



DEPARTMENT *of* CHEMISTRY

VALDOSTA STATE UNIVERSITY

2021 Chemistry Newsletter

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

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From the Department Head's Desk

Greetings, Blazers! I hope that you and your family are safe, healthy, and happy during this summer. You will read in this Newsletter that despite the challenges of the past year, the VSU Chemistry Department continues to thrive and find new ways to help our students achieve their goals.

It's hard to believe that just one year ago, I began my career as Chemistry Department Head, succeeding the highly respected Dr. Jim Baxter. Those are big shoes to fill. I joined VSU because I believe in its mission to transform the lives of undergraduate students through education. Dr. Baxter retired from a Chemistry Department that is widely recognized and admired for its dedication to teaching and student success.



We will build upon this foundation to help chemistry students pursue careers in medicine, pharmacy, research, teaching, and other fields. I hope to attract more chemistry majors to our program and expand their scholarship and internship opportunities. Faculty will continue to mentor and support student research. Like me, many of you discovered a love of chemistry while working in a lab. It's a critical part of a student's education. Of course, we will continue providing students with an excellent classroom education as well.

Another goal is to connect with our alumni. You are a vital part of our Chemistry community. We share news about faculty and students in the News and Media section of our website (www.valdosta.edu/chemistry) and on social media. Student Members of the ACS (SMACS) are active on social media (www.facebook.com/smacsvsu/ and www.instagram.com/smacsvsu/) and VSU Chemistry alumni have their own private Facebook page. Send me an email (kwinkelmann@valdosta.edu) so that we can add you to that group. I will be working with VSU's Alumni Relations Office to get in contact with you, but why wait? Send us a note about what you're up to and your recent accomplishments. The faculty would love to hear from you.

I hope this Newsletter reminds you of fun times spent at VSU making friends and learning chemistry. If you are ever near Valdosta, it would be my pleasure to meet you to hear your thoughts about VSU Chemistry. Whether it's a visit, email, or Zoom (are we all sick of Zoom yet?), please stay in touch.

Best wishes and Go Blazers!

A handwritten signature in black ink, appearing to read 'Kurt Winkelmann', with a long horizontal line extending to the right.

Kurt Winkelmann
Professor and Department Head

Recent Department News

Here are the latest activities taking place at VSU's Chemistry Department.

Pharmacy School Recruitment

Pharmacy schools recognize that VSU Chemistry graduates are outstanding, so they want to increase recruiting efforts for their Doctor of Pharmacy (PharmD) graduate programs. Thanks to a new agreement between VSU Chemistry and Philadelphia College of Osteopathic Medicine (PCOM), our pre-pharmacy majors can now enter the PCOM School of Pharmacy after just three years of classes at VSU. Their first year of PharmD courses transfer back to VSU so they earn their VSU Chemistry degree while also completing a PharmD degree at PCOM. This saves Chemistry students a full year of tuition and time as they reach their academic and professional goals. PCOM is the first school to approach VSU with this opportunity. We expect that other pharmacy schools will make similar arrangements.

New Faculty and Promotions

In the past few years, the VSU Chemistry Department hired two new faculty (**Drs. Gopee Sreenilayam** and **Xiaomei Zheng**) and a new Department Head, **Dr. Kurt Winkelmann**. We are excited to announce that **Dr. Shipra Gupta**, an organic photochemist, is joining us in August 2021. You can read about the newest Blazer faculty in the Chemistry Faculty Updates section.

We celebrate the success of our faculty. VSU promoted **Dr. Ligia Focsan**

from Associate Professor to (full) Professor, the highest faculty rank, and **Dr. Xiaomei Zheng** from Instructor to Lecturer. Congratulations to both!

Retirements

In 2019, **Dr. Gary L. Wood** retired after 30 years of service at VSU. Dr. Wood taught introductory and inorganic chemistry courses at VSU for many years and mentored many undergraduate research students. His research in synthetic inorganic chemistry yielded more than a dozen peer-reviewed journal articles and several patents. He now enjoys retirement in Texas.

Dr. Jim Baxter retired from VSU in 2020. With almost 50 years of service, Dr. Baxter was the longest serving faculty member at VSU. He is a Valdosta State College alumnus (Chemistry, 1966). After earning a PhD from Georgia Tech, he returned as a faculty member in 1971. He began serving as Head of the Chemistry Department in 2002. Dr. Baxter had a positive influence on countless students, both in his classes and the Chemistry majors that he mentored. His faculty colleagues appreciated his friendly, supportive spirit and his dedication to students. You can read Dr. Baxter's thoughts about his time at VSU in this Newsletter.

After 13 years as a VSU Chemistry faculty member, **Dr. Art Jonas** retired in 2020. He taught first-year chemistry lectures and organic labs. "Retirement" might be too strong of a word since he continues to teach VSU courses part-time. Dr. Jonas shares his thoughts in this Newsletter also.

New College and Dean

In other news, the College of Arts and Sciences has become the College of Science and Mathematics (CoSM) and the College of Humanities and Social Sciences.

Dr. Pierre-Richard Cornely joined VSU as the new Dean of the College of Science and Mathematics. Dr. Cornely recently served as the Chair of the Division of Science and Technology and Professor of Engineering at Eastern Nazarene College, in Quincy, Massachusetts. He received his Doctor of Engineering degree in Electrical Engineering from the University of Massachusetts, Lowell. Dr. Cornely has served in senior positions in both

academia and industry, including as President and CEO of 374's Electric Power Corporation, where he developed the first generation of surf hydroelectric systems. His scholarly activity includes earthquake forecasting, as well as innovations in enrollment management and recruitment, curriculum development, and novel models of cross-disciplinary collaboration. Dr. Cornely has also worked with the U.S. Department of Defense as a Senior Research System Engineer and as a Senior lecturer at the Raytheon Learning Institute (RLI). He also served as Chair of the Radio and Communication Propagation and Atmospheric Physics Group at Raytheon, in Waltham, Massachusetts.

Meet an Outstanding Alum

Accomplishments of our alumni always impress and inspire our students and faculty. We will feature as many as possible in future Newsletters, so feel free to nominate an outstanding Chemistry alum. For this Newsletter, we shine a spotlight on **Dr. Caley Allen**.

Dr. Allen graduated VSU with Bachelor's of Science degrees in Chemistry and Physics in 2008. She went on to earn her PhD in 2013 at Auburn University studying computational chemistry. She returned to Georgia to work as a Kimberly Clark Postdoctoral Scholar at Georgia Tech, then moved to Johns Hopkins University as a Research Scientist. She is currently the Education and Diversity Programs Manager of the Biological Engineering Department at MIT.



At VSU, Caley Allen worked with Dr. Tom Manning, coauthoring four publications related to computational chemistry. Caley was passionate about her work, learning the software and the nanoscale chemical systems that they studied. As Dr. Manning recalls, “Caley was always ready to work and had a very positive and cheerful attitude. She was an absolute pleasure to work with!”

She showed her leadership skills and work ethic early in Dr. Manning’s physical chemistry class. Under his supervision, she helped students develop an in-class exercise into a published journal article.

She and Dr. Manning coauthored *Chemistry in a NanoDrop*, which examined how the properties of different solvents change inside in a nanosized droplet of liquid. Her presentation of this work earned Caley second prize at a regional ACS meeting.

Caley helped develop and publish some of the first chemical exercises using cell phones in a classroom. VSU faculty used these activities in their classes. She was a coauthor and driving force in completing and testing computational exercises that are featured in the book *Computer Based Projects for a Chemistry Curriculum*. This work grew out of Dr. Manning’s involvement in a ten-year collaboration between the American Chemical Society, the University System of Georgia, and the University of Havana in Cuba. These publications proved to be especially helpful during the COVID-19 pandemic when college chemistry lab courses shifted to an online learning environment.

Caley worked at Auburn University with PhD advisor Dr. Orlando Acevedo studying computational and theoretical

chemistry. She performed quantum mechanical and molecular mechanical calculations to study organic systems and ionic liquids. Her research in Professor Rigoberto Hernandez’s lab at Georgia Tech and Johns Hopkins University investigated larger scale structures, such as cytochrome c interactions with lipid bilayers.

At MIT, Dr. Allen manages the Education and Diversity Programs in the Biological Engineering Department, coordinating many science and engineering community outreach activities. She collaborates with dozens of faculty and over 100 program trainees. Dr. Allen leads multi-million dollar projects involving multiple universities, such as a Research Experiences for Undergraduates (REU) program within the Center for Emergent Behaviors of Integrated Cellular Systems. She developed and oversees the BEEAM (Broadening Engagement through Engineering At MIT) program, which provides year-round education and research opportunities for junior and senior students at local high schools. The goal of BEEAM is to attract and strengthen students’ interest in science and engineering. Her work is funded by the National Science Foundation, National Institutes of Health, and other funding agencies.

We look forward to sharing with you more stories about our graduates making a positive difference in science and their community!

Messages from Our Retired Faculty

Dr. Art Jonas

I joined the Chemistry Department as an adjunct professor in August 2007 and retired in August 2020. Mostly, I taught freshman chemistry and organic laboratories. In the summer terms I sometimes taught science for educators. My time at VSU was most satisfying and fulfilling. I especially enjoyed engaging and mentoring my students. I have many great memories of wonderful students and I sincerely wish all of my students the very best.

Since retiring from the Chemistry Department, I continue to teach science for primary and secondary education majors. These education courses are an introduction to physics and chemistry.

Now I relish life with my wife of 55 years and my son who lives with mom and dad and visiting with my daughter and her family in North Carolina. I enjoy being with nature while fishing and gardening (both vegetables and flowers). My neighbor and I pick wild blackberries when in season (early June). My family and I enjoy traveling and visiting the Georgia state parks. Before the Covid shutdown, we took an Alaskan cruise out of Seattle. We anticipate going on a cruise through the Panama Canal when the travel bans are lifted.

Dr. Jim Baxter

I was asked to share some thoughts with you after my professional career has ended. I taught at VSU for 47 years. I have now been retired for 13 months. Judy and I are doing very well. I now have

time to do things such as working out, driving cars, riding my motorcycle, fishing. Judy does most of the traveling, I do a little.

I also think back to the years that I worked at VSU. Do you know what I believe to be important? People. New buildings, laboratories and instruments are important; but people are most important. I think about the professors that I had at VSU and Georgia Tech. Also, the students that I taught and the faculty members that I worked with come to mind. A few months ago, I met, while in a surgical suite, a nurse that I had taught 35 years ago. I was glad to have had a small part of her success as a student and nurse.

To current students, continue to work hard. You have good professors who care about your success. Remember, the hard work that you now do weighs ounces, while regret weighs tons. Do not look back at the end thinking what might have been.

To alumni, I am very proud of you. Whatever you may be doing, I know that you are serving your community and family well. If possible, visit the VSU Chemistry Department. The faculty would love to see you.

To faculty, you are the heart of the Chemistry Department. Each one of you has a unique strength. When you work together you create a strong department that produces strong graduates. Being a teacher is not just a vocation, but a calling. Your students will remember you all their lives. I know that I will.

Student Award Winners

Join us in congratulating our 2020-2021 Chemistry Student Award winners. Chemistry faculty select each award recipient and it is always a difficult choice due to the strong competition. The College of Science and Mathematics held its awards ceremony on April 21 face to face and also broadcast on Facebook so that family and friends could participate.



In addition to our students receiving many Chemistry Department awards, the College of Science and Mathematics selected Chemistry major Nathan Hart for the college's Outstanding Student Award. Congratulations Nathan!

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

Physical Chemistry Award	Nathan Hart
Analytical Chemistry Award	Alana S. Hiers
Biochemistry Award	Taylor Wilson
Inorganic Chemistry Award	Thomas Falkenhausen
Organic Chemistry Award	Shaun W. Anderson, Jr.

The Chemistry Department recognizes many other aspects of student excellence with the following awards, including research, service to the Department, and academics. The winners of this year's awards are:

Freshman Chemistry Award	Hannah Michael
American institute of Chemists Award	Nathan Hart
Southwest Georgia ACS Optima Chemical Award	Brooke Wiggins and Danielle B. McKay
Dr. M. Elizabeth (Betty) Derrick Award	Estefani Quinones
Chemistry Undergraduate Research Award	Kayla R. Mills (Nease)
Outstanding Chemistry Senior Award	Thomas Falkenhausen

We asked each awardee to tell us their future plans, favorite VSU class, and their extracurricular activities. Here are their responses.

Alana S. Hiers

Analytical Chemistry Award

I've been accepted to the University of Georgia to pursue my PhD in Chemistry. My favorite chemistry class has been Instrumental Analysis with Dr. Manning. I've been involved with SMACS, the Honors College, and I've been a Chemistry Tutor with the ASC since January 2018.

Shaun W. Anderson, Jr.

Organic Chemistry Award

After Graduation I plan on getting my Master's degree then continue my education to Medical school as I aspire to become an Anesthesiologist. My favorite class at VSU was Medicinal Chemistry with Dr. Manning because it involved dealing with the different uses and origins of drugs, on the molecular level how these drugs are assembled and arranged, and how they have such good and bad impact on our bodies. During my time at VSU I was involved in research

involving antibiotics/cancer drugs, the ACS, Black Student League, and the NAACP - all great organizations and great networking opportunities. I highly recommend and you learn, get different perspectives, and get the opportunity to have those uncomfortable conversations in the world we live in today.

Nathan Hart

American institute of Chemists Award

Physical Chemistry Award

College of Science and Math Outstanding Student Award

I have been accepted to attend the University of Florida for a PhD program in analytical chemistry. My favorite class at VSU was Quantitative Analysis with Dr. Linda de la Garza. I did research in the Chemistry Department for Drs. Duncan and Sreenilayam. I also published a journal article in the ACS *Journal of Chemical Education* with Dr. Linda de la Garza. In addition, I was a member of the SMACS club on campus.



Alana Heirs



Shaun W. Anderson, Jr.



Nathan Hart

Brooke Wiggins (Co-winner)

Southwest Georgia ACS Optima Chemical Award

I am a senior chemistry student at VSU. My plans after graduation are to attend Mercer College of Pharmacy in August 2021. My favorite class at VSU was Biochemistry and lab with Dr. Gosnell and Quantitative Analysis with Dr. De la Garza. I was involved in SMACS, Wesley campus ministry, as well as president of the pre-pharmacy club. Thank you very much!

Danielle B. McKay (Co-winner)

Post-graduation, I plan to pursue a career as a Cosmetic Chemist. My favorite class at VSU was biochemistry. During my time at VSU, I participated in research under the mentorship of Dr. De La Garza. Our project was entitled "Spectroscopic and Electrochemical Characterization of Iron (III) Oxide Based Electrodes for Photo Electrochemical Cells." I am also serving as the President of the Student Members of the American Chemical Society.

Hannah Michael

Freshman Chemistry Award

After graduation, I will likely take a gap year or pursue a Master's, after which I will apply to medical school. My favorite class at VSU was Calculus 1 with Dr. Charles Kicey.

Estefani Quinones

Dr. M. Elizabeth (Betty) Derrick Award

I am a Junior and am debating my options. As of right now, after graduation I plan to get an internship and take a gap year between undergrad and graduate school. If I do not get an internship, I plan on going to graduate school after VSU. My favorite class at VSU is Environmental Chemistry, I loved the hands-on experience and real-world problems discussed in the course. I am part of the 2018-2019 CAMP alumni; I was in the program freshman year. During my time at VSU, I was involved in Latin American Student Association (LASA), Habitat for Humanity, and participated in other community service projects around campus.



Brooke Wiggins



Danielle B. McKay



Hannah Michael

Kayla R. Mills (Nease)
Chemistry Undergrad Research Award

My post-graduation plans are to attend pharmacy school at South University in Savannah. My favorite class at VSU was medicinal chemistry with Dr. Manning. I participated in SMACS and served as president in 2019-2020. I participated in pre-pharmacy club and was the pre-pharmacy event coordinator in 2019-2020. I conducted cancer drug research with Dr. Thomas Manning.

the Student Chair of Valdosta State Pride Connection, and a tutor, SI Leader, and Senior Mentor at the Academic Support Center. I supported courses from Math, Biology, and Chemistry. I have been a part of two professors' research teams and presented my research at the Georgia state capitol, the Georgia Undergraduate Research Conference, and National Conference on Undergraduate Research. My experience here at VSU has been amazing!

Thomas Falkenhausen
Outstanding Chemistry Senior Award

My plans after graduating in the fall will be to apply to graduate school to further pursue a doctorate in biochemistry. My favorite courses would have to be Biochemistry 1 and 2 with Dr. Woldman. I really enjoyed learning about how complex the chemistry of life can be! I am currently



Kayla R. Mills (Nease)



Thomas Falkenhausen

Chemistry Faculty Updates

Chemistry faculty actively engage in teaching, scholarship and service to VSU, the Valdosta community, and their profession. They share their latest interests and accomplishments.

Dr. John Barbas



I teach organic chemistry. I use the mechanistic approach for a better understanding of the concepts of how and why reactions proceed. I have written several of the organic chemistry experiments which students do. These experiments are designed to reinforce the concepts that the students learn in the lectures, experiments that are safe, and proceed to give good yields of products. We use micro techniques as we have done for years to minimize waste. For each experiment we use modern instrumental techniques for the analysis of products. This includes IR, GC-MS, proton and C-13 NMR, and polarimetry for chiral natural products. We also use molecular modeling extensively. This approach better prepares students for graduate school, medical school, pharmacy, and industry.

My area of research is in free radical reaction mechanisms. Since this work requires high vacuum, I had to adapt for what can be done more easily with undergraduates. In recent years, my research has focused in the area of green and economical methods for the synthesis of unique chiral imines and chiral amines. In keeping with the green chemistry concept, we use activated silica as a medium for a two-step synthesis. This minimizes solvent use. We developed two reactions: the first to form the imine and the second to form the amine are run in the same flask. We have synthesized a large number of new novel chiral imines and chiral amines quantitatively. There are no other by-products in the first step or the second step. Many of these reactions are between aromatic aldehydes and primary chiral amines. Both steps require the presence of silica. We have used electron donating, electron withdrawing, and bulky substituents on the aldehyde. Some of these groups are used extensively in pharmaceutical synthesis. These reactions take place in minutes at ambient temperatures. No energy is wasted. The enantiomeric purity of the products is over 98%. We believe this is the most economical and green method to make these compounds. The simpler the steps, the better the reactions. The analysis of the products is done by IR, GC-MS, and proton and C-13 NMR, and polarimetry. We have obtained the specific rotation of a large number of new imines and new amines that can be used as catalysts or intermediates to make larger chiral molecules. This research experience prepares students very well for more advanced studies.

Dr. Linda de la Garza



Dr. Linda de la Garza, Associate Professor of Chemistry, received her doctorate in Chemistry from Arizona State University in Tempe, AZ. She worked as a post-doctoral appointee at Argonne National Laboratory, located in the Southwest Chicago suburbs.

Dr. de la Garza received the VSU College of Science and Mathematics Closing the Loop Award and was named Teaching Scholar for Fall 2020. She also published an article with two chemistry students, "Electrochemical Quantification of Acetaminophen: An Engaging Cyclic Voltammetry Laboratory for the Quantitative Analysis Course" (Hart, NT, Lane, WC, de la Garza, L., *J Chem Educ* 2020, 97(8), 2254-59). During 2020, her students presented six posters at regional meetings. Dr. de la Garza received a \$5,000 grant for the Blazer Summer Research Institute for Summer 2021. Her research interests involve the study of properties of semiconductors at the nanoparticle level using a variety of spectroscopic and electrochemical techniques in order to provide insights on the fields of energy conversion and catalysis.

In addition to her teaching and research excellence, Dr. de la Garza is a VSU Leadership Academy Scholar (2019-2020) and past President (2019-2020) of MESA, a faculty and staff group focused on Hispanic/LatinX students at VSU. She is currently serving as VSU Faculty Senator (2019-2021), SMACS advisor, and Councilor of the Southwest Georgia Local Section of the American Chemical Society (2021-2023). Dr. de la Garza is also part of the NSF-sponsored Southwestern Georgia STEM Pathways Louis Stokes Alliance for Minority Participation (LSAMP), collaborating as Data Liaison and Research Coordinator for the VSU LSAMP program.

Dr. Dean Duncan



Dr. Duncan's research group made progress on establishing synthetic protocols for tethering two polyoxotungstate anions together and for general procedures on purifying organoimido-functionalized polyoxotungstates isolated as tetra-n-butylammonium salts. Publication is pending on the successful structural characterization of these salts by single crystal x-ray diffraction.

Dr. Duncan also restructured the introductory chemistry courses for non-science majors to better reflect the needs of students taking these service courses for the Allied Health Sciences. As an integral part of this restructuring, Top Hat – an online teaching platform – is used for lecture presentation that includes student engagement via online responses to questions during lecture and seamless virtual instruction that proved helpful during the COVID-19 pandemic. He also developed online labs for introductory chemistry.

Dr. Ligia Focsan



As an international chemistry professor, I take pride in working at VSU, an inviting institution where I always feel at home and accepted. Since joining the VSU's diverse faculty and student body in August 2011, I have diligently worked toward effective teaching, significant research, and meaningful service.

I teach the sequences for introductory chemistry for non-science majors (Survey of Chemistry CHEM 1151K and CHEM 1152K) and science majors (Principles of Chemistry CHEM 1211 and CHEM 1212), Physical Chemistry, and

computational chemistry as an elective. More than just teaching chemistry, I strive each day to encourage students to truly engage themselves in the pursuit of knowledge, to learn how to study, to experience all the related feelings in the process so that in the end, they love studying and knowing. It is for most a very difficult path, but in my opinion, it is the most secure path towards great rewards in life. *There are many paths to success, but education is the most secure of them all.*

Besides teaching, I have involved many students in carotenoid research. Carotenoids are pigments in plants similar to chlorophyll, that are involved in photosynthesis. I author and coauthor high-quality papers published in peer-reviewed journals and attend regional and international conferences on the topic. I like doing research but what I love is teaching (others to do research, to always seek for knowledge).

Dr. Donna Gosnell



The last year has been a busy one, especially with changes that the pandemic has imposed. On the teaching front, I have “flipped” some of my

classes, which means lectures are recorded and class time is used for problem solving, etc. This also helps to accommodate many students who are attending at least partially online. It is a teaching model known to be effective, and I have wanted to try it for some time. The pandemic actually forced me to learn many new tools for online teaching, which allows me to be more flexible in my approach to my classes.

On the research front, I continue work on the linear dichroism of small molecules embedded in stretched films. Beyond general research goals, this project is helping me to introduce the topic of anisotropic samples into Pchem 2. Last fall the pandemic shifted my research toward computer modeling, and a student and I began a project to examine peptide nucleic acids (PNAs). PNAs are synthetic mimics of DNA (or RNA) that replace the sugar-phosphate backbone with a pseudo-peptide polymer. These are known to base pair to DNA or RNA, but many of their properties and uses remain to be discovered. We are examining the thermodynamic stability of PNAs and PNA:RNA (or DNA) hybrids using SPARTAN and other modeling programs.

On the home front, I am still an active gardener and musician. My last garden had the best kale ever and I hope this year is good growing season for strawberries. In summer of 2020, there was some excitement with alligators taking residence in my pond. One was about 6 foot and the other only a baby, but I spent a bit of time watching them with binoculars. Hopefully, they will stay in Grand Bay, which abuts my property!

Dr. Shipra Gupta



I am a photochemist. My research focuses on deftly using light energy to study complex intermolecular interactions, controlling highly reactive chemical species and successfully manipulating reactivity of organic molecules. The central idea is to promote the use of renewable/inexhaustible energy sources and an environmentally friendly solvent (water!) in carrying out chemical reactions. My current research focuses on using alternate photochemical pathways to efficiently synthesize biologically and industrially relevant compounds, designing sustainable materials using photoactive groups and natural resources like cellulose, using novel photo-click reactions in the synthesis of smart hydrogels, and using supramolecular photochemistry and photophysics to study and design efficient synthetic routes for medically relevant compounds.

I obtained my bachelor's degree from Isabella Thoburn College, India, with a major in Physics and Chemistry. I was fortunate to acquire my Master's degree in Chemistry from a prestigious institute – Indian Institute of Technology (IIT-G). I started my research as an Indian

Academy of Science Fellow synthesizing peptides (used for protein studies) at Indian Institute of Sciences, Bangalore, with Prof. S. Chandrashekharan. I was introduced to supra-molecular host guest photochemistry at University of Miami, where I pursued my PhD degree. I have had an extremely rich research and teaching experience working with two world-renowned photochemists during my PhD (Dr. V. Ramamurthy) and postdoctoral studies (Dr. Jack Saltiel). Under their mentorship, I honed my research skills and gained experience teaching and conducting research alongside undergraduate and graduate students with a wide variety of socio-educational backgrounds and future aspirations, eventually earning the Best Teaching Award.

A meaningful, positive contribution to our society is my driving passion. In my leisure time, you will find me absorbed in learning, trying to master new concepts, and finding innovative ways to help people and causes around me.

Dr. Tom Manning

Dr. Manning's research covers several areas that include drug development, marine chemistry, and chemical education. You can read more about his research in our Faculty Spotlight.

Dr. Tolulope Salami

My research interests are in material science, natural products, and chemical education.



Our current focus is on porous materials with cationic and anionic hosts that can be used in sensor applications and drug delivery. We are currently developing a fabric sensor that has potential use in chemical recognition.

Naturally occurring bioactive phyto-compounds are ubiquitous in most tropical plants and many of these plants are available in large quantities. Our area of interest is in the purification and characterization of bioactive compounds from these tropical plants. These bioactive compounds have potential medicinal uses.

We also work extensively in chemical education research, specifically in the development of project-based upper-level chemistry laboratories and the development of new strategies for improved instruction.

I enjoy teaching upper division and lower division courses. I utilize and incorporate various teaching pedagogies in my courses. I teach the following courses: Inorganic Chemistry, Advance Inorganic Chemistry, Principles of Chemistry I (lecture and lab) and Principles of Chemistry II (lecture and lab). I also teach a special topics Biomaterial Chemistry class.

Dr. Gopeekrishnan Sreenilayam



Gopeekrishnan (Gopee) Sreenilayam completed his PhD with Prof. Gregory Friestad in 2011 (synthetic organic chemistry) from the University of Iowa. He then did postdoctoral research with Prof. William Wuest (currently at Emory University) at Temple University, Philadelphia in medicinal chemistry from 2011-2013 and a second postdoc with Prof. Rudi Fasan at University of Rochester in biocatalysis from 2014-2017. Gopee started his independent academic career as a visiting assistant professor at Indiana University South Bend from 2017-2018 and moved to Valdosta State University in fall 2018 as a tenure-track assistant professor. At Valdosta State University, Prof. Sreenilayam teaches organic chemistry I & II and the senior seminar course.

Prof. Sreenilayam is very active with undergraduate research and a member of the Valdosta State University undergraduate research council. The Sreenilayam research lab is focused on developing protein-polymer nano constructs as reusable biocatalysts in non-aqueous media. Our lab is also interested in green chemistry projects such as carbon dioxide mitigation using algae beads and developing organic cross-coupling reactions in nontoxic, bio-

degradable, and reusable deep eutectic solvents.

Besides research, Prof. Sreenilayam is actively participating in professional service and community outreach programs. Last year, Gopee served as the chair of the American Chemical Society local section (SOWEGA). Outside of work, Gopee enjoys spending time with his wife and two kids (6- and 3-year-old), as well as watching movies, hunting, and fishing.

Dr. Kurt Winkelmann



I joined VSU as the Chemistry Department Head in July, 2020. Prior to this, I was a Chemistry faculty member at Florida Tech for almost twenty years. I attended Virginia Tech (Go Hokies!) as an undergrad and Auburn (War Eagle!) for my PhD in semiconductor photocatalysis.

Now I am busy setting up my research lab, getting to know my new chemistry colleagues, and teaching wonderful VSU students. I teach the general, organic, and biochemistry survey course for health science students. As a physical chemist, that teaching experience has

required me to brush up on a lot of organic chemistry that I thought could be safely forgotten!

Most of my recent research has been in the field of chemical education with emphasis on student learning in virtual lab environments and curriculum development for nanotechnology courses. Undergraduates have made significant contributions to my past research and I am excited to involve VSU students in my research now.

We have conducted a research project with students learning in the computer-based, virtual world of Second Life. Students performing virtual lab experiments learn as much, if not more, than in a real world lab. These are exciting results, especially given the new importance of remote and online learning. We are now interested in how a student's experience in virtual reality can impact learning and attitudes about chemistry.

Nanotechnology is the study of materials on the nanometer scale. At that particle size range, substances have different chemical and physical properties. For instance, elemental gold has a lower melting point, higher reactivity, and even a different color (wine-red or grayish blue, depending on the exact particle size). I am interested in how we can teach these fascinating nanoscale phenomena to students even in their first-year chemistry lab course.

When I am not teaching, researching, and department heading, I like to spend time with my wife and daughter, watch football, meet new Valdosta friends, and enjoy our new community. We look forward to visiting new places and discovering local restaurants.

Dr. Yakov Woldman



Hello, reader! My name is Yakov Woldman. I got my undergraduate and graduate degree in chemistry from Novosibirsk State University, one of the leading Russian universities in Natural Sciences. I am teaching in Valdosta State now for 17 years, biochemistry and general chemistry lecture and laboratory courses. My teaching principles are based on my belief that chemistry is an experimental science and experiment goes first, only later to be explained by theory. From here is my attention to experimental details in teaching laboratory and my love towards laboratory work with students.

When not attacked by students (ha ha!), I try to do some science, mainly related to the role of active nitrogen- and oxygen-containing species in biochemical reactions. These species play an important role as an organism's chemical defense against invading bacteria and viruses and also work as signal molecules regulating many physiological and pathological processes, from inflammation to neurodegenerative diseases. Every semester I have students working with me on these projects; their work is always presented on the Undergraduate Research

Symposium at VSU and sometimes at regional and national research conferences.

Dr. Xiaomei Zheng



Dr. Xiaomei Zheng received a PhD in chemistry from Wesleyan University in Middletown, Connecticut. Before joining VSU, Dr. Zheng was an assistant professor of chemistry at Albany State University and served as a laboratory and research skills trainer for the NIH RIMI program, as well as one of the co-

PIs for an NSF Supplemental grant to the Targeted Infusion program at ASU.

She joined VSU in 2017 as a lecturer in chemistry, and currently teaches both Principles of Chemistry I and II, and Survey of Chemistry I and II labs. She is the lab coordinator of the Chemistry Department. In this role, she coordinates laboratory activities for first year chemistry courses, she supervises and mentors stockroom student assistants to provide essential services for faculty teaching and students learning, and she provides stockroom student assistants with hands-on training.

In addition to her teaching and service, Dr. Zheng is active in research. Her research interests are in synthesis, characterization, and antibacterial/antiviral activity of phenoxyimine Schiff Base ligands and their transition metal complexes. She has also applied Schiff Base (salen) transition metal complexes along with ZnO nanoparticles in dye sensitized solar cells to improve the efficiency of the solar cells. This research has recently been published in a peer reviewed journal.

Chemistry Faculty Spotlight

VSU's Chemistry faculty embody the dual purposes of a university: to share knowledge (teaching) and create it (research). Learning in a classroom is obviously important but participating in research - the creation of knowledge that did not exist before - is another critical component of an undergrad student's education. In each Newsletter, we will take a deep dive into the research of a faculty member so that you can learn

how students are contributing to the research mission of our Department and VSU.

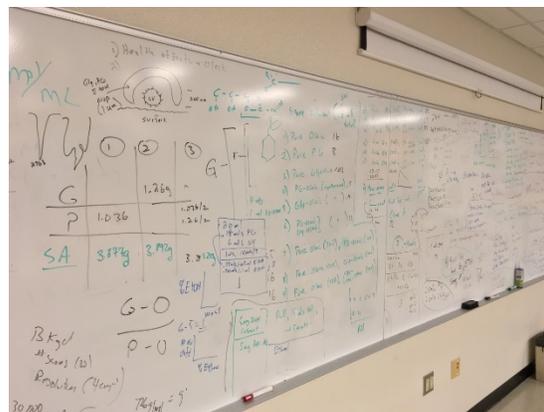
First up is **Dr. Tom Manning**. His research covers several fields, including drug development, marine chemistry, and chemical education. Here are some of his most recent research activities.



We quickly pivoted when COVID struck from tuberculosis (Tb) work to COVID. We developed a novel treatment for the viral infection and this was tested at a medical center in Mississippi on 83 COVID patients. We published two papers that outlined the treatment before the testing. A third paper outlines the testing by the M.D. in Mississippi is in press at this time. The patient tests were very successful. This work attracted lots of media attention, which gave students the opportunity to present their work.



Students and Dr. M were in the lab most days during the pandemic working on their novel COVID treatment. Every day, new instructions, new data, etc. were placed on the board and discussed. A busy time!



Our first paper made it to the WHO web site. There were lots of sub-projects going on with COVID including a EUA to the FDA, a medical doctor in Iran also successfully tested this approach and showed a drop in mortality, a proposal to the health care systems in Brazil and Peru, etc.

We have continued our work with new cancer drugs and are currently using one of them that went through pre-clinical trials at the National Cancer Institute (NCI) for inhalation studies to treat lung cancer and leukemia. The *in vitro* measurements were very good.

We have refined our novel bryostatin synthesis using our technique called pharmaceutical aquaculture (drugs from the sea), where we selectively raise marine bacteria in the ocean that are impossible to grow in a lab. Bryostatin is now considered a potential cure for MS and Alzheimer's but its cost is still at about \$19,000,000 per gram. We have shipped samples to companies and a student group participated in a business pitch contest, hopefully alerting investors in the biotech community to what we are doing.

We continue to do projects in our classes that meet peer review. The Environmental Chemistry class just submitted a completed business plan for

a green building material they worked on. The initial market they are focused on is in tiny houses. The material can be used in place of wall board or can be sprayed on and replace fiberglass. It is a common fatty acid that is extracted from plants but is very hard, safe, and economical. It has excellent chemical and physical parameters for insulation and recycling. We have forwarded the business plan to some timber companies and the Georgia Forestry Commission.

Finally, our oyster and coral restoration projects are doing well. We have developed materials for both critters that is based on green chemistry. We can attract and grow them selectively. We have a NOAA permit in the Keys for the coral work, with a focus on encrusting corals. The picture to the right shows beautiful coral growing on one of the blocks at Pigeon Key in the Florida Keys.

Oyster work along the Atlantic and Gulf coasts continues with our new materials. Oysters are a big deal in environmental engineering. They prevent shoreline erosion, purify polluted water (one oyster can filter up to 50 gallons of water per day), and they are a keystone species (many fisheries are based on oyster bars).



Congratulations to Our Graduates!

We celebrated 16 Chemistry students becoming the newest alums this year! A Chemistry degree is challenging enough but these students also persevered through a pandemic that disrupted learning and campus activities for their senior year. We are very proud of them!

The spring graduation ceremony was face-to-face with social distancing. Students were exuberant about their achievement, parents thrilled (relieved?) that their children reached this milestone, and faculty were gratified that students really were paying attention in class after all. There was even a noisy chemistry demonstration afterwards, otherwise known as a fireworks show.



Congratulations

Emma Lowry McCloskey

Jamie Lynn Grady

Nya Lampkin

Krupa Jitendra Patel

Jael Amari Stanton

Addison Elizabeth Archer

Wali Haamid

Nathan Tobias Hart, Summa cum Laude

Alana Sydney Hiers, Magna Cum Laude

Jacqueline Alexis Holland

Alexis Leake

Kayla Renee Mills

Alaina Suzanne Pope

Brooke LeAnne Wiggins

William Taylor Wilson

Cleanthi Gregory Zuppas



Show your Support

Would it be a school 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 www.valdostastate.org/give/. In the Designation section of the form, select Other and indicate the Chemistry Account number and name in order for your donations to help the Chemistry Department. Here are some giving options:

#20063 Chemistry is our main donation account. It supports student 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 VSU Student Members of the ACS.

#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.

No donation is too small - just \$5 per month allows us to give a nice award each year to an excited and deserving Chemistry student. Donating \$10 per month pays for a student's hotel room at a research conference. It does not take much to make a difference.

I am sure that you have lots of great ideas for helping our students and improve their experience at VSU. Please share them with me or your favorite faculty member. We look forward to working with you to support our students.

Thank you for reading! I hope you have enjoyed learning about the activities and accomplishments of students, alumni, and faculty in *your* Chemistry Department. Please stay in touch and Go Blazers!

Kurt Winkelmann
Professor and Department Head