Recycling a Precious Resource - Helium!

The Department of Chemistry and Biochemistry installed on May 14th a liquid helium recovery system costing a bit more than $250,000. But since the department currently spends about $40,000 a year for liquid helium, this investment should very quickly be paid back. While a 15% ROI isn’t bad at all, as a further incentive, liquid helium supplies have been very tight and volatile for some time. Last summer, for example, the Saudi embargo of Qatar, which produces 25% of the world supply of helium, caused major price jumps and supply disruptions. The department never ran out, but we were rationed. Scientific use is lower in priority than medical uses and usage by semiconductor manufacturing, so if things get really bad we are right behind party balloons as the first to be cut off. Supply shortages also hit in 2006 and 2011. The Bureau of Land Management operates the National Helium Reserve in Amarillo, but that is expected to be depleted by 2020. The ability to capture and re-liquefy most of our helium should help buffer us from similar supply problems in the future.

In the top right picture, John Ketcham, the engineer from equipment supplier Cryomech, explains the operation of the newly installed helium recovery unit to department Master Scientific Research Technicians (L to R) David Parette, Kz Shein, and Zay Lynn. In the picture below left, you can see one of the heat exchangers and copper piping used by the system to collect and warm the helium boiling off from the superconducting magnets of our NMRs. The gas flows at just above atmospheric pressure into the large rubber bag in the foreground. It can inflate up to six feet tall. The compressor that Kz has his hand resting on in the first picture is across the hall from the NMR room and it compresses the helium into the medium pressure storage tanks visible in the background behind Kz and Zay. This gas is then passed through a purifying cold trap, on the left in the second picture, where water, oxygen, nitrogen, and any other contaminates are frozen out. In normal operation it will not frost over on the top as it is doing under the start-up conditions when this picture was taken. The pure helium is then chilled to 4°K, just above absolute zero, and condensed in the unit on the right in the second picture. It is then transferred to conventional Dewars (not shown) and used to refill the superconducting magnets.

And, by the way, don’t worry, the big black bag is heavy enough it won’t float away!
Faculty News

On the Go


Honors and Awards

M. Hassan Beyzavi has received funding on his first proposal submitted. A phase I SBIR proposal, entitled “Covalent Organic Frameworks (COF)-based Nanoporous Structures for Explosive Remediation” has been funded by the Army Research Office. Beyzavi wrote the proposal but is acting as a subawardee and contracting with CatalyzeH2O, LLC startup company in Fayetteville, which was founded by Shelby Foster, a former student of Lauren Greenlee in Chemical Engineering. This will pay for a post-doc in Beyzavi’s lab to do the work. Hopefully, they will get good results and advance to phase II.

The Board of Trustees confirmed the promotion of Feng Wang to full professor at the August meeting.

Susanne Striegl er was selected to receive the 2018 Group II Fulbright College Master Teaching award, which was presented at the Spring College Faculty Meeting April 5, 2018.

Publications


Mahmoud Moradi was one of nine awarded access to Blue Waters through Great Lake Consortium for Petascale Computation (GLCPC). Blue Waters is the fastest supercomputer at a university anywhere in the world. He received 576,000 node-hours (over 18 million core-hour equivalent), which is the second largest award among the 9 GLCOC awardees. Blue Waters supercomputer is located at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign. Moradi’s project is entitled “Thermodynamic Characterization of Conformational Landscape in Proton-Coupled Oligopeptide Transporters.”

Amberly Vaughan, honors undergraduate student, won first place for her oral presentation at the 102nd Annual Meeting of Arkansas Science Academy April 7-8, 2018, Arkansas State University, Jonesboro, AR. She is a student in the Kumar lab.

Gray Orman and Pooja Lukhi both were named as the finalists of the Razorback Classics of Class 2018 by the U of A Alumni Association.

Suresh Kumar Thallapuranam received the Charles and Nadine Baum Faculty Teaching Award from the Alumni Association for 2018.

Chenguang Fan was awarded a 2018 Ralph E. Powe Junior Faculty Enhancement Award, which is sponsored by ORAU (Oak Ridge Associated Universities). ORAU is a consortium of major Ph.D.-granting academic institutions which cultivates collaborative partnerships that enhance the scientific research and education enterprise of our nation. The Ralph E. Powe Junior Faculty Enhancement Award provides seed money for research by junior faculty at ORAU member institutions. These awards are intended to enrich the research and professional growth of young faculty and result in new funding opportunities. The award provided by ORAU is $5,000. The awardee’s institution is required to match the award with at least an additional $5,000. It is a one-year grant.
From the Chair ~ Wesley Stites

Elsewhere we tell you about our brand new helium recovery unit. This is an investment that will save us a lot of money in the future, but I want here to talk about another investment that the University has made for years that saves us lots and lots of money and enables us to do many things we couldn’t otherwise; including installing and operating a helium recovery unit. In one of the pictures are our three Master Scientific Research Technicians: Kz Shein, David Parrette, and Zay Lynn. These three are some of the best money the University spends each year. They are simply amazing. Their ability to fix just about anything astounds me. They developed the specifications for the new helium system, designed the plumbing, supervised the installation and commissioning and will be responsible for its maintenance and operation. Without them, we couldn’t hope to keep our millions of dollars of equipment running unless we spent hundreds of thousands on service calls every year. Helping to design and construct sophisticated new instruments? No problem. Helping to unload trucks in the freezing cold or searing heat? No complaints. Working on weekends, holidays, and even nights to keep magnets filled with helium, cope with power failures, or other problems? No worries. No job is beyond them or beneath them and we know we can count on them to do things efficiently, properly and without any real need to supervise them. Set goals and stand back out of the way!

Zay, David, and Kz: We don’t say it often enough. Thank you for all you do and how much better you make us. Well done yet again!

REU / INBRE Summer Research Program

The 29th year for summer undergraduate research programs is underway for the department. Dr. David Paul and Dr. Julie Stenken are the program co-directors, and Dr. Roger Koepppe helps coordinate the INBRE portion as the director of the Science Research Core. This year, we are hosting 15 students on the UA campus in Fayetteville (3 INBRE; 12 REU), and an additional 13 INBRE students on the campus of UAMS.
Research Demonstrates New Approach to Study Properties of Nanodroplets

Researchers have found new methods to measure the internal pressure and surface tension of nano-sized drops of liquid like those involved in cloud formation and airborne pollutants to study how they behave in different environments. Understanding the function of these droplets in cloud formation is relevant to the study of climate change. Similarly, airborne pollutants can also come in the form of nanodroplets. Nanosized drops of liquid are also used in labs to act as nanoscale “reactors”—tiny containers to house chemical reactions at high concentration. In order to understand how nanodroplets behave in each of these contexts, a researcher must be able to measure properties such as internal pressure and surface tension.

New research conducted by Feng Wang, U of A associate professor of physical chemistry, along with graduate student Kai-Yang Leong, has found methods to calculate these properties. The research, funded by the National Science Foundation, was published in the Journal of Chemical Physics.

Wang explained that, because nanoscale droplets are highly curved, their surface tension cannot be calculated in the same way as the surface tension of liquid with a flat surface. These tiny droplets are also difficult to study because they evaporate quickly.

“A conclusive understanding regarding the surface tension of nanodroplets is far from being achieved,” the researchers said in their paper.

In order to find the surface tension, researchers must know the internal pressure of the droplet. Established methods of calculating pressure in liquids use a measurement called virial pressure, which uses force and distance to calculate pressure. These methods work well for large amounts of liquid but not for small droplets, where minor changes in distance have a more pronounced effect.

Wang and Leong used the U of A High Performance Computing Center to develop a new method of calculating the internal pressure of a nanodroplet. Using a type of computer modeling called molecular dynamics simulation, the researchers were able to calculate the internal pressure of nanodroplets by first establishing the relationship between the density and the pressure of the droplets. Since the density of the water could be established, the researchers could then use this as a proxy to calculate the pressure.

Chemists Develop Improved Method to Create Artificial Photosynthesis

A team of chemistry and chemical engineering researchers at the University of Arkansas has developed a method of creating materials for artificial photosynthesis that is more efficient and cost-effective than current methods.

Plants use photosynthesis to convert sunlight into chemical energy, which they store in the form of sugars or fatty acids. A device known as an artificial leaf mimics this natural process, providing a reliable, economical and sustainable source of storable chemical fuels, such as hydrogen.

Artificial photosynthesis has an advantage over traditional photovoltaics, which produce electricity only when the sun is shining. An artificial leaf stores the energy from sunlight as chemical bonds which can be used to generate power at any time, matching the advantage of that coal and natural gas have over photovoltaics.

Currently, materials for artificial photosynthesis devices are expensive to produce because they must integrate all of the components that carry out the necessary light absorption, chemical catalysis, and other processes, and each of these components must be assembled on the nanoscale.

“Typical nanostructured materials for these applications use the same expensive and energy-consuming fabrication methods that are used to build microprocessors,” explained Robert Coridan, assistant professor of chemistry and biochemistry. Coridan worked with Mya Norman, an instructor in chemistry and biochemistry; Walker Perez, who recently earned a bachelor’s degree in chemical engineering; and Chandler Kline, an undergraduate chemical engineering student.

This research team used a method called atomic layer deposition to build nanostructures one atomic layer at a time. They deposited layers of zinc oxide onto a mixture of glass and polymer nanospheres. Once the structure was complete, the researchers could dissolve the polymer, leaving a network of zinc oxide-coated glass spheres and hollow pores. This structure contains all the elements necessary to act as a photoanode, the part of an artificial leaf that uses light to turn water into oxygen and energy.

Coridan explained that a similar process could be used to create a photocathode, the part of an artificial leaf that takes the protons and electrons created by the photoanode and recombines them to form hydrogen, which can be stored and used as fuel. The researchers tested their patent-pending material by using a device called a potentiostat to measure the amount of energy it generated in the form of current. Their results are available through open access in the journal Advanced Functional Materials.
**Doctoral Student’s Research Aimed at Better Understanding Neurocognitive Disorders**

~Newswire April 5, 2018

**Mahsa Lotfi-Marchoubeh** pulls shoe covers onto her feet, one at a time. She puts on a face mask, followed by a bouffant cap. She gently pulls a hood over her head, so no part of her head or neck is exposed, except for her eyes. She steps into a jumpsuit, tucks the head into the collar and zips the suit up to her chin. She pulls booties over her feet, ensuring each leg of the jumpsuit is securely tucked inside. She pulls gloves onto her hands and slides safety goggles over her eyes. Now fully outfitted in her cleanroom suit, she’s ready to enter her research lab and get to work.

Lotfi-Marchoubeh must wear a suit at all times when she is in the cleanroom lab, and she cannot bring anything with her into the lab—not even her phone. The smallest speck of dirt or lint could compromise fabrication of the device essential for her research, so she must be diligent in adhering to lab standards.

A doctoral student in chemistry, Lotfi-Marchoubeh is developing a probe to measure chemicals in the brain. Developing the probe takes careful consideration and incredible attention to detail, as it not only must be small enough to enter delicate brain tissue, but also must have the complexity to perform chemical measurements.

"The size is the main consideration to avoid tissue damage," Lotfi-Marchoubeh said. "The probe has to be less than 100 micrometers thick, which is the thickness of one strand of hair. The probe also has to be the right length, so it can reach the parts of the brain we’re targeting."

Once the prototype of the probe is completed, Lotfi-Marchoubeh will travel to the University of Pittsburgh to work with collaborators there who will test the probe. In addition to making chemical measurements, the probe will also be tested for its strength upon insertion, the amount of tissue damage caused and the body’s reaction to the foreign object. The probe features nine gold electrodes, which are used to make the chemical measurements. The probe is attached to an instrument that reads electrical currents, allowing researchers to detect the chemical being measured.

"I measure dopamine, noradrenaline and adrenaline," Lotfi-Marchoubeh said. "The structures of these chemicals are very similar to each other, and their electrical current behavior is very much the same, but they play different roles in our bodies. This probe will allow us to differentiate the chemicals and determine the amounts of those chemicals in the brain."

Dopamine, noradrenaline and adrenaline are believed to be tied to depression and neurocognitive disorders. Better understanding these chemicals and how they interact in the brain could lead researchers to greater discoveries in treating these conditions.

"The most rewarding part of my research is that it might one day be used to understand depression, Parkinson’s disease and other neurocognitive diseases," Lotfi-Marchoubeh said. "The fact that we’ll be one step closer to understanding the brain is amazing. When I think of the brain, I think of the cosmos—that’s how complicated it sounds to me. It’s a little four-pound organ, but it’s incredibly complicated."

Lotfi-Marchoubeh is on track to complete her doctorate in December 2019. After graduation, she plans to stay in academia and encourage students to uncover their unknown scientific interests.

"I have a heart for teaching and helping people understand what I’m passionate about," she said. "I want to motivate younger students to find what they are passionate about and pursue those interests."

Lotfi-Marchoubeh holds a bachelor’s degree in chemistry and a master’s degree in analytical chemistry from Isfahan University of Technology in her native country of Iran. She is advised by **Ingrid Fritsch**, professor of analytical chemistry in the J. William Fulbright College of Arts and Sciences.
Honors and Majors Day

The department of chemistry and biochemistry Honors and Majors Day was held April 23, 2018 and featured research presentations by the junior and senior honors students. The list below includes the student names, project titles, and faculty mentors for the 57 projects presented.

Seniors

Armstrong, Monica. "Understanding the Role of Proline on the Structure and Stability of the Human Acidic Fibroblast Growth Factor," Suresh Kumar Thallapuranam, mentor


Canote, Cody. "Synthesis of Fluconazole Derivatives for Diversification of Antifungal Properties," Matthias McIntosh, mentor

Coleman, Ryan. "Testing the Re-usability of Defined Medium for an Effective Incorporation of Unused 15N Label into Recombinant Proteins," Suresh Kumar Thallapuranam, mentor


Frerking, Jeffrey. "Tethering Quinone to a Ruthenium Photocatalyst to Prolong Charge Separation and Increase Photocatalytic Activity," Nan Zheng, mentor

Griffin, Bryce. "Characterization of the Features of Protein, Tuberous Sclerosis Complex 2, TSC2 and a Variant D72A, through Proteolytic Digestion," Paul Adams, mentor


Kwok, Alexander. "Decorating Separator to Improve Lithium-Sulfur Battery Performance," Jie Xiao, mentor


Lipinski, Karli. "Influence of Saturation and Hydrophobic Length of Lipid Bilayers on Twin-Arginine Containing Helical Peptides," Roger Koepp, mentor

Lowe, Hannah. "Development of Anti-microbial Alginate nanofibers for Wound Healing Applications," Ryan Tian, mentor

Mantooth, Laura. "Osteogenic Activity of Strontium- and Calcium-loaded Titanium," Ryan Tian, mentor

Meeks, Attrice. "Synthesis of Fluconazole Derivatives," Matt McIntosh, mentor

Naeger, Katherine Marie. "Ring Opening of Substituted Cyclopropyl Derivatives," Nan Zheng, mentor


Orman, Gray. "The Purification of Sodium Channel Toxin from Centruroides vittatus," Suresh Kumar Thallapuranam, mentor


Roberts, Darla. "Oxidation of Peptoid through the Use of TEMPO and Bleach," Shannon Servoss / Suresh Kumar Thallapuranam, mentors

Shaw, Collie. "Proton Exchange Membranes using Polybenzimidazole Membranes/Functionalized Graphene Oxide and Various Dopants," Ryan Tian, mentor


Wright, Dylan. "Investigation of the Chaperone Activity of cpSRP43," Suresh Kumar Thallapuranam, mentor

Yehualashet, Elonay. "Models of Alpha-Synuclein Aggregation in Parkinson’s Disease," Mahmoud Moradi, mentor
Juniors

Azzun, Anthony, “The Application of Metal Organic Frameworks in Dinitrogen Reduction,” M. Hassan Beyzavi, mentor
Buckner, Emma, “Role of Membrane Composition in the Sensitivity of Yeast to Antifungal Peptides,” David McNabb, mentor
Cato, Mattison, “Colon Tumor Allograft Hypoxia in Response to Immunotherapy and Chemotherapy Treatments,” T. Muldoon, mentor
Dasgupta, Dhruba, “Synthesis of Gold Silica Dimers as Optical Tracers for Biomedical Applications,” Jingyi Chen, mentor

Denham, Chynna, “Delineating the Structural Forces Responsible for the High Stability and Enhanced Activity of FGF-1-R136EK126N Double Mutant,” Suresh Kumar Thallapuranam, mentor
Dunn, Maria, “Characterization of FGF-1 Quadruple Mutant,” Suresh Kumar Thallapuranam, mentor
Gandi, Nimit, “Characterization of Ras-Related Protein-Protein Interactions,” Paul Adams, mentor
Gattis, Brayley, “Photothermally Controlled Release of Ceftaroline Fosamil using Polydopamine-Coated Gold Nanocages,” Jingyi Chen, mentor

Hill, Larry, “Mulberry River Acidification by Sulfates Derived from Pyrite,” D. Miller, mentor
Hoggard, Victoria, “Synthesis of Fluconazole Derivatives to Increase Potency,” Matthias McIntosh, mentor

Kennedy, Clark, “Role of the Master Regulator RstA in Peptide Transport by Clostridium Difficile,” Mack Ivey, mentor
Lirgg, Scott, “Delineating the Structural Forces Responsible for the High Stability and Enhanced Activity of SuperFGF (R136ES61L),” Suresh Kumar Thallapuranam, mentor
McClanahan, Kathleen, “Design of a Novel Basic Human Fibroblast Growth Factor with Enhanced Stability and Increased Biological Activity,” Suresh Kumar Thallapuranam, mentor
Merriman, Chandler, “Modulation of Temperature Stability and Cell Proliferation Activity of SuperFGF,” Suresh Kumar Thallapuranam, mentor
Otwell, Alexandra, “Documenting the Acute and Sub-acute Sensitivity of Clinical Tools Used for the Assessment of Sport-Related Concussion,” R. Elbin, mentor
Oyibo, Stephanie, “Tailoring the Functionality of Polydopamine Coating on Nanoparticle Surface,” Jingyi Chen, mentor
Patrick, Casey, “Exploring the Heparin Binding Property of the P40 Subunit of Mouse Interleukin-12,” Suresh Kumar Thallapuranam, mentor
Raley, Robin, “Quantifying the Overexpression of Mitochondrial ROS in Rat Dermal Fibroblasts using Label-free Multiphoton Microscopy,” K. Quinn, mentor
Reber, Lemuel, “Effects of a Malabsorptive Rye Diet on Growth and Adipose Tissue in Commercial Broilers,” B. Hargis, mentor
Renfro, Zachary, “How do Temperature and Signaling Environment Affect Macrophage Cytokine Expression?” J. Durdik, mentor
Scott, Julia, “Competitive Inhibitors of Alpha-Galactosidase as Pharmacological Chaperone Therapy,” Susanne Striegler, mentor
Seeram, Mounika, “Identifying Calcium Levels in Cells During Aortic Valve Disease Progression Using Calcium Inoptix Imaging,” K. Balachandran, mentor
Sesler, Aaron, “The Effects of L-citrulline on Flow-mediated Vasodilation in Young Adults,” M. Gray, mentor
Stahman, Alleigh, “Studying the Lysine Acetylation of Isocitrate Dehydrogenase in E. coli,” Chenguang Fan, mentor
Sustich, Sara, “Detection of Helix Fraying of Transmembrane Peptide with Two Interfacial Arginine Residues,” Roger Koepp, mentor
Veluvolu, Manasa, “The Mechanism of Regulatory Variation in a Key Stress Defense Gene,” Jeffrey Lewis, mentor
Webb, James, “Enzyme-inspired Tandem Reactions with Multi-catalytic Site-isolated Functional Materials for Energy Sustainability,” M. Hassan Beyzavi, mentor
Wheeless, Amber, “Does Acetaminophen Cross-link Proteins?” Wesley Stites, mentor
Magnetohydrodynamic Research Collaboration in Germany - Foysal Z. Khan

I visited Technische Universität (TU) Ilmenau in Germany for two weeks in November 2017 and April 2018 as a part of a collaboration between the research laboratories of Professor Ingrid Fritsch and Professor Christian Cierpka. These interactions were sponsored by the Research Training Group (RTG) on Lorentz Force Velocimetry in the Technical Thermodynamics Department there. TU Ilmenau is a public research university in the German state of Thuringia, consisting of five academic departments with around 7,200 students.

As an aspiring PhD candidate in the Fritsch research group, my expertise is in developing and optimizing a novel, on-chip redox-magnetohydrodynamics (R-MHD) pumping system that is valve-less and channel-less. This technology holds promise for downsizing sample manipulations involved in chemical analysis from the benchtop to the handheld scale. Integral to this work is the discovery of materials with high charge capacity and the characterization of the R-MHD flow profiles using microscopy. Our collaborative efforts with TU Ilmenau have allowed us to enhance our existing research capabilities by measuring the flow profiles in three-dimensions, and not just the two-dimensions offered by conventional microscopy. I worked closely with Dr. Jörg König, a member of Professor Cierpka’s research group, on the three dimensional - three components (3D3C) velocity measurements using astigmatism particle tracking velocimetry (APTV), which was developed in his laboratory.

Ilmenau is situated in the valley of the river Ilm and surrounded by mountains. It’s a cozy, small, and welcoming town with numerous historical buildings and monuments. In many ways, Ilmenau is very similar to our Fayetteville. The surrounding Thuringian Forest offers many recreational opportunities, like camping, fishing, and hiking. There are a lot of hiking trails around Ilmenau to enjoy the beauty of the forest and mountains. Ilmenau is only an hour away from Erfurt, the capital of Thuringia which houses many famous churches, including the 1200-year-old St Mary’s Cathedral.

This German sponsored collaboration has offered me benefits beyond the scientific experiments and training. It has stimulated new research ideas and established professional networking with a new research group in an international setting. I am grateful to Professor Ingrid Fritsch for giving me such a valuable opportunity. I would like to thank the RTG - TU Ilmenau for the monetary support. I am also grateful to Mahsa Lotfi, Chris Mazzanti, and Taylor Snider for helping me out with my teaching responsibilities while I was away.
A chemistry canoe trip on the Buffalo National River has been taking place for more than 60 years. The chemistry canoe trip was led, starting in the 1950s, by faculty members Art and Lois Fry, Wally and Doris Cordes, and George and Betty Blyholder. These chemistry faculty were founding members of the Ozark Society, which fought to preserve the Buffalo River from being dammed, and led to the establishment of the Buffalo National River, a part of the National Park System, by an act of congress in 1972. The annual canoe trip on the Buffalo National River has been an important part of the life of the University of Arkansas Chemistry Department for more than 60 years.

Colin Heyes led the annual UA Chemistry Canoe trip on the Buffalo River on Monday, May 14, 2018. This canoe trip from Steele Creek to Kyles Landing includes the most iconic sites on the upper Buffalo River. We started at Steele Creek with a great view of Roark Bluff, and then passed Bee Bluff down to Big Bluff, where we had lunch. We saw the famous Goat Trail which cuts across Big Bluff about half way up. After lunch we canoed down to Jim Bluff, where we had a good swim. The next stop was a hike up to Hemmed-in-Hollow, which has the highest waterfall, 210 feet, between the Appalachians and the Rocky Mountains. We then encountered the biggest rapids on the Buffalo River, including Hell’s Half Acre, and the infamous Grey Rock. The water level was a bit low, and we had to get out and drag the canoes occasionally. The weather was perfect, clear and 80 degrees. We all survived!

All photos were taken by Frank Millett.
Commencement - Academic Year 2018

The 2017-2018 academic year has come to a close with 76 undergraduates and 5 graduate students graduating during the year. We offer our congratulations and best wishes to all of our graduates!

The spring undergraduate honors awardees were recognized May 11 during the Fulbright College Honors Program. Of the top four awards, three were given to chemistry majors. The Harold D. Hantz College Scholars Award, given to scholars who take most of their core courses at the honors level, meet all department requirements, and defended an honors thesis was presented to two students this year - Alexander Kwok and Pooja Lukhi. Alexander’s mentor was Jie Xiao and Pooja’s mentor was Suresh Kumar Thallapuranam. The Margaret Kirby Hantz Service Award, named in honor of the sister of Harold Hantz, is given to the student who has demonstrated outstanding commitment to the Fulbright College and the University of Arkansas. Karli Lipinski was its recipient. Karli’s mentor was Roger Koepp.

"College Scholar, ‘Departmental Scholar, *Summa cum laude, °Magna cum laude, °cum laude

Students receiving the Bachelor of Arts (BA) degree were:

- Nicholas Gregory
- Collin Mondrik
- Kori Gray
- Mauricellis Dia Diaz Garcia
- Martha Futrell
- Jessica Hesler
- John Logan Hiatt
- Charles Horton
- Merrisa Jennings
- Kaci Mack
- Joseph Massey
- Laken McClelland
- Kathryn Miller
- Caleb Smith
- Garrett Snell

Students receiving the Bachelor of Science (BS) degree were:

- Graham Cummin
- Natalie Irvin
- Cuauhtemoc Zizumbo
- Michael Crew
- Leticia Dupanbatotchou
- Therese Haiss
- Ugochukwu Odega
- Lorna Outcalt
- Brady Roberts
- Monica Armstrong
- Heather Becker
- Karime Bolivar
- Cody Burch
- Jordan Burkdoll
- Cody Canote
- Chloe Cantrell
- Oscar Chavez
- Ryan Coleman
- Anna Doner
- Devin Dupree
- Jordan Earp
- Willie Evans
- Zackary Freeman
- Jeffrey Frerking
- Lydia Ganaden
- Avery Green
- Harper Grimsley
- Jack Guo
- Hayden Hairston
- James Hardgraves
- Wayne Hawkins
- Phyllicia Hill
- Rebecca Klee
- Alexander Kwok
- Tanner Lazarus
- Pooja Lukhi
- Mary Malloy
- Laura Mantooth
- Cayley McCollough
- Attrice Meeks
- Jessica Mills
- Rebecca Moffett
- Andrew Murphy
- Katherine Naeger
- Omezikam Okolo
- Chimunya Orji
- Gray Orman
- Lindsey Parnell
- Jessica Paschal
- Austin Penney
- Julie Pennington
- Emily Petersen
- Darla Roberts
- Collie Shaw
- Bradley Smith
- Natasha Thompson
- Ryan Trouvillon
- Amberly Vaughan
- Leah Ward
- Dylan Wright

Students receiving the Doctor of Philosophy (PhD) degree were:

- Ryan Bauer
- Marlena Patrick
- Jianguo Wang
- Julie Davis Eberle
- Randy Espinal Cabrera

Left: Foysal Khan and Professor Ingrid Fritsch
Right: Nandita Halder and Professor David Paul
**Alumni News**

Evelyn and **Bill Deese** (PhD 82) welcomed their first grandbaby, Alexandra Lynn Pace, on Feb. 9, 2018. Alex was born to Joshua Pace and Nicole Deese. Parents and Baby Alex live in Batesville, Arkansas, and are all doing well. William Cullen Deese wcdeese@coes.latech.edu

Dr. **Brian Bakke** graduated from Dr. Matt McIntosh’s group with a PhD in organic chemistry in 2004. From 2004-2005, he worked as a post-doctoral research associate in the lab of Dr. Katherine Seley-Radtke at the University of Maryland, Baltimore, where he developed iso-adenosine analogues as chemotherapeutic agents. Following his post-doctoral experience, he worked for 7 years as a senior chemist in process technology groups with two multi-national companies, first with BASF, and later with Syngenta.

For the past 6 years Brian has served as Chief Science Officer for a medical services company based in Cleveland, Ohio, called xRMD. In 2016, while serving in his role as Science Officer, Brian completed a 1-year clinical nutrition program for health professionals at Columbia University Medical Center (CUMC) and the Institute of Human Nutrition (IHN) in New York City. This summer Brian will complete the requirements for a Master’s degree in Clinical Nutrition from Columbia.

Brian is in the process of starting a new company that will deliver evidenced based, personalized medicine to underserved populations in the US and abroad. The new venture will focus on using telemedicine and advanced EMR platforms to link collaborative care teams from multiple specialty areas of medicine.

Dr. **Roger Williams** (PhD 13) joined the US DOJ’s DEA in 2014, and in 2018 he reached the GS-13 level, the highest possible technical level (for those without management duty). He has been routinely training new employees in Quantico. Williams presented a department seminar April 16, 2018, which gave an overview of the forensic branch of the Drug Enforcement Administration (DEA), the duties and day-to-day operations of a forensic scientist, and the current challenges and dangers we face as a nation.

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**Students Admitted to Candidacy**

Yoshi Sakamaki

Isabelle Niyonshuti

Shilpi Agrawal

**Yoshi Sakamaki** received her B.S. from Tokyo University of Pharmacy and Life Science in the spring of 2016. She was admitted to candidacy April 27. She is a member of the Beyzavi lab.

**Isabelle Niyonshuti** received her B.S. from Spelman College in the spring of 2016. She was admitted to candidacy in May, and is a member of the Chen lab.

**Shilpi Agrawal** received her B.S. from Gujarat University and her M.S. from Vellore Institute of Technology. She was admitted to candidacy in May. She is a member of the Adams lab.
The department of chemistry and biochemistry at the University of Arkansas strives for excellence in research, teaching and service in chemistry—the central science. We aspire to positions of leadership regarding the discovery of new scientific knowledge, the training of students, and the economic development of the State of Arkansas. We seek to recruit and retain a diverse group of the best faculty, students and staff to address the challenges of the future through interdisciplinary and multidisciplinary research and education.

Excellence in the Central Science

Calendar of Events

June
1. National Donut Day
8. National Best Friend Day
14. World Blood Donor Day
17. Father’s Day
21. Summer Begins

July
4. Independence Day - University is closed
15. National Ice Cream Day
18. REU/INBRE Poster Session, 3-5 pm, Vol Walker Hall 2nd Floor Gallery
29. National Lasagna Day

Our Newest PhD

Julie Davis Eberle successfully defended her dissertation “Engineering the structure of the human acidic fibroblast growth factor to enhance its stability and cell proliferation” April 17, 2018. Her advisor is Suresh Kumar Thallapuranam.

Library Hours

Spring Semester Hours: January 16-May 12
Saturday-Sunday: CLOSED
Monday - Thursday: 8:00 am - 9:00 pm
Friday: 8:00 am - 6:00 pm

Exceptions to Regular Spring Hours
Friday: May 11
8:00 am - 5:00 PM

Intersession Hours: May 13-28
Monday-Friday: 8:00 am - 5:00 pm
Saturday-Sunday: CLOSED
Monday: May 28 (Memorial Day): CLOSED

The chemistry and biochemistry library resources can be accessed in the following LibGuides: http://uark.libguides.com/content.php?pid=110953. Please bookmark for future use.
Theses and dissertation resources can be found on the following LibGuide: http://uark.libguides.com/content.php?pid=123035 &sid=1057466.

For more information: Check the Libraries’ web site (http://libinfo.uark.edu) for updated information on hours and services. Library hours are also available by dialing 479-575-2557.