

THE PERIODIC TIMES

STUDENT NEWSLETTER - MARCH 2025



CHEMISTRY AND
FERMENTATION SCIENCES
NEWSLETTER

TABLE OF CONTENTS

Jobs and Internship
Announcements - P. 2

Professional Development
Corner - P. 3

Club News - P. 4

Student News - P. 5

Faculty Spotlights,
contributors, and Dear
Lobby - P. 6-8

Alumni Spotlight - P. 9

Research Opportunities for
Undergraduates - P. 10

The Fun Stuff - P. 11-12

WELCOME!

BY EDITORS-IN-CHIEF
SELEEN AL HORANI & REGAN SNYDER

Welcome to the March 2025 Newsletter edition of The Periodic Times! Our student newsletter will supply you with the most recent information about the Department of Chemistry & Fermentation Sciences, as well as what you need to know to elevate your academic journey and excel post-graduation! In this edition, we kick start the semester strong by providing information about job and internship opportunities, student news by LEAD tutors, and REU opportunities for the summer of 2025. You might ask, "What is an REU?" Luckily, this topic has its very own page in this edition, so go check it out! You can also find information about the professional development center and the resources they provide for job interviews, writing a resume/cover letter, or to talk about graduate school. If you have extra free time, check out our club news and learn about the fermentation and chemistry clubs. Have a favorite faculty member? Well, they are probably hiding under the faculty news waiting for you to read about them! To end off with a bang, check out our alumni spotlight to hear from a past student who has also been in your shoes. Thank you for picking up our March 2025 edition of The Periodic Times!

JOBS & INTERNSHIPS

BY ELI HERNANDEZ

Are you interested in being employed?

If you are, you must be looking to gain practical experience, develop skills, and build a professional network that will further your career. Consider doing an internship!

Below are QR codes that will help you find opportunities for internships, career advice, and networking opportunities.



PROFESSIONAL DEVELOPMENT CORNER

BY JUDSON BUSCH AND RAEALYN DOBYNE

Graduation and summer break brings many internship, job, and school opportunities. Your application is the first step to making sure you stand out to employers and other professionals. Make sure you know the difference between these important application materials!

Resumes

A resume is a one-page PDF that summarizes why you are a compatible candidate, avoiding first-person pronouns. A chemistry resume should address education, including the institution, honors, and degree immediately following your name and contact information. Research experience, skills, professional involvement and leadership experience subsections should be included. The more relevant an experience or a skill is to a position, the more bullet points or emphasis it should have.

Cover Letters

A cover letter is a pitch to an employer why you would be a good fit for a specific position. They are formal and concise: an opportunity for you to summarize your professional achievements and skills. They are also tailored to a specific job opening, meaning your message should be biased to the position or employer.

Curriculum Vitae (CV)

A CV is used for academic pursuits like graduate school, grants, and fellowship applications. A CV is used as an opportunity to show employers or faculty a complete list of your academically relevant experiences including an introduction, education, research experience, presentations, publications, awards, and professional memberships (including dates).

Personal Statements

A personal statement is typically a character limited opportunity for a candidate to discuss their personal experiences, values, and ambitions. These are most often used for graduate school or medical school applications. This is an opportunity to express your overall narrative, providing a sense of your character and aspirations.

To explore their website, or make an appointment, use the following link!

<https://careers.appstate.edu/>



CLUB NEWS

FERMENTATION SCIENCES CLUB

BY ASHLEY CLODFELTER

Contact: asufermentationclub@gmail.com

Interested in Fermentation? Attend one of the weekly Fermentation Sciences Club meetings held every Thursday at 5 pm in the Fermentation Lab! Located in Mountain Laurel Hall, the Fermentation Lab is a place that beginners to near-experts gain valuable experience by learning the methods utilized in making our favorite fermented foods and beverages. Workshops are also offered throughout the semester that allow participants to engage in hands-on fermentation activities such as making hard-cider, sauerkraut, kimchi, and more!



THE APPALACHIAN CHEMICAL SOCIETY

BY SELEEN AL HORANI

Want to experience fun and explosive (yet laidback) chemistry beyond the lecture and lab? If yes, then the Appalachian Chemical Society (ACS) is the right place for you! The chem club held its first activity on Feb. 18th in the Makerspace at Belk Library, where members designed their own keychains on Adobe Express and used the Glowforge Laser Printer to cut and carve their designs onto wood and acrylic. Upcoming fun activities include but are not limited to soap-making and Professor Jeopardy! Additionally, ACS is now taking pre-orders for cool club merchandise. Meetings this semester are held on Tuesdays at 5:30 PM, twice a month. If you're curious about ACS, feel free to reach out to its President Seleen Al Horani at alhoranis@appstate.edu.



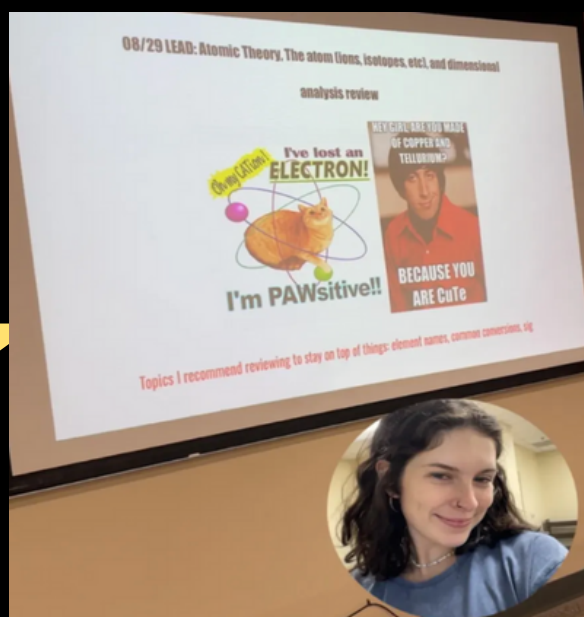
LINK TO PRE-ORDER FORM



MEET THE SI LEADERS!

Gretchen (she/her)

Gretchen is a senior criminal justice major with minors in psychology and chemistry. In addition to being a tutor, she is also part of the chemistry and forensic science clubs. She started working at the Student Learning Center because she had a really good tutor for CHE 1101 and thought it would be nice to help other people in the same way. Her favorite part of the job is getting to connect with other students and tutors as well as seeing a lot of growth in students throughout the semester. The most challenging part of the job is balancing it with all her other obligations. Her best pieces of advice to a struggling chemistry student (besides coming to LEAD, of course) are to read the textbook and attend office hours. Most, if not all professors are truly kind and will take the time to help you if you go to office hours or email them to show that you care about the class and want to improve.



Ella (she/her)

Ella is a sophomore majoring in chemistry (certified concentration) and physics (applied concentration). In addition to tutoring, she is also the VP of programming for Future Business Leaders of America and part of the Honors College. She started working at the Student Learning Center because she wanted to bridge the gap of understanding between students and faculty, and help others feel less dread about and more fun in their chemistry and physics classes. Her favorite part of the job is when she sees a student have a "lightbulb" moment: when they are able to truly understand and apply the material beyond completing a worksheet. The most challenging part of the job for her is admitting when she is wrong. While she is pretty good at these subjects, she is also a student who is still learning, and the most important part is admitting to your mistakes so you can improve. Her best piece of advice to a struggling chemistry student is to not be afraid of asking more questions! It's better to take the time to clarify a concept now than to skip it and feel even more lost later. Chances are, someone else in the class is also confused!



Dr. Nicholas Shaw

Associate Professor and
Research Mentor



FACULTY SPOTLIGHTS

BY MICHAEL LOWE AND
ASHLEY CLODFELTER

Q: Publishing with a professor is a common goal for chemistry students. What are some ways students can increase their impact on their research group?

A: Publishing is certainly one possible way that most academic faculty gauge the progress of research, but it's not the only way. For us in our research group, because we have a patent and we're spinning our research out into the private sector, we're not willing to share the secret sauce at all with anybody doing a paper. The minute I write a paper, anybody, anywhere, could start to do what we do, so there's a lot of different metrics by which you can evaluate research success. When you look at what a student could potentially do to advance your research for a startup or advance research for publication, I'm looking for students that are intellectually curious, and not dissuaded by failure. If you possess those two qualities, you're likely going to be a massive success as a scientist in any faculty member's research group. To get to a publishing point, or get to a point when I'm looking at investors and asking them for money, you have to push hard and the science is not forgiving. It takes a lot of time, and a willingness to fail and continue to push.

Q: Pursuing a science major as an undergraduate can be daunting, especially when introduced to advanced lectures and lab materials. How can students prevent being overwhelmed while still progressing?

A: First and foremost, when you think about pursuing a stem degree, there are so many things that you need to have up in the air in order to understand and command the discipline. My advice to anybody, is to not become overwhelmed by what you don't know. I know very little about biochemistry, inorganic, physical chemistry, and environmental chemistry. I know a little bit of analytical, and a smidge of organic. I'm okay with that as a scientist, and I understand if you take general chemistry, you start to learn about kinetics, but you are not going to see it again until applied biochemistry. Develop a mastery mentality, then you'll be able to slowly pick up the pieces as you see them over and over and over again. You are going to continue to learn. It takes two or three times to see this stuff to fully get it all the way absorbed for many people, don't forget that. I was a C+ student in undergrad, and it took me so long to finally get my PhD. It was too obtuse for me until I finally saw it for the fourth time.

Q: What was the last research paper or journal article that you published?

A: The last thing that I published would be our patent on our research, how to use nano reactors, in organic synthesis. My last bona fide publication would be our publication in the journal of chemical education when we talked about storyboarding experiments as a way to plan scientific experiments.

Q: What type of chemistry do you teach and why do you teach it?

A: I teach organic chemistry and I teach it because I really like working with sophomore level students in college. It's a transformative time. The students I have most are sophomores that have just survived general chemistry, and I'm throwing a topic at them that they'd likely have not seen or heard anything about. If they work in the class and they put in time, the transformation of a student starting in my organic chemistry I class to what they become at the end of organic chemistry II is a really cool transformation to make with students.

Q: When you're not doing chemistry, what do you make time for?

A: My family, I have two kids, Parker and Grayson. Parker's 10, and Grayson is four. She's a hot mess. Outside of doing that, I really enjoy cycling. I try to get about 3,000 miles each season. I really like to go stupid fast on the road bike down the mountains, totally unsafe. I've ridden up and down almost every ascent and descent around here and my top speed around Boone, I hit it last season, was 54.6 miles an hour. It was awesome.

Dr. Jefferson Bates

Associate Professor and
Research Mentor



FACULTY SPOTLIGHTS

BY MICHAEL LOWE AND
ASHLEY CLODFELTER

Q: What are some tips or tricks that you have to prevent students from being overwhelmed while still progressing in their studies and their research?

A: For me, I think the strategy is trying to break down complicated problems, tasks or instruments into simpler building blocks, which you can combine together, and so I think a lot of the problem solving that we learn about in college is actually how to take a problem that seems unapproachable, and to try to find ways to break it into smaller problems that are approachable. Once you've tackled the smaller problems, then you can fit those solutions together to tackle the bigger problem. In general, having this idea about breaking a problem into a series of steps, or a series of easier subproblems, or even working with instruments in this way, like learning incrementally how to use the instrument. I think that's the best way to go. Compartmentalizing a problem, working on it little by little, that way it will help you.

Q: What are some ways that students can increase their impact on their research, or on a research group?

A: Reading is actually a key skill here and taking initiative to try to push ahead when there are questions of what to be done. The reading is because you'll often be asked to do something you might not know about, so you want to read about how other people have done it, or how to do it. And then being able to decide on a path once you have many options. That's what I mean by taking the initiative, but in research I often think that's an important skill if you're faced with many options and you have to make the uncomfortable choice of which way to go. The sooner you can get more comfortable with making uncharted decisions, the better. I think that's a good way to go.

Q: What are some life or career skills that have helped you, that are not related to chemistry, get where you are today?

A: Writing, reading, and graphic design. Often it's funny that in science, we try to perform experiments and gather data, and then we have to communicate that information and that requires either a presentation or a written paper. And so actually getting comfortable with writing complex sentences, talking about science, using scientific language in a technically correct way. Those are skills that many undergraduates have challenges doing at the beginning, but the more you practice, the better it becomes. So for me, I think that the writing and reading are crucial, just because we have to take those skills and bring them into science. Graphic design is also related because we need to make figures and posters. We have to communicate our science in an effective way and 99% of the time, a table of data is less informative than a figure. Learning how to transform data from numerics into a visual representation, that's another key skill. Graphic design, how to balance your images and colors, and ways to make things visually appealing. Those are skills that you also pick up as you go along.

Q: What was the last research paper, or journal article that you published?

A: The last paper that I published was a collaborative effort. I worked with a student who now works at the FBI, and then my fellow faculty member at Furman University, Dr. Gary Guillet. We published a paper in inorganic chemistry about a tri-iron complex where we used computational chemistry to investigate the metal-metal bonding and help explain the experimental results that were obtained a few years before.

Q: Are you currently conducting research, and if yes about what?

A: Yes, I am currently conducting research. My research group looks at the intersection of computational and inorganic chemistry, and utilizes spectroscopy. We use computational methods, such as density functional theory (DFT) in order to model the properties of molecules on a computer and then we're able to compare those results to the experimental values in order to present a more complete picture of the chemistry that's happening.

Dr. Nancy Asen

Assistant Professor



FACULTY SPOTLIGHTS

BY MICHAEL LOWE AND
ASHLEY CLODFELTER

Q: Publishing with a professor is a common goal for chemistry students. What are some ways students can increase their impact on their research group?

A: There is a minimum requirement to be a part of a team, and that depends on the professor. So whatever criteria that professor has, whenever you find yourself in a team, the first thing should be self motivation because that is what people need. Research is demanding, with time and money.

Q: Would you say that your goal is to not hold their hand the whole time?

A: You have to be active, you need to be ready to go the extra mile because there is a lot that goes on behind the scenes in research, like studying to get more answers to particular things. And while we are doing that, we're discovering more things. You should be able to study that area of research. That is how innovations begin to come up and they should be able to ask questions. You need enough knowledge, to know what you don't know.

Q: Pursuing a science major as an undergraduate student can be daunting, especially when introduced to advanced lectures and labs. How can students prevent being overwhelmed while still progressing in their studies?

A: I go back to where I started from self motivation. You should have the capacity to do more. It's not everyone that is able to do so many things at the same time, so if you know something you want to do, you should be ready and make room for extra because you are going to be doing more. It's like having an extra job. Apart from your normal schedule, you're going to classes, you have homework and labs and all that. For some labs, you need up to 10 hours in a week to do that, so you need to have extra capacity to do that. You should be able to manage your time well and you're going to lose some things. Maybe you lose part of your social life, so you should be ready to do that.

Q: Would you agree that sacrifice is an important part of advancing your studies?

A: It's like an investment in your future. So when you see that way, if you don't invest, then whatever you become, is as a result of your investment from yesterday, from the past. So what if this is what is worth doing, you are investing for a future, so it's worth doing for you.

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/1FAIpQLSfa526nmn6y8EQe7I6cSPI fe9 QY7LVefWs7EPiUWXkoWWDA/viewform>

CONTRIBUTORS

Editors in Chief: Seleen Al Horani and Regan Snyder

Formatting Editor: Teddy Shepherd

Contributors: Ashley Clodfelter, Carter Hayes, Elijah Hernandez, Finn O'Hara, Michael Lowe, Parker Smith, Regan DoByne, Judson Busch, and Masa Al Horani

ALUMNI SPOTLIGHT

BY FINN O'HARA

MORGAN HERN (HE/HIM)

Graduation: Spring 2024

Degrees: BS in Chemistry, certified and biochemistry concentrations



Q1: What are you currently doing?

"I am a PhD student at Rochester University studying inorganic chemistry. I do research for Brandon Barnett working on synthesizing transition metal complexes relevant for oxidation catalysis and C-H activation."

Q2: What was the application process like for grad school?

"The first step was to find schools I was interested in. I looked at factors like professors I would want to work for, the requirements to graduate the program, the resources the school has access to, the size of the school, and location. Then, I chose my favorites and made my application. I had to compile my transcript, 3 letters of recommendation, and 1 or 2 essays depending on the specific school's requirements. The schools I decided to tour were the ones I was most excited about the research. The most important part of touring schools is to understand how the professor mentors students, what the daily life of a student is like, and what the department culture is like. I had the opportunity to answer these questions by directly asking my prospective professors and current graduate students. I chose Rochester because they had a strong inorganic department, the instrumentation that I wanted to learn, multiple professors I wanted to work for, and friendly students who were happy with their work. Rochester was the only university where I left the visitation with more professors that I would be happy working for than I went in."

Q3: How would you describe your schedule?

"As a first year student, my week is busy with classes, my teaching assignment, and learning the techniques necessary for the research group I joined. Most of the graduate courses I take are half semester courses, and I take 4 per semester. I am a TA for 2 sessions of organic lab per week and grade their assignments. When I can, I work on a project with a fifth year graduate student to learn the synthetic and characterization techniques that we use to do our research. I would estimate that this is 50-60 hours a week. Despite this heavy load, I make time to have fun. It's common that I make plans with classmates or sometimes my research lab will do social activities together."

Q4: What skills/knowledge transferred the most from undergrad for your concentration?

"As an inorganic student, unfortunately my biochemistry concentration had little application to what I do now. My research experience developed my critical thinking and problem solving skills that I use every day in the lab. The graduate courses pick up right after the undergraduate courses, so I have used knowledge from classes such as inorganic, physical chemistry I and II, quantitative analysis, and organic."

Research Experiences for Undergraduates



BY MASA AL HORANI AND PARKER SMITH

This QR code will take you to all of the NSF funded REUs and provide you with the websites and contact information for each opportunity!



Are you looking for a productive way to significantly boost your applications for graduate schools? REUs or Research Opportunities for Undergraduates are paid summer research opportunities funded by the National Science Foundation (NSF) for students to gain valuable research experience in scientific and engineering fields. Many universities, organizations and institutes nationwide (and some abroad!) offer these 8-10 week immersive research experiences, where a stipend with an average of \$700 per week for food and housing are provided. REU participants learn how to conduct scientific research in their areas of interest. The criteria for each REU program vary so as you explore, keep in mind that some programs offer entry-level positions while others are seeking students with more experience. Eligible applicants must be rising sophomores, juniors, or seniors and must not be expected to graduate before the beginning of the program. The application window is typically between January and March, with most programs having their deadline in February, but pay attention to the individual program deadlines, which vary widely, and mark your calendar to stay on track. Participating in an REU program will introduce you to new areas of cutting-edge research that could help you narrow down your research interests and will certainly make you a stronger graduate school applicant. REUs are competitive and require a strong application consisting of up to 2 essays, a resume and a letter of interest, and up to 3 letters of recommendation. As these programs draw many applicants, it is important to apply to many that interest you and stay positive! There are many resources to help you craft an excellent application, starting with your own professors!



U.S. National
Science
Foundation



Research Experiences
for Undergraduates
National Science Foundation

Search for REU opportunities at this link if the QR code does not work!

<https://www.nsf.gov/funding/initiatives/reu/search>

CHEMISTRY WORD SEARCH





Here is a word search that Seleen and Regan found! Have fun!

Name: _____

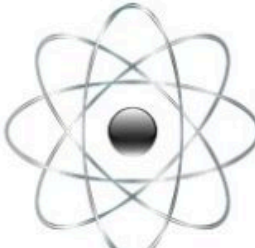
© Monsterwordsearch.com

Chemistry Word Search

Find the Words

- ATOM
- METAL
- BASE
- CATALYST
- POLYMERE
- IONIC
- MAGNETIC
- CRYSTAL
- EFFUSION
- NUCLEON
- CHEMICAL
- COMPOUND
- TEMPERATURE
- BEAKER
- BOND



P	M	Q	A	E	I	R	X	F	G	K	G	B	J	C	B	V
J	S	J	W	Y	Z	X	A	T	O	M	I	E	Y	O	C	D
W	D	F	M	G	O	H	U	F	P	E	Z	A	S	M	W	G
X	U	T	X	K	Y	I	K	C	Z	T	M	K	X	P	V	J
S	C	I	I	Z	Z	B	O	P	S	A	D	E	O	O	Z	V
P	A	D	G	M	D	N	B	S	B	L	O	R	N	U	N	B
F	T	Q	E	F	F	U	S	I	O	N	E	U	D	N	R	L
B	A	W	L	H	X	C	G	T	C	E	E	K	S	D	R	I
C	L	J	V	E	Y	L	C	D	E	B	N	M	Z	C	O	O
W	Y	T	M	L	X	E	T	V	B	A	S	E	L	E	W	N
G	S	X	U	M	F	O	M	F	B	P	I	Z	A	V	I	I
H	T	P	Z	B	O	N	D	C	Z	N	X	M	S	G	S	C
C	N	V	G	L	D	U	Z	X	W	X	R	D	E	R	Z	T
S	Z	J	R	D	N	J	A	M	O	R	M	J	S	Q	Y	Y
E	H	D	O	X	M	A	G	N	E	T	I	C	W	Q	U	K
U	G	E	M	H	M	L	M	V	V	Z	D	R	G	T	M	Z
L	X	M	P	Q	K	V	U	E	H	K	N	Y	D	Z	U	C
C	H	E	M	I	C	A	L	M	S	T	S	S	P	O	W	I
L	R	I	O	S	J	Z	G	Q	M	J	M	T	Y	H	O	I
E	Y	D	U	W	L	T	E	M	P	E	R	A	T	U	R	E
T	V	F	B	M	D	N	D	A	Z	P	W	L	N	U	J	O
J	T	I	P	O	L	Y	M	E	R	E	D	G	D	N	T	M

