DEPARTMENT of CHEMISTRY & GEOSCIENCES

VALDOSTA STATE UNIVERSITY

2025 Chemistry Newsletter

Welcome to the latest VSU Chemistry Newsletter! We have lots to share with you about the outstanding accomplishments of our students, faculty, and graduates. Thank you for reading.

In this issue:

From the Department Head's Desk

I hope you and your families are doing well. Each year, I look forward to sharing the successes and achievements of VSU Chemistry students and faculty in this newsletter. This issue is no different – you will learn about students achieving their academic goals, faculty receiving awards, and the department engaging with our community. There is another important bit of news to report.

Starting in July, Dr. Tolu Salami leads the department as Interim Department Head as I step aside to join the VSU Chemistry faculty. While I have thoroughly enjoyed my five years as Department Head, I am very much looking forward to restarting my research group and spending more time teaching. After all, it was the chance to work with students through teaching and research that led me to a career in higher education. I am excited to see the new ideas that Dr. Salami brings. His educational background in both inorganic chemistry and environmental science, his experience as a Professor within our department, and his numerous leadership roles within the College and University will serve him well. We are fortunate that he is willing to take on this responsibility.

Therefore, I'll let Dr. Salami have the last word on this page so that he can share his thoughts with you. As always, best wishes and Go Blazers!

Kurt Winkelmann, Professor (and former Department Head)

Looking Ahead: Strengthening the Department of Chemistry and Geosciences

It is a privilege to begin my tenure as the Interim Department Head of Chemistry and Geosciences. I step into this role with the utmost respect for our department's history and with great excitement for the years ahead. I want to thank the outgoing department head, Dr. Winkelmann, for his leadership and for laying a strong foundation that we can continue to build upon.

As we look ahead to the evolving landscape of higher education, two priorities stand out: supporting student success through improved retention and enrollment strategies and reimagining our curriculum to reflect the needs of today's learners.

We are mindful of the recent decrease in enrollment and retention, a trend not limited to Valdosta State University, but one observed across the country, particularly at predominantly undergraduate, comprehensive universities. One of my top priorities will be to identify and remove any barriers affecting student success. This process will include analyzing and understanding the causes of low student recruitment, enrollment, and retention within the department.

We will also strengthen pathways into the Chemistry and Geosciences programs by creating innovative, interdisciplinary opportunities and by enhancing existing academic tracks. In addition, we will review and modernize our curriculum to ensure it is engaging, inclusive, and relevant to the aspirations and challenges of the next generation of learners.

I am committed to working in close partnership with our students, faculty, alumni, university leadership and the community to strengthen and grow our department. Together, we can build a department that not only upholds the highest standards of education, but also cultivates a strong sense of belonging, curiosity, and resilience.

I welcome your ideas, insights, and feedback as we embark on this new chapter. My door is always open.

Tolu Salami, Professor and Interim Head, Department of Chemistry and Geosciences

Recent Department News

Our Department had another great year! Here are some of our notable achievements.

Faculty earn awards for teaching, research and service! The College of Science and Mathematics honored our department's junior-most faculty, **Dr. Shipra Gupta**, with the first annual Excellence in Teaching Award. Dr. Gupta's long-term goal is to turn a difficult subject like Organic Chemistry into the most loved and appreciated subject. She makes progress towards this goal by caring about her students and by recognizing the difficulty that Organic Chemistry can pose. Dr. Gupta believes that students' academic success is the responsibility of both the professor and the student.

VSU President Richard A. Carvajal honored **Dr. A. Ligia Focsan** with the 2024 Presidential Excellence Award for Research. The Presidential Excellence Award for Research recognizes a faculty member with a strong record of creative scholarship.

Dr. Focsan's research focuses on carotenoid radicals. She has authored and co-authored 25 peer-reviewed publications, given 75 conference presentations, contributed a chapter to a carotenoid book, and written a book on research related to carotenoid radicals. She emphasizes that having a mentor is critical for the success of every researcher, and she enjoys serving as a research mentor for her students at VSU.

Dr. Linda de la Garza was awarded the 2024 Presidential Excellence Award for Service. The Presidential Excellence Award for Service recognizes a faculty member who has demonstrated a strong and consistent commitment to service at VSU and to the community.

Dr. de la Garza believes that in any leadership position, it is important that we leverage our strengths and that we focus on the areas we are passionate about. By doing so, we can find fulfillment in our contributions and feel that our time is well invested.

She also believes that it is important that faculty have support from their department to explore innovative ideas that can enhance our common efforts. "I am grateful for the encouragement and support that I receive at VSU."

Student Members of the ACS (SMACS) receive awards! The 2024-2025 SMACS leadership team received the Outstanding Chapter Award and Green Chemistry Award from the ACS.

Recent SMACS events include outreach activities at local K-12 schools, research presentations by faculty, presentations by alumni sharing their career stories, and a seminar by Michelle Flemming from Space Forge about careers in the private space flight industry (see next).

VSU Chemistry and SMACS host a seminar by Michelle Flemming, president of Space Forge. Space Forge works with SpaceX and NASA to manufacture materials and products for industries like electronics, pharma, and alloys in space using zero and microgravity production. Michelle Flemming has over 15+ years of experience working and researching with NASA, Johns Hopkins Applied Physics Lab, Mayo Clinic, and more. Michelle Flemming met with faculty and students to share her story and information about her company. We appreciate her visiting us and talking to our students about career opportunities in the space industry.

Airionna Fordham receives Outstanding Student Award from the Southwest Georgia Local Section of the ACS (SOWEGA). Airionna is a senior chemistry major. She received the award at a ceremony sponsored by Optima Chemical Company in Douglas, GA. Congratulations, Airionna!

Chemistry research students win top honors at the 2025 VSU Symposium of Undergraduate Research. Two students received 1st place presentation awards: **Alayna P. Henriquez** (Gupta research group, Optimization of Photodimerization Reaction of Thymine) and **Jordan E. Flemming** (Woldman research group, Novel Probe for Extracellular Measurement of Superoxide). Congratulations!

VSU honored Dr. Candicee Childs (2017, Chemistry) with the College of Science and Mathematics Distinguished Alumna of the Year award. Dr. Childs graduated Magna Cum Laude from VSU with a bachelor's degree in Chemistry and a minor in Spanish. Her academic studies continued at the Medical College of Georgia, where she earned her Doctor of Medicine degree in 2023. She is now a Physician in the Massachusetts General Hospital Psychiatry Residency Program, specializing in child and adolescent psychiatry. In addition, she is a public speaker, model, fitness enthusiast, and mentor.

From left: Pierre-Richard Cornely (Dean), Kurt Winkelmann, Candicee Childs, Linda de la Garza, Tolu Salami.

Meet an Outstanding Alum – Dr. Khaleh Thomas

Our Chemistry graduates always impress and inspire our students and faculty. This year, we highlight a dedicated high school Chemistry teacher, Dr. Khaleh Thomas.

Dr. Thomas teaches 10th grade Chemistry at San Francisco University High School. She earned her bachelor's degree in Chemistry with a concentration in Pre-Pharmacy (summa cum laude) from VSU in 2008.

While at VSU, she performed research with Drs. Manning and Gosnell, studying the medical applications of iron chelators. She was also a member of Dr. John Barbas's research group. "I don't remember the details of the Diels Alder reaction, but I remember being in the lab and learning how to identify the products of the reactions!"

Dr. Thomas was an outstanding student-athlete at VSU as well. She was a Gulf South Conference Top Ten honoree (based on athletic and academic achievement and extracurricular activities), a member of the 2007 ESPN the Magazine's Academic All-District First-Team, and co-recipient of the VSU Female Student-Athlete in 2007.

She went on to graduate school at the University of South Carolina - Columbia. In 2013, she received the prestigious UNCF-Merck Graduate Science Research Dissertation Fellowship. She graduated in 2015 with her Ph.D. in Biochemistry.

Her love of teaching was evident in graduate school, where she served as a teaching assistant for classes in both the College of Education and the Department of Chemistry and Biochemistry. She helped to develop and taught a continuing education course for middle and high school teachers. She received the department's award for Excellence in Teaching twice as a Chemistry lab teaching assistant.

As a teacher, she has taught on-level and several different advanced chemistry courses. In addition to sharing her expertise in chemistry, Dr. Thomas has developed a Forensic Science course. She contributes to middle school chemistry education through curriculum development and mentoring as an Instructional Coach with Breakthrough Summerbridge.

Dr. Thomas also continues her involvement in school sports. She has coached girls' flag football, volleyball, and basketball. She also developed and led a powerlifting PE course for girls.

Outside of school, Dr. Thomas has volunteered as a mentor for LGBTQQ+ youth at the Lyric Center.

Dr. Thomas says that the most enjoyable times at VSU were just hanging out with her classmates. “We were a small cohort of chem majors that spent a lot of time together.”

The usual academic challenges and successes have a way of bringing students together. “I remember the study sessions for Physical Chemistry with Dr. Manning, most of us not really knowing what was happening! I remember celebrating those who had successfully passed the PCAT and were heading to pharmacy school. Many of my classmates are pharmacists now!”

Dr. Thomas shares how her experience as a Chemistry student influenced her career decisions. “VSU is where I really fell in love with science and led me to my graduate research in biochemistry and now a career in the science classroom. I loved organic chemistry with Dr. Barbas! He made the subject engaging and I remember always enjoying his lessons. I decided to study biochemistry due to my enjoyment of both Biochemistry courses with Dr. Gosnell. She was so passionate about the subject and her work! Instrumental Analysis was one of my favorite courses! Computational Chemistry with Dr. Manning was also a lot of fun! I remember enjoying making the models on the computer.”

One of the main challenges facing Dr. Thomas at VSU was studying Chemistry while also being a student-athlete. Basketball was a commitment from August through May, with the season taking up the bulk of her time from mid-October to mid-March. Unlike her teammates, she was enrolled in 3- or 4-hour lab classes each week. She says that this required her to learn how to manage her time. While her teammates were asleep on the bus or relaxing during a road trip, she was up studying for classes so that she didn't fall behind.

“There were times where I had to quickly transition from class to a basketball commitment (practice, film, team meeting) or vice-versa with little down-time in between. It was a demanding routine that I learned to navigate, but it was definitely fatiguing at times. I was proud of myself for having a successful athletic career and still graduating in four years. It was a bumpy ride, but I made it!”

Dr. Thomas and her wife recently celebrated their ten-year wedding anniversary. They currently live in San Francisco. She continues her athletic journey through powerlifting and flag football.

Do you know of an outstanding VSU Chemistry alum that we could feature here?
Contact Dr. Kurt Winkelmann.

Student Award Winners

Join us in congratulating our 2024-2025 Chemistry Student Award winners. Chemistry faculty select each award recipient. It is always a difficult choice due to the strong competition. Scholarships are supported by generous donors. We also give awards for excellence in particular courses, overall academic performance, service to the community, and research.

The College of Science and Mathematics held its annual awards ceremony in April and broadcast on Facebook so that family and friends could participate.

We are grateful to Dr. M. Elizabeth Derrick, Julia Wisenbaker Sumerford, Martha F. Robertson, Optima Chemical of Douglas, Georgia, and all our VSU Chemistry donors for their generous financial support for our students.

Julia Wisenbaker Sumerford Scholarship **Allayna Henriquez and Sarah Rourke**

Given to outstanding Chemistry students biannually.

Dr. M. Elizabeth (Betty) Derrick Award **Allayna Henriquez** (pictured left)

Provides a scholarship to an outstanding female student majoring in Chemistry.

Martha F. Robertson Scholarship in Chemistry **Tara Brooks, Lily Burnham, Alexa Lopez, and Alisson Rivas**

Awarded to academically talented first-year students.

Southwest Georgia ACS Optima Chemical Award **Airionna Fordham** (pictured right)

Recognizes outstanding service to the Chemistry Department and SMACS.

Winners of this year's chemistry discipline awards demonstrate excellence in specific courses. The winners are:

Polymer Chemistry in Organic Chemistry Award	**Daniel Warren**
Undergraduate Award in Analytical Chemistry	**Joseph Markovcic**
Undergraduate Award in Inorganic Chemistry	**Jordan Flemming**
Undergraduate Award in Biochemistry	**Kiersten Ley**
Undergraduate Award in Physical Chemistry	**Jordan Flemming**

Chemistry faculty recognize many aspects of student excellence, including research, service to the Department, and overall academic performance. Winners of this year's awards are:

American Institute of Chemists Award — **Carlton Francis** (pictured left)

Awarded to a student showing exceptional promise as a chemist.

Outstanding Chemistry Senior Award — **Kari Icard** (pictured right)

Given to a senior demonstrating overall excellent academic performance.

Outstanding Freshman Chemistry Award — **Cameron Newsome**

Given for achievement in first-year Chemistry courses.

Chemistry Undergraduate Research Award — **Airionna Fordham** and **Jordan Flemming**

Awarded to a student showing superior skill as a chemical researcher.

We asked awardees to tell us their career plans, favorite Chemistry class, and their extracurricular activities. Here are their responses.

Tara Brooks's favorite professor is Dr. Tom Manning. She plans to become a pharmacist.

Lily Burnham's favorite professor is Dr. Donna Gosnell. She plans to work as a forensic scientist.

Jordan Flemming's favorite professor is Dr. Tolu Salami. She currently works at CJB and will apply to grad schools this fall.

Airionna Fordham says that all the Chemistry professors have helped her. She wants to study the chemistry of poisons and venom.

Carlton Francis's favorite professor is Dr. Donna Gosnell. He plans to go to graduate school to study forensics.

Allayna Henriquez's favorite professor is Dr. Shipra Gupta. She plans to work in the chemical industry.

Karli Icard's favorite professors are Dr. Donna Gosnell and Tom Manning. She plans to attend medical school.

Kiersten Ley's favorite professor is Dr. Shipra Gupta. She plans to attend medical school at Mercer University this fall.

Alexa Lopez's favorite professor was Dr. Donna Gosnell. She plans to attend pharmacy school and become a hospital pharmacist.

Joseph Markovcic's favorite professor is Dr. Linda de la Garza. He plans to work in the chemical industry.

Cameron Newsome's favorite professor is Dr. Shipra Gupta. He plans to attend medical school.

Sarah Rourke's favorite professor is Dr. Linda de la Garza. She will go to graduate school to study semiconductors and renewable energy.

Daniel Warren's favorite professor is Dr. Gopee Sreenilayam. He is attending pharmacy school at UGA this fall.

Congratulations to all our student awardees!

Chemistry Faculty Spotlight: Dr. Kurt Winkelmann

Every spring, I ask one of our Chemistry faculty to tell you about their research. This year, it's my turn!

One of the most difficult aspects of being Department Head is finding time to pursue research projects. I've been fortunate to work with excellent colleagues and students. They motivate me and provide great ideas. Here, I will describe my favorite research project: studying student learning and attitudes when performing experiments in a virtual lab. I led several projects developing and investigating the use of virtual chemistry labs. I hope to restart this project soon.

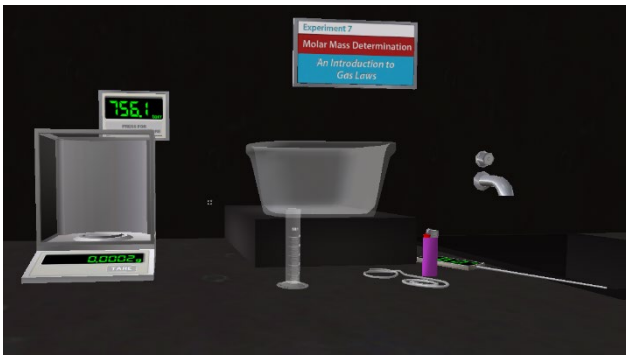
Why virtual lab Experiments?

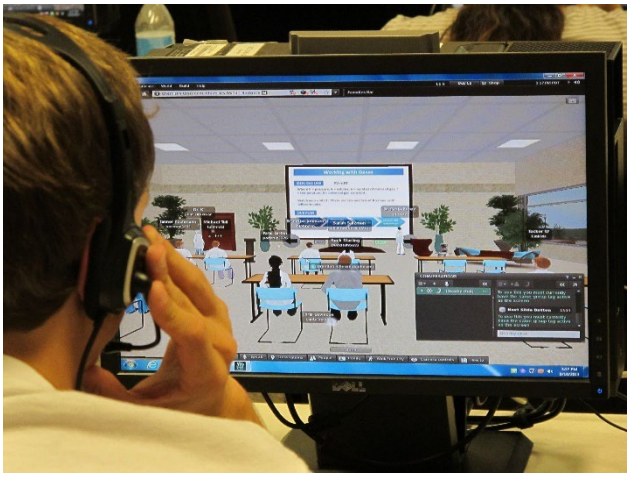
Virtual labs have many potential benefits. Since they perform all work online, students can conduct experiments that are very educational but too expensive or unsafe to conduct in a real lab. Students have many obligations besides the classes, so virtual labs allow them to complete their work on their own schedule. A virtual lab can be designed to alleviate the tedium of some steps in an experiment – there's no need to wait 10 minutes for the virtual water to start boiling in a virtual beaker. Virtual labs are novel and can get students more interested in science than an ordinary chemistry experiment. As we learned during the pandemic, the ability to teach remotely can allow schools to continue teaching even during an emergency.

You've probably already thought of some reasons why they might not work. For instance, can students learn chemistry without holding a real beaker or turning a valve on a real buret? Do they learn anything by "playing" chemistry lab on a computer? We had the same questions, too.

Designing virtual lab Experiments

Students performed experiments in an online lab built in a 3D virtual world called Second Life (see images below). Second Life is free to use and gives users the feeling of immersion within the 3D world. Each user can control and customize a digital version of themselves, called an avatar, using a keyboard and mouse. They can see and interact with other avatars in the virtual world.





Top Figure: The virtual lab bench that students see within Second Life when they perform an experiment to determine the molar mass of butane gas.

Bottom Figure: A student sits in a real computer lab while participating in a pre-lab briefing in Second Life.

Students work together to complete virtual experiments, just as they would in the real lab. Learning is easier when you do it with other people – it's a social experience, regardless of whether learning occurs in the real or virtual world.

Project Outcomes

For our initial project, high school students performed a virtual titration that matched the real-world protocol visually and procedurally. Their post-lab report grades matched those from hands-on labs, and surveys showed that students thought that the virtual experiment was equally challenging and enjoyable compared to a real-world experiment.

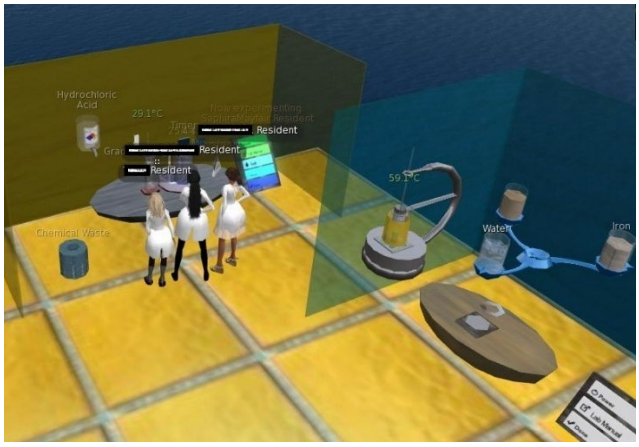


Figure: A lab setup for high school students.

In a follow-up study, hundreds of Texas A&M students conducted real and virtual versions of lab experiments. Students completing the virtual experiments earned equivalent or even better quiz and practicum grades compared to peers conducting the same experiments in real-world labs. Also, their satisfaction was equally high. These findings support the idea that well-designed virtual labs can effectively substitute for in-person lab experiences. My collaborator, Dr. Wendy Keeney-Kennicutt at Texas A&M, gave a YouTube presentation about learning chemistry in Second Life that includes results from of our project.

While these results are promising, students' feedback about their virtual lab experience brought to light some issues to consider. For instance, while students performing virtual lab experiments demonstrated equal learning compared to students completing the real-world version of the experiment, *they didn't think that they learned as much*. Completing the virtual experiment did not give students the same level of confidence as they get when learning in a real-world setting. Students also remarked that waiting around for the water to boil was not necessarily a bad thing – they got to talk with their friends, reread the procedure, and relax so that they are mentally ready for the next part of the experiment. When asked whether they would prefer virtual or real-world experiments, most students expressed a desire for a mix of the two.

We also discovered practical drawbacks to virtual lab experiments. It is easier to modify the procedure of a real-world experiment at the last minute compared to reprogramming an experiment in a virtual setting. Virtual labs are also expensive to design but could save money over time since there are no chemicals to buy and chemical waste to dispose.

In summary, we have found that college students learn both concepts and hands-on skills just like they do in a real-world lab. Students enjoy their virtual lab experience.

In addition to addressing the challenges noted above, our future work will focus on students' learning and attitudes when conducting virtual experiments in virtual reality (VR). Our previous work was conducted 10 years ago, before this technology was mature. Now, VR is less expensive and more widely used in gaming. VR users have a more immersive experience and can manipulate virtual objects with hand-held controls, rather than using a mouse and keyboard. We would like to understand how VR technology affects student learning in a virtual chemistry lab.

Congratulations to Our Graduates!

We celebrated seven Chemistry majors becoming our newest alums last year! As you know, a Chemistry degree is challenging enough but many of these students began college at the height of the pandemic that disrupted learning and campus activities for over a year. We are very proud of them!

Graduates and their families attended a catered lunch prior to the graduation ceremony. It was fun to see the students one last time and meet their parents and siblings.

Students were exuberant about their achievement, parents were thrilled that their children reached this milestone, and faculty were gratified that students really did pay attention in class, after all. There was even a noisy chemistry demonstration afterwards, otherwise known as a fireworks show.

Summer 2024, Fall 2024, and Spring 2025 Chemistry Graduates:

Jacqueline Joyce Farmer

Kaylee O'Quinn (Summa Cum Laude)

Jordan E. Flemming

Airionna Sincere Fordham

Carlton W. Francis II

Karli Marie Icard

Mikayla Natasha Wright

Congratulations to all our new graduates!

Show your Support

Would it be a department newsletter without an appeal for your support? You can make a difference with VSU Chemistry. Giving is easy and all donations benefit our students. Donations from generous alums like you provide financial support for student awards, fund undergraduate research projects, and enable students to attend research conferences. These are just some examples of how your giving positively impacts our students. Imagine all the ways that your donation can help.

To make a donation, visit VSU's website https://community.valdostastate.org/give. In the Designation section of the form, select Other and indicate the Chemistry Account number and account name for your donation to help the Chemistry program. Here are some options for giving:

#20063 Chemistry supports students with awards, travel to research conferences, outreach events like Science Saturday, and other important activities.

#20067 Manning Chemistry Research Fund supports research by Dr. Tom Manning and his students.

#20070 SMACS supports the Student Members of the ACS organization.

#20066 Dr. M. Elizabeth (Betty) Derrick Scholarship Fund provides an annual award to outstanding female Chemistry majors. The fund was established in memory of Chemistry Professor Emeritus Dr. Elizabeth (Betty) Derrick.

#20071 Jim and Judy Baxter Chemistry Student Scholarship Endowment will fund annual scholarships for academically talented, first-year Chemistry students. Scholarship funds come from the interest and earnings of this endowment so that the principal remains, allowing it to fund new scholarships each year. *Dr. and Mrs. Baxter are generously matching every donation to this fund, up to $10,000.*

No donation is too small - just $100 allows us to give an award each year to a deserving Chemistry student or pays for a student's meals at a research conference. Every donation makes a difference.

A more generous donation can fund a special project for helping our students and improving their experience at VSU. I am sure that you have lots of great ideas. Please share them with me or your favorite faculty member. We look forward to working with you to support our students.

Stay in touch with us using the links below. VSU Chemistry alumni have their own private Facebook page. Email us so that we can add you to that group. Send us a note about what you're up to and your recent accomplishments. We always love to hear from you. If you are ever near Valdosta, it would be my pleasure meet you for lunch and chat about your time at VSU.

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Thank you for reading! I hope you have enjoyed learning about the activities and accomplishments of our Chemistry students, alumni, and faculty. Please stay in touch and …

Go Blazers!