 2014. Awarded the *Outstanding Production Prize*, this participatory work responds to the Pan-African problems of unemployment, educational resources, and training. It creates an active dialogue about issues of social justice, identity, education and the use of art as a vehicle for activism.

While at the University of Delaware, I was recognized for my ability to transect disciplines, and I was commissioned to create *Beyond the Blackboard*, a permanent artwork portraying the impact of education and science on global development, which can be found displayed in Colburn Laboratory. In addition to *Beyond the Blackboard*, my work is found in over 60 private collections worldwide including: Canada, China, Nigeria, Rwanda, South Africa, Tanzania, the UK, and the United States.

At UD, I was an active member of the RISE Program, the Delaware African Student Association, and a McNair Scholar, as well as a recipient of the David Roselle Scholarship.



Artwork done by Medupeola—Beyond the Blackboard



RISE NEWSLETTER Words from RISE Alumni

Manuel Rafael Jiménez Díaz



Class of 2010

I received my Bachelor's in Chemical Engineering from the University of Delaware in 2010. The RISE Program played an integral part in my life even before I graduated high school. The reason I wanted to attend college was to earn the best degree in Chemical Engineering and soon had to decide between the No. 1 program in the US and the University of Delaware. Had it not been for the early contact and support from RISE, I would have attended a different University.

After my graduation, I was prepared to work for GSK in PA, but I was recruited to go to upstate NY and be part of a lab as a graduate student at the Rensselaer Polytechnic Institute (RPI) in upstate NY. Soon after joining RPI, I was granted an international fellowship (CONACyT) that supplemented my support for 4 years of my doctorate at RPI and was able to get my doctorate in Chemical and Biological Engineering. Now I am part of a consulting firm in Houston, TX for petrochemical and chemical companies and am excited to start a new phase in my life.

The University of Delaware was the best experience I could have asked for. While at UD, I was able to manage a demanding Chemical Engineering curriculum while being able to carry extensive undergraduate research, being an active member of the rowing team, and several other organizations such as the Minority Student Network (MSN), and the Society of Hispanic Professional Engineers (SHPE). RISE gave me a lot of feedback into how to better manage my time at UD early in my college track. I owe a lot of my success at UD to the initial meetings I had at RISE where I got invaluable help and advice. I also remember the academic and professional mentors I met through the programs sponsored by RISE that largely shaped the path in my career.

My advice to future and current students at the University of Delaware is to never be afraid to do as many activities as possible and be exposed to anything that you find interesting. You will be surprised with how many things you can tackle with a little time management and prioritization. There are many resources at UD to aid you; do look for them even when you are doing well.

Souleymane Bah



Class of 2012

My name is Souleymane Bah. I graduated from the University of Delaware with my Bachelor's in Electrical Engineering, in 2012. While at the University, I was an active member of the Delaware African Student Association (DASA) and the National Society of Black Engineers, (NSBE) where I was the Web Master. I was the Vice President of the Institute of Electrical and Electronics Engineers (IEEE), my junior year. After graduating, I took some courses to improve my coding skills and have been working as a Web Developer since. I spent over a year in Montgomery, AL working for the Department of Transportation on an application to replace all their legacy software. I am currently working for USPS in St. Louis, MO on their retail services software. From my professional experience, I have realized the importance of teamwork which was instilled in me from being a RISE member.

As an engineering student, you are told to expect that many of your classmates you started with may not be there at the end. However, being part of the RISE Program my peers and I beat those odds by working together and keeping each other motivated. As a Web Developer, those same rules have helped me prosper by being able to communicate effectively with my coworkers and helping new hires as my RISE mentors helped me.

RISE NEWSLETTER Senior Article

My Experience at the UD as an **Electrical Engineering Student**

Ashley Johnson



In a few days I will be graduating from the University of Delaware. That's a scary thought. I can't believe how fast the time has gone by. I started out as an Engineering Undeclared student because I wasn't exactly sure what I wanted to do. I soon found out that spring semester freshman year I had to choose one of the engineering disciplines, so I narrowed it down to what I thought I would enjoy most and just decided to pick one. Electrical Engineering turned out to be the major for me. Throughout these past four years I have learned a ton and grown so much. It wasn't always easy: making it through four years of college in an engineering degree is a lot of hard work, but in the end it's worth it.

I've learned about differential equations, circuits, and electromagnetics, but I also learned other important skills that will help me in life as an engineer, such as time management, teamwork, problem solving, and determination. Here are a few key points of advice that may help the underclassmen that are still trying to figure everything out:

- Go to class even if you're not paying full attention you're still learning more than if you weren't there
- Apply for scholarships you'll be surprised how much money you can win
- Find smart classmates to study with sometimes you learn more from your study partners than you do from your professor
- Get sleep it's much harder to focus and get your work done when you're running on no sleep
- Don't procrastinate makes life way less stressful
- Believe in yourself/confidence we are all smart people. If you're struggling put your mind to it and you can succeed
- Get involved take advantage of what the

of the best memories of your life

Have fun – all work and no fun isn't the best after graduating. combination, find your perfect balance between schoolwork and activities

When I first started at UD I made a goal to get involved. Freshman year I decided it would be beneficial to do something outside of my comfort zone, so I participated in the Miss Black and Gold Pageant. This was a great experience: I made new friends, gained confidence, and won a trophy for Miss Congeniality. I continued to stay involved each year. I became the Membership Chair for the National Society of Black Engineers (NSBE) sophomore year, and the Community Service Chair for NSBE junior year. I am a math tutor for the Academic Enrichment Center and have tutored a variety of students, from freshmen to Ph.D. candidate, and learned how to work with different types of people. I enjoy tutoring because I am able to help others and encourage them to work hard and feel confident in their schoolwork. I was also a mentor for the Each One Reach One Program and the First Year Seminar Program, both designed to help freshman acclimate to college life throughout their first year. Last year I was inducted into Eta Kappa Nu Electrical and Computer Engineering Honor Society, which is an honor reserved for students in the top 25% of the class. Currently I am the Vice President of this honor society. I am also the treasurer of the Lambda Gamma Chapter of Alpha Kappa Alpha Once I graduate I plan on staying at the University Sorority, Inc. As a member of Alpha Kappa Alpha Sorority, Inc., I also participate in community service events, and help plan and execute programs. My involvement in each of these organizations and activities has helped shape who I am today, improving my leadership skills, and introducing me to different groups of people.

It's also important to gain some experience doing internships. Over the summer after junior year I had an internship at PPL Electric Utilities in the Transmission Planning Department. My main task was to create contingency files according to new NERC TPL Standards. I wrote contingencies for the bulk power, which is the interconnected system of generation and transmission for the Lancaster region. At PPL Electric Utilities I learned how to read one-line diagrams, write contingency files, and was able to tour both distribution and transmission substations, and tour the control center. After finishing my internship I was asked to return the next summer in the department of my choice. While I enjoyed the experience, I declined the offer because I wanted to try something new. My suggestion to my fellow engineering students is to start looking for internships and jobs early. It eliminates the stress of last minute applications and the uncertainty of not having something to do over the summer or once you graduate. In-

University has to offer. You may make some ternships are helpful because they give you real world experience of what you could possibly do

> Also, while at the University of Delaware I've gotten the chance to do research. I work with Dr. Willett Kempton on his unique Vehicle to Grid demonstration project, the first of its kind, which is used for charging/discharging the vehicle battery to keep the electric grid stable. We have a fleet of about twenty electric vehicles that are capable of vehicle to grid services. My partner and I monitor this fleet 24/7 and make predictions to submit bids on power capacity. We reset the cars and clear the errors so that they will be back online and be able to contribute to the power capacity for regulation up and down. We also analyze the trends of this system to ensure that everything functions well. Dr. Kempton is expanding similar programs globally. He recently set up one in Amsterdam and asked my partner and I to monitor this as well. A few months ago I participated in a presentation to visitors from Japan who were interested in learning about this research and technology. It's exciting to be working on a project that can change the way people view electric vehicles and the power system. Research was never something I thought I would be interested in, but I'm glad to have the opportunity to work on this project. I would suggest that if you get a chance to do research, take the opportunity.

> of Delaware to get my Master's in Electrical and Computer Engineering. I was accepted into the MSECE 4+1 Program. I'm excited to be continuing school, but there are a few things I will miss about being an undergraduate. I think what I will miss the most about college are the friendships I have made throughout the years. It all began in the Summer Enrichment Program (SEP) where I met many students who I am still friends with today. It's crazy to think back to how much has changed since my freshman year. Not only have I grown, but so has the UD campus. When I first started, Rodney dorm/dining hall, Gilbert and Redding, and the Harker ISE lab weren't here, and the Trabant lounge, Perkins, and the gym weren't remodeled. "Life is a learning process, and changes can be wonderful opportunities for growth. Don't be afraid of change! Embrace it and grow!" -Nishan Panwar. Continue to be great, work hard, and succeed!

RISE NEWSLETTER Senior Article

"The Misconception About

Being Busy"

Adam Engelson



we are, beyond the limits of our resumes. You don't have to be a college student to know that there are never enough hours in the day. The 8 hour work day was introduced with the purpose of ensuring a healthy lifestyle consisting of 8 hours of work, 8 hours of leisure, and 8 hours of sleep. Consider for a moment if your body only needed 4 hours of sleep per night. How would you spend those extra 4 hours? Would you learn a new hobby? Exercise more? Reconnect with friends and family? Work to improve your financial situation? Pursue a life-long dream? Relax?

Our free time, in any quantity, has a powerful influence in our lives, but it is often underestimated or overlooked. There is no wrong way to use free time, except to not use it at all. Our obligations demand that we sacrifice portions of our free time in different ways to maintain a particular lifestyle. Sometimes the pressures of our lives can paralyze us and steal what free time we have with physical exhaustion and fatigue, as well as stress and depression. For example, if you had a 16 credit hour course load, studied for an extra one hour per credit, worked 20 hours per week, exercised daily for one hour, and slept for 8 hours every night, then you would have about 54 hours of free time every week. Factor in stress, exhaustion, and the inconvenient anomalies of everyday life, and somehow your free time has slipped through the cracks of your schedule.

I entered college with the mentality that a characteristic of a successful person was having a full schedule. During my freshman and sophomore years, I participated in any opportunity that came my way. In addition to my courses, I was a RISE Program participant, the Webmaster and then Treasurer of SHPE, a member of NSCS and NSLS, and a volunteer for Deltronica. I also played intramural sports, socialized with friends, and most importantly, found a way to make work fun. Without realizing it, I had struck a perfect balance; I ter, finished working at J.P. Morgan, and decided to spent my free time doing activities that I enjoyed, pursue my own entrepreneurial venture. while preparing for my future. Entering my junior

year, I was unprepared for the changes ahead, and Just before the spring semester started, I met with learned the difference between pushing yourself and being stretched too thin.

During the summer prior to junior year, I was a Technology Analyst Intern at J.P. Morgan. Entering the fall semester, I continued to work for J.P. Morgan part time. I was elected President of the student chapter of IEEE. The fall semester of junior year for Electrical Engineering majors is particularly rigorous, and with the additional responsibilities I acquired since my sophomore year, I was in over my head. My grades started to suffer, I wasn't exercising or sleeping during the week, and my days became a congested list of things to do before tomorrow.

I knew a solution to my stress would be to cut back and allow some free time, but I let my desire to accomplish as much as possible cloud my judgement. Instead of addressing the activities that were directly causing my stress, I stopped doing things I enjoyed, thinking it would give me more time to relax and focus on my work. This decision signified the beginning of a counterproductive attempt to alleviate my stress by distracting myself with more work. This behavior prevented me from realizing what motivates me and makes me happy for a long time, and while this behavior was not healthy, it did push me to create opportunities for myself that otherwise would have gone unnoticed.

As the fall semester ended, I was interested in participating in research in signal processing and circuit design, and a professor in my department recommended me to UD's Office of Economic Innovation and Partnerships' Spin In Program, which connects students with local entrepreneurs to create innovative technologies. Beginning in January of 2015, I worked closely with Dr. Brian Pryor, CEO of Litecure, on an interdisciplinary team of engineers, graphic designers, and business analysts to invent the 'mTrigger'. mTrigger is a mobile biofeedback device that improves the efficacy of physical therapy by using electromyography to measure muscle activity.

While working on mTrigger, I continued to work part time at J.P. Morgan. I was working two more than 40 hours per week, and although my days were long, they were satisfying. I even began thinking about my projects when I wasn't at work, because I enjoyed it. I loved the startup environment, and the challenge of an unsolved problem was inspiring rather than stressful. As the winter concluded. I realized that I needed to approach the spring semester differently than I had the fall. Working with mTrigger, I felt confident and motivated to excel in other parts of my life. I continued working on mTrigger throughout the spring semes-

my friend to get dinner and we joked about inventing a machine to do the work we used to hate doing when we worked in restaurants back in high school. We suddenly realized that the idea wasn't that far-fetched, and we had the skills to do it ourselves. Since that night, we have been developing an autonomous silverware wrapping machine to improve operations and sanitation issues in the restaurant industry. Last May, we were finalists in the Johns Hopkins University Business Plan Competition, and following the competition, we formed Agoge Automation, LLC, and I assumed the role of Chief Technology Officer.

The spring semester of my junior year was even busier than the fall. When I wasn't studying, working at mTrigger, or attending to my extracurriculars, I was working hard on Agoge's next steps. While most of the time this effort was worthwhile, sometimes I worked on Agoge when I should have been studying for an upcoming exam. I made this mistake several times, and I learned there are consequences to having tunnel vision.

During the summer before my senior year, with support from RISE and a Summer Research Fellowship from the University of Delaware, I participated in research with Dr. James E. Hoffman in his Visual Cognition Lab, while still working for mTrigger and on my own startup, but I was too interested not to make time for this research. I collected and analyzed event-related potentials captured by EEG sensor arrays to identify neural bottlenecks in the competing early and late stage visual processing of emotional distractors and target awareness. It was a very challenging summer, juggling my many duties. But this prepared me for my final year at UD.

My undergraduate experiences have inspired me to apply my interdisciplinary interests and entrepreneurial motivation to begin a career in biotechnology and medical devices, exploring and expanding the biomedical applications of microelectronics and signal processing. I am a 4+1 MSECE student, and I intend on completing my Master's degree here at UD before entering the workforce, or pursuing my PhD in Electrical and Systems Engineering at the University of Pennsylvania.

It is easy to confuse being busy with being successful, and when we spend what little free time we have in college on things we are not passionate about, we are walking at graduation without purpose. While we should strive for academic success and a flourishing career, these efforts are futile if we sacrifice the pursuit of happiness for the pursuit of achievement. Success requires as much introspection as it does action, and the results of what we do is not nearly as important as the inspiration for why we do it. Whether this is your first or last vear at UD, it is never too late to make time to find what inspires you to be your best.

RISE NEWSLETTER RISE Student Activities



RISE NEWSLETTER RISE Student Activities



RISE NEWSLETTER Meet Your RSAC Members

Zachary Sheffield, Senior **Chemical and Biomolecular** Engineering



I've been a part of RISE for about 5 years, joining the summer before my Freshmen year, and a part of the RISE Student Advisory Council for roughly 3 years. When I first joined RSAC, I saw it as an opportunity to give back to the RISE community. I accumulated a significant amount

of what I like to think is wisdom during my time as a Chemical Engineering student, and I wanted to share that with the RISE student body in hopes of making their journey through college a bit easier. Participating in RSAC was my way of helping others, and as a result I found myself extending this role out- experience. I believe that RISE can help stuside the RISE Program. As a result, I've developed a greater sense of purpose and a so far unwavering determination to assist others in their endeavors. I'm more than grateful for the opportunity and I encourage anyone interested to participate.

Amy Nicolas, Junior Chemical and Biomolecular Engineering



This is my third year in the **RISE Program and my second** year in RSAC. When I first joined RSAC, I did not know what to expect but I was excited about doing something new. I quickly learned that RSAC is an opportunity to represent my fellow RISE members and get more in-

volved in the RISE community. I will always remember the day Mohamed asked who wanted to be a convener for RSAC at our biweekly meeting. At the time, I did not know what that would entail but I volunteered. Mohamed then informed me that I had to come up with an agenda for each meeting and conduct it. It definitely took me a few meetings before I felt comfortable conducting them. As a member of RSAC, I have been able to help with the Newsletter, the monthly workshops, as well as the annual RISE banquet. RSAC has

helped me further develop my leadership skills and the friendships that I made are a nice bonus. I would undoubtedly recommend anyone who wants to be more involved in the RISE Program to join RSAC.

Shi Johnson-Bey, Junior **Computer Science**, Neuroscience



I have been a part of the RISE Program for 3 years and have been a part of RSAC for two years. RSAC has given me a great opportunity to have an influence on my RISE

dents even more than it does now. My involvement in RSAC has given me the opportunity to voice my ideas. Aside from RISE I am the President of the Computer Animation & Game Design Club (CAGD). I enjoy designing video games and developing for virtual reality platforms. On top of CAGD, I am also the UD Microsoft Student Partner (MSP). As a MSP I lead monthly skills workshops for students.

Kierstyn Harris, Junior Chemical and Biomolecular Engineering



This is my third year as a RISE participant and I have been on RSAC for one year. Going into RSAC I was excited to be a part of the process of creating the RISE Newsletter. I knew it would be a lot of hard work. but I was willing to be a part of it. Being involved in RSAC I gained leadership experience

by being the Secretary. As the Secretary, I take meeting minutes, send out emails, and make sure everyone is up to date with our busy schedule. Working with all of my fellow RSAC members and Mohamed was an absolute pleasure and an incredible experience. I would definitely recommend RISE members to join RSAC!

Khalil Wynn, Junior **Electrical Engineering**



This is my second year as a member of RISE and my first being a part of RSAC.

Last summer when I joined RSAC, I was welcomed with opened arms. Since

joining RISE I have had nothing but success inside and out of the classroom. A few things I've learned along the way are how to build a solid brand and keeping a great rapport with my fellow colleagues and professors. The perspective I have since becoming a member of RSAC is the amount of time that goes into planning events like the RISE Study Breaks or even the Saturday RISE Workshops. Moving forward I continue to thank Ms. Johnson for her contribution not only as the Director of RISE but the effort she puts in to make sure our fellow students are up to date with events and different activities that are going on around campus. I enjoy being on the RSAC and would recommend joining RSAC to everyone.

Tobias Mazal, Sophomore Chemical and Biomolecular Engineering



I joined RISE the summer before my freshman year, and became a member of RSAC later in the fall semester. I saw joining RSAC as an opportunity to offer my thoughts

and help spread a passion for engineering as well as a chance to further immerse myself within a productive environment. As an RSAC member I've been able to play a part in putting together the RISE Newsletter and have also helped out with events such as the workshops and the end of the year banquet. I'm glad for the friendships and connections I've made through the RISE Program and I urge any eager RISE students interested in lending a helping hand for the community to come join the RISE Student Advisory Council!

RISE NEWSLETTER Student Organizations



In 1971, two Purdue undergraduate students, Edward Barnette (now deceased) and Fred Cooper approached the Dean of Engineering at Purdue University with the concept of starting the Black Society of Engineers (BSE). They wanted to establish a student organization to help improve the recruitment and retention of black engineering students. In the late 1960's, a devastating 80 percent of the black freshmen entering the engineering program dropped out. The Dean agreed to the idea and assigned the only black faculty member on staff, Arthur J. Bond, as advisor. In April 1975, BSE became the National Society of Black Engineers. NSBE has since grown from 6 to over 31,000 members and the annual meeting has blossomed into the Annual National Convention: hosting over 8,000 attendees. NSBE has over 99 active NSBE Jr. pre-college, 250 student, and 68 professional chapters. For more information on NSBE, visit us at (nsbe.org). The University of Delaware has an established chapter thanks to the Purdue pioneers in the 1970's. The University of Delaware has manifested an abundance of rich NSBE history. Our chapter has held annual events such as College 101, a survival guide for freshmen, and the annual Show & Tell Fashion Show. The show informs students what type of clothes to wear in different business settings. Ultimately, NSBE is getting bigger and bigger because the need for African Americans in STEM majors is a necessity.



The mission of The Society of Hispanic Professional Engineers (SHPE) is to change lives by empowering the Hispanic community to realize its fullest potential and to impact the world through STEM awareness, access, support, and development. This year the UD Chapter of SHPE co-hosted several JP Morgan Chase events to network and learn more about the industry. SHPE also co-hosted a dodge ball tournament with the Biomedical Engineering Society for the University of Delaware's annual Engineer's Week. The event had participation from many different engineering majors and was a fun way to kick off E-Week. In April, SHPE hosted a soccer tournament open to all of UD. The event had food, prizes, and a fun, competitive atmosphere. SHPE also hosted a site visit to Gore Capabilities Facility and learned more about this engineering company. Overall, it was a great year for SHPE with many opportunities for members to network, learn, and have fun.



The Society of Asian Scientists and Engineers (SASE) is an organization dedicated to fulfilling three pillars: provide resources for professional careers, promote diversity on campus and in the workplace, and to serve the community. SASE consists of students from all majors and ethnicities, and holds events such as company speakers, professional development workshops, and social events.

SASE started the semester with a resume workshop led by Ms. Ryan Fuller, who is the College of Engineering liaison from the Career Services Center. In October, a medical professions workshop was held to educate students on different types of medical-based careers. The 2015 National Conference was held from Oct 8-10 in Houston, TX, where members attended workshops and the largest career fair in the country for Asian American and Pacific Islanders. In November, SA-SE celebrated Spirit Week 2015 by participating in themed days such as school spirit, and cultural awareness. To end the fall semester, SASE sold finals week care packages to help students relieve stress and to introduce Asian snacks to students who are not familiar with them.



RESOURCES TO INSURE SUCCESSFUL ENGINEERS COLLEGE OF ENGINEERING • UNIVERSITY OF DELAWARE

RISE NEWSLETTER Research Highlights

CHEMICAL & BIOMOLECULAR ENGINEERING

A research group at the University of Delaware recently published their results regarding the discovery of a highly selective catalyst in the conversion of carbon dioxide to carbon monoxide in *Nature Communications*, a well-known science journal. The project was lead by Feng Jiao, and co-authored by postdoctoral fellow Qi Lu and graduate student Jonathan Rosen.

Carbon dioxide is a greenhouse gas, and as many of us know cutting back on greenhouse gas emissions has become a crucial engineering challenge in aiding the preservation of the atmosphere. Converting greenhouse gases to other compounds provides many benefits. In this case, conversion manages to reduce the carbon dioxide levels in the environment and additionally produces carbon monoxide, which may be further developed into more useful, non-toxic compounds.

The team determined that the conversion of carbon dioxide to carbon monoxide operates at 92% efficiency using a highly selective electrocatalyst. They found that a nanoporous silver electrocatalyst was 3,000 times more active than the polycrystalline form of silver which was commonly used in carbon dioxide conversion reactions. Silver itself is a good choice for this catalysis as it provides a high level of a selectivity for carbon dioxide (81%) and is relatively inexpensive. However, the exceptional reactivity of the electrocatalyst is due to its large surface area, Jiao postulates. The surface of this electrocatalyst is highly curved and 150 times larger than the polycrystalline silver. Therefore, the active sites on the catalyst require a smaller voltage, or less of a push, to surpass the activation energy barrier and promote the conversion of carbon dioxide.

The team compared their developed nanoporous silver electrocatalyst with other silver nanostructures and potential electrocatalysts and found that it held significant advantages over these alternative options. They are hopeful that the high reactivity of this catalyst helps to spur future advances in the field of greenhouse gas conversion.

MECHANICAL ENGINEERING

A research team at UD composed of Professors X. Lucas Lu, Xinqiao Jia, Joe Fox, and maxillofacial surgeon John Vorrasi recently received a grant from the Osteo Science Foundation to work on developing cartilage for the temporomandibular joint. The temporomandibular joint, or TMJ, holds together the lower part of the jaw to the skull, and is responsible for pain and discomfort in the approximately 10 million Americans who possess TMJ disorders. Lu states that the TMJ is "an important part of daily life, and it's hard to ignore when it doesn't function correctly." TMJ disorders are typically due to degenerative ability, many are pursuing tissue engineering as a viable solution for cartilage loss. However, the cartilage found within TMJ varies significantly from the structure of the cartilage found within other joints, as it is, according to

Lu, a "unique fibrous superficial layer, composed of mainly collagen fibers. To be effective, engineered cartilage will have to incorporate the structural heterogeneity displayed by this native tissue." The project is among the first to reproduce a synthetic matrix resembling the unique structure of the condylar cartilage found in TMJ, but the team is hopeful for the research to ultimately be applied clinically.

MATERIALS SCIENCE AND ENGINEERING

In the quest to increase the density of data that can be stored within a given amount of space, nanoparticles has become very attractive due to their increased size to volume ratio in comparison to the bulk and thin film materials currently used to make hard drives. As materials size is decreased to nanoscale, a thousand times smaller than one single strand of hair, their magnetic behavior becomes structurally different to their bulk counterpart. One very import aspect of this size decrease is the energy required to reverse the magnetization over the energy barrier from one stable magnetic configuration to the other - this energy is known as anisotropy energy (E_a). E_a is also inversely related to the thermal energy k_BT , where k_B is the Boltzmann constant and T is temperature. Therefore decrease in particle size/volume, in the pursuit of higher density capacity leads to lower temperatures at which the thermal energy can over take anisotropy energy. The onset temperature at which thermal energy over takes anisotropy energy is called the blocking temperature (T_B) . Therefore, T_B becomes a very important parameter when it comes to choosing materials to be used in high density magnetic storage.

Ways to increase the TB of nanoparticles has been subject to intense research, in recent years, as well as the research focus of Mohamed Bah. Bah, a fifth year graduate student in the Materials Science and Engineering Program, is the Graduate Counselor for the RISE Program. Mohamed and his collaborators have recently published work in Applied Surface Science, titled "Surfaces and their effect on the magnetic properties of polycrystalline hollow γ -Mn₂O₃ and MnO nanoparticles". In their work, they showed how manipulating the morphologies of nanoparticles made of novel oxides can increase these parameters and make these nanoparticles good candidates for high density data storage.



2015-2016

RISE NEWSLETTER

Student Internship Spotlight

Jessica Wong

This summer, I worked at the Delaware Department of Transportation (DelDOT) as an Environmental Studies Intern. It was my first venture into working for the government and gave me a glimpse into all of the environmental aspects of the work that DelDOT does. When most people think of what the DOT does, they think of roads and construction; which is correct. But a lot of people don't think about what goes into building a new road or a bridge. The section that I worked for handled work such as natural resources, historical preservation, and environmental compliance. There are a lot of rules that go into protecting the environment surrounding Delaware's roads, such as preserving wetlands, and identifying endangered species.

I was able to experience things that I would have never been able



to do on campus. I strapped on hip length boots and got into the streams underneath bridges to map out where they were for construction projects. I learned about all of the different types of plants and trees, as well as how to read a map. I also learned how to measure across a stream, which gave me a leg up in an assignment for one of my classes.

One of the most unexpected trips I took was to the I-495 bridge, where in 2014, was closed for construction due to unstable support columns. It had been nearly a year since then, and I was able to observe the site and check up on the status of the area and the repairs. It was interesting to see how parts of the Christina River had to be filled, and to see the pillars that had to be repaired. My time with the wonderful employees of DelDOT was something I would never trade. Everyone was patient and was always trying to help me learn something new. I never felt like I was left in the dark about any projects. The staff in the Environmental Studies section even threw a birthday party for me, which was so sweet and made me feel incredibly lucky to be there. I have only good things to say about my internship there and would recommend that students should look into working for the government at any level.

Student Professional Development

Evan Carson

Over spring break I attended my first National Convention for NSBE in Boston, MA. During my stay I got the most memorable experiences out of the career fair, meeting new people, and bonding with the members in my NSBE chapter.

Boston truly opened my eyes up and exposed me to how many people are involved in the National Society of Black Engineers. With over 9,000 registrants and over 200 companies present at the career fair I was able to do a lot of networking with my peers and potential employers. Some companies that I had the privilege to make connections with included Facebook, DuPont, Toyota, Caterpillar, and Turner Construction. One my most memorable experiences was being able to leave the Convention Center and go on a tour with Turner Construction to one of their sites in Boston. While touring we were educated on the process that Turner undergoes in order to create its buildings, problems that they run into, and the innovation that they use in order to overcome those problems. The National Convention exposed us to different people and chapters from all over the United States. Upon conversing with them I was able to get insight on how to get and retain members from the larger chapters, with ideas such as offering free registration for freshman to attend conventions and member of the month prizes for the general body. As well as methods passed down from smaller chapters, including how to obtain more allocations and fundraisers to bring in more money.

While in Boston, my favorite times were spent bonding with everyone who came to the National Convention in our chapter. As a group of people we were always cordial but our extended time together brought us closer as an organization. Together we stayed up late talking about each other's dreams, plans for the future, making us closer than we have ever been. Since our time in Boston, our board has become more family like and more willing to work with one another. The trip to the convention was a success and hopefully will prove to help our chapter improve in the next coming years.



RISE NEWSLETTER Student Interview

Monique Michalec



How was your first semester of college? A: More fun than it should have been.

What campus activities/clubs/intramural What campus activities do you particisports/etc. are you in? Are you involved in any extra-curricular activities on campus?

A: I am the treasurer of SHPE, the Public Relations Chair of SWE, a Beauty Team member for UDress magazine, and a member of Alpha Sigma Alpha Sorority.

What inspired you to have an engineering major?

A: I've always been good at math and science and had a passion for makeup but I didn't want to just be a cosmetologist. I decided that I wanted to become a cosmetic chemist and make makeup. I chose Chemical Engineering as my major over Chemistry so that I'd have more jobs and opportunities after graduation.

What advice would you give to an incoming freshman?

A: Office hours are the best thing ever! Go to them, especially TA office hours!

What do you enjoy most about being an engineering student?

A: The look on people's faces when I tell them that I'm an engineering student.

Tell us about your experience with the neer? **RISE Program?**

ment. RISE also provides very helpful career building information and advice, such as career fairs, symposiums, and workshops, along an engineer. with a wonderful support system. The tutoring provided by RISE is also very helpful. The In your opinion, what personal qualities RISE Program has been very beneficial for me.

Why did you choose UD?

Engineering programs in the nation so ethic. that's one of the biggest reasons I chose it. It's also close to home and I liked the How did you find out about the RISE Proatmosphere.

pate in for fun?

A: Being in a sorority is super fun and a How has the RISE Program helped you in nice distraction from the intensity of my your process of becoming an engineer? major. Being on the beauty team of UDress is very fun for me too and allows me to do something that I'm passionate to help guide me. The older members of about.

How have you changed since your freshman year?

A: I definitely go out less and study How do you feel about your major so more. I take advantage of the resources far? available to me more and I've gained weight.

What are your goals when you graduate?

A: I'd like to get a job right out of college at a cosmetics company and then pursue my dream of starting my own cosmetics line. I'd also like to travel the world and start a family.

Where's your favorite place to do homework on campus? Why?

A: Perkins because it has Dunkin Donuts.

How has your experience at UD impacted your decision in becoming an engi-

A: Being a Chemical Engineering student at A: RISE has allowed me to make great friends UD has made me consider changing my major and to really be able to connect with other all the time. It has challenged me greatly and minorities within the engineering depart- made me doubt myself many times but I know that if I can graduate this program, I can do anything and be successful in my career as

should a student possess to be a successful engineering student?

A: Organization skills, time management A: UD has one of the top ten Chemical skills, DETERMINATION, and a good work

gram?

A: The RISE Program reached out to me when I got accepted into UD.

A: I would fail everything without tutoring and the people I've met through RISE RISE really help me out by giving me old exams and letting me borrow their textbooks.

A: It's not the most fun and it's very difficult, but it'll be worth it.



RISE NEWSLETTER Student Interview

Mohamed Seck



How was your first semester of college?

A: It was not too bad. It is definitely a new experience, especially since I thought that it would be easy. I learned how to organize my time a little bit, especially since my Chemistry and Computer Science classes would take up a lot of time. I ended up getting decent grades as well. Overall, the first semester was a good learning experience.

What campus activities/clubs/intramural sports/ etc. are you in? / Are you involved in any extracurricular activities on campus?

A: I participated in intramural soccer for two teams; one for a top tier men's league, and another for a co-ed league.

What inspired you to have an engineering major?

A: Honestly, at first I said to myself that since I am good at Math, Chemistry, and Physics, why not do Chemical Engineering. However, my parents would sit down with me and we would list the things that I was good at, or enjoyed, and Chemical Engineering was the end-result.

What advice would you give to an incoming freshman?

A: Many freshmen, including myself, have learned tricks the hard way. The first tip is to always do work either on time or ahead of time; to many professors, late work is almost always worthless work.

What do you enjoy most about being an engineering student?

A: I do in fact find the subject, although hard, pretty intriguing and the feeling after you solved an incredibly difficult problem is a very good one. I also enjoy meeting different kinds of people in my major; some I have become good friends with.

Tell us about your experience with the RISE Pro- will not bore me. gram?

anywhere else; for instance I had never heard of student? anyone talking about the National Society of Black A: In my opinion, an engineer needs to have good to us.

Why did you choose UD?

from home. But then I realized, I'm going to meet people that make UD feel like my home; also it has one of the best Chemical Engineering programs in the country. Likewise, I did like how UD was both small enough for me to walk to everything and had beautiful grass and buildings everywhere.

What campus activities do you participate in for fun?

A: I do go to random meetings and movie nights for different things. I also get the chance to listen to a few guest speakers now and then. I also enjoy playing soccer and working out at the gym on my spare time. Just because I have a tough major does not mean that I cannot have fun.

How have you changed since your freshman year? A: I have definitely become more responsible, due to time management, and wiser when it came to decisions that could have greater effects on me. and get them help when they need it. In a way, you can say that I have truly matured.

Where's your favorite place to do homework on process of becoming an engineer? campus? Why?

alone. However, I then began going to the ISE Lab college with the opportunities of extra-help and to work with groups; I learned that working in the different upper-classmen engineering students groups is beneficial because if you are stuck on a problem, who are you going to ask? The ISE lab has a quiet environment and plenty of space for people to work in. For me, it's better than being in a cramped room by yourself.

How has your experience at UD impacted your decision in becoming an engineer?

A: If anything, I strengthened my resolve to become an engineer. When I was in high school, I all the way through. was not too sure what an engineer did; I just remember saying that since I was good at Math and Science that I should become an engineer. However, the engineering classes at UD are very challenging and solving the problems that the professors give you is necessary for you to become an engineer. I enjoy the challenge of having to solve problems, most of the time, and it makes me more excited to know that I will be doing something that

A: RISE has exposed me to different clubs and In your opinion, what personal gualities should a opportunities that I would not have heard from student possess to be a successful engineering

Engineers until RISE brought it to my attention. people and communication skills. I say this be-Also, RISE makes us aware of the different intern- cause for the most part, engineers will be working ships and research opportunities that are available in groups in order to complete projects; you have to get your group members to like you if you want things to go smoothly. Also, good communication skills are key in that you may have to explain a A: At first I didn't like UD because it was a bit far certain process to a non-engineer; getting ideas across would also be key in the workplace.

Why Chemical Engineering?

A: I did well in and enjoyed both Chemistry and Physics since my sophomore year in high school. I found a description of Chemical Engineering online and it piqued my interest. Also, my parents helped in actually finding that Chemical Engineering was a good field for me in that it is compatible with my personality and expertise.

How has your experience with the RISE Program been?

A: I have not had any negative experiences with RISE. I have gotten to meet a lot of intelligent and kind people. The fact that they force you to have monthly Personal Sessions helps a lot as well because they keep track of how students are doing

How has the RISE Program helped you in your

A: At first I did homework in my room, usually A: The program has helped me progress through that I can contact.

How do you feel about your major so far?

A: At first I was a bit flustered about engineering after the first few classes of Introduction to Chemical Engineering, but I grew accustomed to the problems handed to us. Even though it is in fact one of the toughest majors one can have, I feel good about it and am confident that I will make it



RISE NEWSLETTER Taking up the Challenge

Eriq Gloria



Army R.O.T.C. is a program in college that allows students to get their degree as well as become an officer in the United States Army. This is my second year in the program. I felt like I didn't contribute enough last year, so I decided to do a little extra this year. I signed up and tried out for Ranger Challenge. Ranger Challenge is a country-wide competition that is broken up into 8 brigades. The University of Delaware is in the 4th Brigade along with 41 other schools in this region. The competition is held at Fort Pickett, Virginia in the middle of October.

The very first day after we came back from summer break, we had to try out for the team. 11 of us made it, out of 20 people who tried out for the team. Tryouts were a week long and it tested our physical ability. A senior cadet ran the team, and he wanted to see how well we kept in shape over the summer. 9 out of the 11 people on the team were on it last year. I was 1 of 2 that were new. At the 2014 competition, UD placed 26 out of 42 teams. We weren't just trying to improve from the year before, we were trying to come in first and it showed by how hard we worked. Practices were 5 days a week and they started at 5 a.m. We did a variety of workouts such as ruck runs which is running with a large backpack on with about 35 to 40 pounds of weight in it; hill workouts at the Newark Reservoir, long distance runs, tactics training, and shooting. We all had our days where we weren't feeling well or we didn't get enough sleep and there was always another teammate who was willing to pick up the slack.



Time for the competition finally came around and cally and mentally tough because we were going we were ready to go. Each of us knew what we to be rucking for 35 miles with about 40 to 45 had to do in order to win. The competition start- pounds on our back. We did a lot of hill workouts ed at 6 a.m. and didn't end until 7 p.m. Needless and ruck runs because West Point is in the mounto say, we were all exhausted. We felt confident tains. We would even have tactics classes after in how we performed just by the feedback we practice in order to nail down our jobs. We came received from the graders, but we were skeptical back from spring break a couple days early in orabout first place since UD has never won before. der to head to West Point. We stayed there for a After all the points were tallied, we ended up plac- week before we actually competed. It was cool to ing first by 5 points. We were in shock. We could- get to meet other cadets, but also to see cadets n't believe that we moved up 25 places in just one from other countries. Some of the guys and girls year. Since we won, we were moving on to a from other countries weren't even in college. world-wide competition at The United States Military Academy, West Point. It's called Sandhurst.



Sandhurst is a military academy in England. In the This competition was a 2-day event. The first day Chile, Mexico, and England.



This was a whole new experience for everyone. We knew we were going to have to work harder than we did in the fall in order to make our mark. We would practice 5 days a week and get up as early as 4 a.m. sometimes. Sometimes we would even practice on Saturday. We had to get physi-

They were 25 and older and had a lot more experience than we did.



1950s, Sandhurst requested West Point hold an we rucked 24 miles and the second day we rucked international competition that would allow coun- 11 miles. In between, we had to sleep outside and tries to compete on the same battlefield. It was to temperatures reached as low as 20 degrees that build comradery not only with your team, but with night. By the end of the first day, we all had blisother American teams and other countries. To- ters on our feet, our legs were cramping, and we day, the Sandhurst competition at West Point is were tired and hungry. We started on a Friday at the biggest military competition in the world. This 10 a.m. and finished the next day at 11:30 a.m. year, there were 36 West Point teams; 8 R.O.T.C. We were so happy that it was over, but we had no teams, one from each brigade; one team from the idea how we did. That night, there was an awards Coast Guard Academy, one from the Naval Acade- ceremony that announced each team's place. We my, one from the Air Force Academy; and 9 inter- ended up coming in 19th out of 60 teams overall national teams. The international teams were and 3rd out of 8 R.O.T.C. teams. We were more China, Canada, Latvia, Germany, Korea, Japan, than happy with our performance. It was all due to the fact that we trained with each other for 7 months straight. We knew what motivated each other, what aggravated each other, how to pick someone up on an off day, how to effectively communicate with each other. It was truly a great experience and I thank all the guys and girls on the team who pushed me when I didn't think I could go anymore.

