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Department of Chemistry and Fermentation Sciences

THE PERIODIC TIMES

STUDENT NEWSLETTER - APRIL 2025

CHEMISTRY AND FERMENTATION SCIENCES NEWSLETTER

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WELCOME!

BY EDITORS-IN-CHIEF
ANGELA RUSSO & DAMIEN BAYNARD

Welcome to the April 2025 edition of the Periodic Times! This newsletter is created by chemistry and fermentation science students, for chemistry and fermentation students. In this edition, we focus on job and internship opportunities, along with valuable insights from our Professional Development Center here at App State. You'll find tips on resume building, creating portfolios, preparing for interviews, and navigating the job search process effectively.

As we begin to step into the next phase of our professional careers, it becomes crucial to lean on the support of mentors, career development services, and peers. While this time can bring high stress for many, remember that you write your own story, and everything will fall into place as it's meant to. We have also included exciting updates on students and faculty research projects, as well as a short interview with one of our esteemed Alumni.

We hope this edition provides valuable guidance as you take your next steps toward a successful career. Stay connected, keep learning, and continue to support one another. Best of luck in all your future endeavors!

JOBS & INTERNSHIPS

Experience Can Lead You to Your Future

BY CORINN HARRINGTON & SARA JEDRA

Are you looking for internships or job opportunities after graduation?

Programs like the **NSF Research Experiences for Undergraduates (REU)** are actively seeking undergraduate students to join their research labs. These opportunities are available locally and internationally, allowing you to expand your knowledge and gain valuable experience.

NSF Undergraduates Funding

If you are interested in working within the **Chemistry and Fermentation Science Department** at App State, more information on available positions can be found on the department's website linked below. For students at other institutions, we encourage you to explore similar opportunities by checking your university's chemistry or science department website for research positions, internships, and job listings.

Department Website

For those looking to enter the **industry workforce**, there are numerous platforms to explore job opportunities in various chemistry-related fields such as the ACS Job Board, Handshake, and ZipRecruiter:

American Chemical Society Job Board
ACS Chemistry Jobs

Handshake
Handshake

ZipRecruiter
ZipRecruiter

JOBS & INTERNSHIPS

Experience Can Lead You to Your Future

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Specific Internship Opportunities in North Carolina

North Carolina State Crime Laboratory (NCSCL) Internship Program

- **Overview:** The NCSCL offers internships in various forensic disciplines, including Toxicology, Drug Chemistry, Trace Evidence, Forensic Biology, Latent Evidence, Firearms, Digital Evidence, and Evidence Control. Internships are available at all lab locations: Raleigh, Triad Regional, and Western Regional.
- **Eligibility:**
  - Applicants must be at least rising juniors or graduates of a four-year degree program.
  - Majors should be in natural sciences (e.g., chemistry, biology, forensic science) or computer-related fields.
  - Candidates must successfully pass a background check.
- **Application Deadlines:**
  - Fall Internships: **May 1**

NCDOJ

- **Note: For the most current application deadlines and details, visit the program websites directly.**

Research Experiences for Undergraduates (REU) Programs in North Carolina

Computational Statistics REU at UNC Greensboro

- **Dates:** May 26 – July 31, 2025
- **Application Review:** Started February 1 (10 slots still available at time of writing)
- **Overview:** A 10-week program engaging students in complex data analysis using statistical and machine learning tools. Participants receive a stipend and contribute to various research projects.

Mathematics & Statistics Department

Integrated Computational and Experimental (ICE) REU at NC State University

- **Program Dates:** May 19 – July 25, 2025
- **Application Deadline:** February 15 (Applications still considered if slots are not full)
- **Overview:** A 10-week program designed for rising sophomore and junior students from undergraduate institutions. Research combines experimental techniques and computational methods within NC State's Department of Chemistry.

PROFESSIONAL DEVELOPMENT CORNER

BY NICK POLHAMUS

As chemistry students, the technical skills you're developing are the foundation of your future career. Whether you're seeking an internship, job, or preparing for graduate school, it is essential to be proactive in shaping your professional profile. Please be sure to check out page 11 for helpful links to The Career Development Center and the Appalachian State DCFS website.

Career and Development Center

The Career Development Center at App State is a valuable resource for students. One of the most useful services they offer is personalized resume reviews, which can help strengthen your resume and make it stand out to employers. Mock interviews are also available, providing an opportunity to practice for real-world interviews and receive feedback. They also organize networking events for students which offer a chance to connect with potential employers and learn more about various career opportunities. Check with your school if they have a similar department. **(careercenter@appstate.edu, 828-262-2180)**

Professional Portfolio

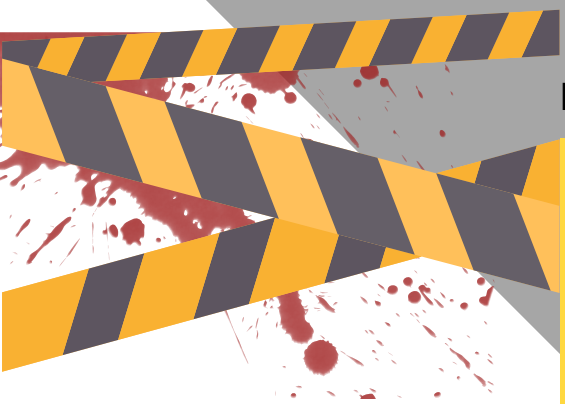
Build a professional portfolio. A portfolio allows you to demonstrate not only your academic work, but also your hands-on experience and technical abilities. By gathering relevant academic work, such as lab reports, research papers, and projects, you can highlight your skills in writing scientific literature. If you've completed internships or gained relevant hands-on experience, summarize these in your portfolio while focusing on the skills and knowledge you gained. It's also a great idea to create an online portfolio through platforms like LinkedIn or a personal website. This will allow you to update your portfolio regularly with new experiences, certifications, or capabilities as you continue to grow. Having a well-organized and up-to-date portfolio can make a significant difference in standing out to future employers.

Interviews

Your first face-to-face interview is an important opportunity to make a lasting impression. To succeed, preparation is key. Start by researching the company thoroughly—understand their values, goals, and recent projects so you can tailor your responses to align with their values. Be ready to answer common questions like “Tell me about yourself” or “Why do you want to work here?” and practice articulating your strengths and experiences clearly. In a face-to-face interview, your body language is just as important as your answers. Maintain eye contact, offer a firm handshake, and sit up straight to convey confidence and professionalism. Listening attentively is crucial—make sure you understand the questions fully before responding, and don’t be afraid to take a moment to collect your thoughts if needed.

CLUB NEWS

BY KAITLYN KOZICKI



FORENSIC SCIENCE CLUB

Explore hands-on learning and expert testimony of forensic science! The Forensic Science Club is devoted to educating the Appalachian State student body about the wonders of forensic science! Speakers from institutions such as the SBI, Watauga County Sheriff's Office, and Appalachian State Instructors come to express their passion for forensics and answer any questions! The FSC holds events such as Cold Case Game Night, guest speakers, and a real bomb squad demo offered in the Spring! Meetings are Wednesdays at 6-7pm. All majors are welcomed!

Contact: asu.forensicscienceclub@gmail.com

THE APPALACHIAN CHEMICAL SOCIETY

Are you looking to get some behind-the-scenes, hands-on chemistry experience? Come join the App State Chemistry Club! The Chemistry Club strives to provide a better understanding of science while also having fun. While academics are a first priority, the social aspects come in close second. Large public demonstrations, guest speakers, and game nights are the Chemistry Club's specialty. Additionally, you can get your hands on some cool chemistry themed merchandise such as hoodies, keychains, and fun stickers! Meetings are held twice a month on Tuesdays at 5:30 pm in Garwood Hall 112. For more information on joining the club, contact Seleen at alhoranis@appstate.edu. All majors are welcome!

STUDENT NEWS

BY LETICIA VALENZUELA

I had the privilege of speaking with two students that have the same major and concentration, yet have two very different paths that will be depicted by their statements.

Eric Corley

Year: Senior
Major & Concentration: Chemistry, Certified
Research mentor: Dr. Babyak

What is your research?

"My research is on the analysis of pesticides, herbicides, and their metabolites commonly found in Christmas Tree farming. Gas chromatography tandem mass spectrometry (GC-MS/MS) is used to analyze these molecules for its low detection limits by using multiple reaction monitoring (MRM)."

What are your plans for the future?

"I am going to West Virginia University to pursue a Ph. D in Analytical Chemistry starting in Fall 2025."

Any advice for new chemistry majors?

"Talk to your professors and get to know them! Go to their office hours, they are all very nice people, and you can learn a lot from them and make connections that you could use later in your career."

STUDENT NEWS

BY LETICIA VALENZUELA

Angela Russo

Year: Junior
Major & Concentration: Chemistry, Certified
Research mentor: Dr. Shaw

What is your research?

"While the SRG has a range of research efforts, my research focuses on the topic of cosmeceuticals. I am currently working on a project to enhance the anti-aging and brightening effects of skin serums. Vitamin C and peptides are the most commonly used components in a topical serum that increase the rate of collagen production. Collagen is the most abundant protein found in the human body, and from an aesthetic standpoint, it is responsible for the elasticity and strength of our skin. As we mature, the ability for our skin to produce collagen begins to diminish. As a result, our skin may lose its luminance and fine lines begin to appear. Additionally, discoloration of the skin may occur that can look like dark spots or patches. Those who have scarring from acne or surgical procedures may also experience discoloration. To combat these phenomena, a skin serum containing vitamin C and peptides can be very effective. However, the efficacy of these compounds is easily compromised. Vitamin C, for example, is easily oxidized in an aqueous environment. So when we apply it to our face, it does not stay on our skin for enough time to carry out its full potential. A study showed that by bonding these two components together, it will create a more stable and effective molecule that can deliver enhanced therapeutic effects to the skin.With the help of Dr. Shaw, I aim to resolve this issue by conjugating vitamin C and peptides in solution. We hope to help those who are interested in these types of treatments so that they can look and feel their best."

Any advice for new chemistry majors?

"When thinking about what college path I wanted to pursue, chemistry was the furthest thing from my mind. Taking my first ever chemistry class as a college student was a huge change of pace, and it took me a couple of semesters to "crack the code" of how to succeed. I found that the most useful tools in completing my classes successfully were effective comprehension and repetition. I'm sure these are things you all have heard before, but I can confidently say that they are responsible for my success in this field of study. Look at your material at least once a day. Explain it to yourself in concepts that relate to you or make sense to you. Teaching to a friend (real or imaginary) can really help you identify the concepts that you are understanding as well as things you can improve on. Be confident in yourself and the abilities of your mind. Once you figure out the way that you learn most effectively, you will find that you can do things you never thought you could. This isn't easy work, but nothing is impossible. Make sure to utilize any and every resource you are given. We live in an age where we can access just about any information at our fingertips, so learn what is most useful to you. Good Luck!"

FACULTY SPOTLIGHT

BY TANISHKA DASS

Dr. Michael Reddish

Associate Professor and Research Mentor

Hello Dear Readers,
My name is Tanishka Dass, and I am a Biochemistry major. I began conducting chemistry research in Dr. Reddish's lab during my sophomore year. Over time, I've made many friends in the lab, and Dr. Reddish has become a valuable mentor in my life. I interviewed him to learn from his experiences working with students and to gain insight into the scientific journal publishing process.

Q: Can you tell me about yourself, your academic journey, and what got you started in chemistry?

A: My name is Micheal Reddish, I am a Chemistry professor and primarily teach Biochemistry. I went into college thinking that I wanted to be a biology or chemistry major. Specifically, I had an interest in the deeper mechanics of athletic performance being an athlete in high school. That changed into wanting to work in public health and understanding various systematic changes. Through doing research about specific public health schools and programs related to medicine, I realized that I had an interest in basic science. I decided, which is typical of many people in Chemistry, to pursue a PhD especially since I had the credentials to do so.

Q: Can you provide an overview of your current research and what problem or question you are trying to address?

A: In our lab we are interested in a family of enzymes called the cytochrome P450 enzymes. These enzymes interact with native compounds in our bodies, like vitamins and steroids, while also aiding in metabolism of nonnative compounds like pharmaceuticals. Due to their varied critical roles in our bodies, they are often used as targets for clinical treatments. We are currently focused on human cytochrome P450 27A1 because there is a belief that this enzyme's response can treat certain breast cancers. The goal of our lab is not to design drugs, but to understand how these enzymes work in all aspects.

Q: You have been awarded the largest NIH grant in App State's history. How has this changed your approach towards the research you do? Does having this kind of a grant adds pressure towards your research and lab?

A: The NIH grant provides additional support which enables our lab to expand in terms of the number of students that can train in the lab and the thoroughness of their experience. Student training now includes access to more equipment and the ability to creatively explore their research projects in a more stable manner. With this sort of support the lab and myself have a responsibility to be stewards to provide good research opportunities for the University community. This is why we started our lab and are very happy for the opportunity to continue.

FACULTY SPOTLIGHT

BY TANISHKA DASS

Dr. Michael Reddish

Associate Professor and Research Mentor

Q: You have been published in the Journal of Biological Chemistry and the Archives of Biochemistry and Biophysics. How would you say this has impacted your career as a chemist?

A: Publication of work is an important aspect of science and some individuals suggest that if it is not published then it doesn't count. We are very happy to see that our work is valued in the eyes of others in the scientific community. These publications have led to many incredible opportunities at conferences where we have conversations about how to keep the science we are doing moving forward. The process of publication varies for each manuscript, with some getting accepted with minimal edits and others needing more support. It is important to uphold these editorial and scientific standards and there is value in the entire peer review process. It was a very long process and I prefer to present at conferences rather than publishing.

Q: How important do you think student research is for anyone in Chemistry? And what do you think the best way to approach a professor about joining a research lab is?

A: Research gives you an important opportunity to strengthen your laboratory and theoretical skills. It allows you to find the value for all of the material that we are asking you to learn in courses. Most importantly it allows you to figure out if bench work/research is something you want to be part of your career moving forward. To approach a professor, first read their research descriptions online and find which ones interest you. Then email the research faculty and figure out availability or if you have a chance to work with them more. Reach out to more than one professor to learn more about them and the lab. It is important to know both the science and lab culture before joining.

Q: Do you have any advice for students that are graduating whether that be related to graduate school or just about life in general?

A: Find what grounds you. It is easy to be passionate about science, especially in graduate school where you are surrounded by other individuals that share the same interests. But sometimes science is trying and difficult, it is in moments like these where you need to be able to go back to what grounds you. Whether that be family, friends, or hobbies make sure you have something to always fall back on.

DEAR LABBY

Are you in need of advice or an answer to your chemistry questions? Dear Labby provides a space for you to anonymously ask whatever you may need, and allows current students to answer to the best of their ability! **https://docs.google.com/forms/d/e/1FAIpQLSfa526nmn6y8EQe7I6cSPl_fe9_QY7LVefWs7EPiUWXkoWWDA/viewform**

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ALUMNI SPOTLIGHT

BY JOSIAH YORK

ALLISON KEYS

Graduation Year: 2023
Degree: BS in Chemistry with a concentration in environmental.

Allison Keys is a graduate student at Virginia Tech working toward her PhD. Recently she passed her preliminary exams and is working towards her orals at this time. She is thriving in graduate school, and has agreed that the education she received at App State made sure that she had what it takes.

Q: What was the application process like for grad school?

A: My application process started all the way back at the beginning of summer before my senior year. I started trying to figure out what I wanted to do and looking at universities that fit those requirements. Throughout the summer I narrowed that list down until I was sure I knew where to apply. Then I wrote my applications, which were different for different schools, typically you need an essay and your transcripts. I was accepted to VT and once I went to their recruitment weekend, I just loved it there (just like I had when I visited App). I accepted their offer and the rest was history!"

Q: What skills/knowledge transferred the most from undergrad to life in grad school?

A: "For knowledge I will say that App State prepared me very well for the grad classes here at Tech. Even though I was taking graduate level courses I was able to keep up and I think that is due in large part to the professors at App. The skills I think are a bit different, no matter what lab you join (if you go to grad school), there will be a bit of a learning period as you readjust to something different from what you're used to. And of course, the basics stuck with me (how to read a grad cylinder, acid into water not the other way around, etc.) but most important are those soft skills. How do you use logic towards a solution, are you willing to ask lab mates for help, can you be in charge of your own work. I think those skills that I learned as I gained seniority at App have helped me in my grad school life."

Job & Internship Search

BY ERIC CORLEY

Are you starting to look for a job or internship? There are many resources at Appalachian State University to help you during this process such as the career development center. Various personality tests are provided that can help you identify what type of jobs would best fit for you. Trained professionals at the center can help you prepare for applying for jobs, such as resume building and mock interviews.

You can start your journey here:
https://careers.appstate.edu/

The department of chemistry and fermentation science website also has resources to look for careers. On the DCFS website, you can find student job openings in the department and professional job boards that are jobs related to chemistry.

DCFS Website

Are you currently open to work? In addition to the resources provided at Appalachian State, there are some online job platforms where you can find jobs and make connections. Handshake is the online career services application utilized by Appalachian State. It allows students and alumni easy access to job and internship openings, career fairs, and career center services. Another job engine you could use is LinkedIn. This job engine provides a vast network of resources and jobs in many fields. You can tailor your searches to what you are interested in and get notified about openings and events!