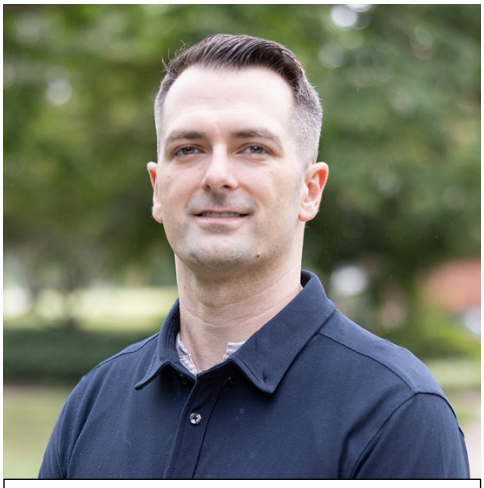
News from the Hampden-Sydney Sciences 2025-26

***Biology* –** by Stephen M. Ferguson

Dr. Stephen Ferguson joined the department in fall of 2025, teaching introductory biology, various physiologies, and neurobiology. After attending the Society for Integrative and Comparative Biology in Portland, OR, in January, he spent most of the spring setting up eastern bluebird nest boxes. Around 40-50 boxes on campus will see use for ongoing research into the effects of artificial light at night in wild birds.

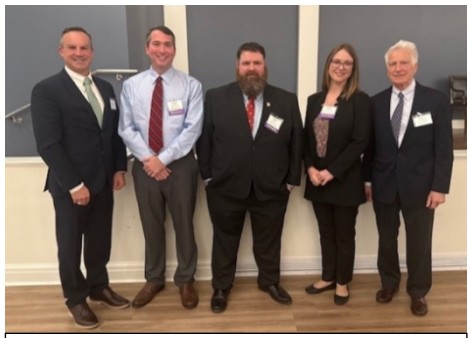


Dr. Stephen Ferguson joined the Biology Department in 2025

Dr. Kristin Fischer has formed a collaboration with Dr. Brittany Taylor's Lab in the Department of Biomedical Engineering at the University of Florida (UF) to work on tendon tissue engineering. The Fischer lab is fabricating electrospun scaffolds made at three different rpms that are sent down to Florida for further testing. Three undergraduate students, Eva Meyler, Diya Rana, and Roni Saffar, at the UF are working on analyzing the electrospun fibers, the scaffold mechanical properties, and the biocompatibility using tendon cells.

With **Dr. Ed Lowry,** invasive species biology has been as relevant as ever during this past year. The research of the Lowry Lab in the greenhouse has moved in fascinating directions with augmented lighting systems in the growth chambers in the Pauley Science Center. Using plant wavelengths closer to what we might find on Mars, **Bowen Charlebois '26** has examined the effects of Martian soil and light on early seedling growth. We have even been constructing our own martian soil to compare to commercial research-grade martian "similant" soil. In lab and in classes we've been growing plants under extraterrestrial conditions, following published work of undergraduate classes at other institutions like Villanova and U Chicago. **John Hurt '26** has been investigating the potential for the fungus-based Boxwood Blight to spread through our local ornamental boxwoods, studying the conditions that promote the sporulation of the fungus that has even been found on our campus boxwoods. We have also been expanding our research to modeling the progress of new invasive species. **Cooper Wendley '26** has been studying the Spotted Lanternfly invasion of North America. His preliminary modeling work has been a fascinating look at the insects' dependence on the already invasive Tree of Heaven. Cooper is starting his masters work at Virginia Tech in the Fall and is collaborating now with a lab at Tech studying the Lanternfly Invasion.

Dr. Scott Starr's lab continued its work on studying local biodiversity of central Virginia invertebrates and expanding the H-SC Apiary. This past summer **Seth Spickard '26** conducted research studying the Palynological Identification of the H-SC Apiary's Pollen Sources. **Isaac Drummond '26** conducted an internship with the Virginia Department of Wildlife Resources studying Post-Storm Population Dynamics of Salmonids in Coldwater Streams of Southwest Virginia Following Hurricane Helene. Isaac continued this research throughout the year for his honors thesis. **Cooper Wendley '26** has worked on research with Dr. Starr and Dr. Lowery focused on Analysis of the Invasive Spotted Lanternfly: Understanding Life History, Government Regulations, and Dispersal Patterns in the United States for his departmental distinction project.



Dr. Scott Starr (center) at the VFIC Awards Ceremony with (left-right) Provost Tim Diette, fellow VFIC awardees Dr. Jake Euteneuer and Helena von Rueden and President Larry Stimpert

The H-SC Apiary has grown to 14 hives, and the Beekeeping club was able to extract, bottle, and sell 80 lbs. of honey. Dr. Starr was honored during the fall semester earning the Harris Rising Star Award from the Virginia Foundation for Independent Colleges. Dr. Starr, Dr. Wolyniak, and colleagues published a paper titled "An Undergraduate-Centered Consortium Approach to Urban Heat Research and Climate Resilience

Action: The Virginia Heat Watch Project." Dr. Starr presented his research to the Heart of Virginia Beekeepers Association and the Nora Lancaster Garden Club of Farmville.

Dr. Rachel Goodman, Elliott Professor of Biology, recently published a peer-reviewed article in the *Journal of Wildlife Diseases* titled *"Use of swab and tissue sampling for detection of Ophidiomyces ophiodiicola* in snakes in Virginia." This work was co-authored with former Hampden-Sydney students Paul Mahaffy, Henry Carman, and Nathan Cabrera, and collaborator Dr. Gaelle Blanvillain. The paper documents the first occurrence of snake fungal disease in central Virginia snakes during 2021–2022, after its absence in earlier surveys, while also comparing sampling methods and providing the largest dataset to date for the understudied Eastern Wormsnake.

Dr. Goodman continues her collaborative research with Dr. Amanda Starr (Longwood University) investigating four emerging infectious diseases—*Batrachochytrium dendrobatidis* (Bd), *B. salamandrivorans* (Bsal), Ranavirus, and Perkinsea—affecting amphibian populations on the Hampden-Sydney campus. This project also examines the amphibian skin microbiome to better understand potential influences on disease susceptibility. The work is conducted in partnership with the Student Network for Amphibian Pathogen Surveillance (SNAPS), a North American citizen-science initiative. Students in the Spring 2026 BIOL 203 Ecology course represent the third Hampden-Sydney class to contribute to this ongoing research.

Dr. Goodman presented this project at the Virginia Herpetological Society Annual Meeting in Fall 2025 and the National Conference on Undergraduate Research in Spring 2026, both held in Richmond, Virginia. She will also present initial pathogen survey results this summer at the 3rd Global Amphibian and Reptile Disease Conference in Knoxville, Tennessee, and begin implementing a new protocols to expand pathogen detection this summer.

In addition, Dr. Goodman will serve as guest faculty this summer with the Amazon Research Initiative for Educators (ARIE), hosted by the Morpho Institute in Peru. There she will help mentor K–12 teachers conducting ecological research in the Amazon while contributing to conservation-focused education and long-term scientific monitoring.

Dr. Kristian M. Hargadon '01 continued work on a number of exciting projects during the 2025-2026 academic year. Among those projects he brought to completion this past year, Dr. Hargadon recently published a bioinformatic analysis of *FOXC2*-correlated genes in melanoma in the journal *Clinical and Translational Discovery*. Featuring former H-SC student **Jeb Wall '22** (now in his 4th year of medical school at Virginia Commonwealth University) as a co-author, the article documents the prognostic significance of *FOXC2* gene expression in melanoma biopsies and highlights the impact of *FOXC2*-correlated genes on several oncogenic pathways and processes. Additionally, shortly after publishing a study on the induction of anti-tumor CD8+ T cell dysfunction in both tumor-free and tumor-involved lymph nodes in the journal *Cancer Reports* last year, Dr. Hargadon received two invitations from other journals for follow-up articles related to this work. First, along with former student co-author **Travis Goodloe '16**, Dr. Hargadon published in the journal *Current Protocols* an article describing the assay he and Goodloe developed to assess the presence of metastatic melanoma cells within tumor-draining lymph nodes. Dr. Hargadon was also invited to contribute a review article on anti-tumor T cell dysfunction to the journal *Lymphatics*, and his article, entitled "CD8+ T Cell Dysfunction in Tumor-draining Lymph Nodes: A Hallmark of Tumor Immune Escape that May Arise Early During the Course of Cancer Progression," was published in early 2026.

In addition to the projects he brought to completion last year, Dr. Hargadon has continued to investigate the role of the FOXC2 transcription factor in melanoma progression with current H-SC students. In the summer of 2025, he worked alongside **Baylor Jenkins '26** to: 1) engineer a FOXC2-deficient melanoma cell line using CRISPR-del gene editing technology; and 2) investigate how a pharmacologic FOXC2 inhibitor influences melanoma cell susceptibility to reactive oxygen species-inducing chemotherapeutics. This work was presented by Baylor at both the 2025 Commonwealth of Virginia Cancer Research Conference and the 2026 Network for Undergraduate Research in Virginia's "Posters at the Capitol" Event with the Virginia General Assembly. Dr. Hargadon also worked during the 2025-2026 academic year with **Dillon McReynolds '26** on an RNA-sequencing project designed to assess how the MC-1-F2 FOXC2 inhibitor impacts the melanoma transcriptome, and Dillon will be presenting outcomes of this work at the National Council for Undergraduate Research meeting in April 2026. Dr. Hargadon will continue his work on FOXC2 this summer, with **Jackson Ray '28** and **Adam Cochran '28** both

joining the lab to develop and characterize genetically engineered melanoma models for the study of this oncogenic transcription factor.

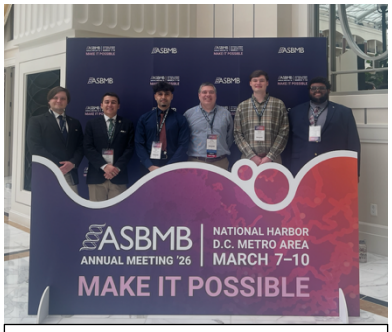
Outside of his efforts in the lab, Dr. Hargadon has continued to serve on the Editorial Board of Springer Nature's peer-reviewed journals *Discover Immunity* and *Discover Oncology*, and he also joined the Editorial Board of *BMC Cancer*, another peer-reviewed journal published by Springer Nature. Additionally, having served as Editor in 2021 for the 1st edition of *Melanoma: Methods and Protocols*, Dr. Hargadon has also been hard at work this year as Editor of a new 2nd Edition of this volume for Springer Nature's *Methods in Molecular Biology* book series. The volume has an anticipated publication date of late 2026/early 2027.

Lastly, for the second year in a row, Dr. Hargadon was named to the Stanford-Elsevier Top 2% Scientists List in the subfield of Immunology. Developed jointly by Stanford University and academic publisher Elsevier, "the annual list identifies the world's most influential scientists as ranked using data from Scopus, one of the largest databases for peer-reviewed research." As highlighted by the Stanford-Elsevier publication, "the ranking is based on a composite score that takes into account how often a scholars' work is cited and the significance of their work, focusing on real impact and not just productivity."

This year **Dr. Alex Werth** is supervising the senior honors capstone project of **Brandon Finch '26** on interspecific competition between native brook trout and invasive brown and rainbow trout, and also serving on the thesis committee of **Marc Moroz '26** on entity realism versus antirealism in science (as studied by laser interferometry evidence of black holes). He will supervise the summer research project by **Will Robinson** on the effects of elevated water and body temperature on recovery time of captured red drum and speckled trout. Dr. Werth has also devoted much time this year to working with the Hampden-Sydney Admission Office in his new role as academic division coordinator, recruiting students to all STEM majors, including Psychology, which he worked to move from the Social Sciences division to Natural Science & Mathematics.

Dr. Werth recently published a paper in the open access PeerJ journal (with three paleontologists from George Mason University) on the independent evolution of convergent skull shapes in several toothed whale and dolphin lineages, and a chapter on analyses of baleen whale filtration to create better human-engineered filters (with physics, engineering, and hydrology colleagues from Saint Louis University) in a book on Biomimetics. He is writing a chapter on whale feeding, with biologists from Stanford and Old Dominion University, for a different book on current studies of marine mammals. He is editing special issues of marine mammal biology for the Oceans and Academia Biology journals, and edited and contributed to most recent Feature Papers of Oceans special issue. Dr. Werth is collaborating on four upcoming papers to be delivered at the biennial conference on marine mammal science in Puerto Rico in October, 2026. One involves analysis of how fishing gear entanglement affects baleen feeding filtration in highly endangered North Atlantic right whales (and other baleen whale species); this follows summer work done with **Brandon Finch '26**, and will also be presented at the North Atlantic Right Whale Consortium this fall. A second conference paper will be presented by Dr. Werth with former student **Shemar Blakeney '18** on the effects of oil on baleen strength and function; the other two papers involve collaboration with colleagues from Bermuda and Turks and Caicos on humpback whale birthing behavior, and collaboration with New Zealand scientists on the dentition of the spade-toothed beaked whale. In addition to supervising Will Robinson's research this summer, Werth will also conduct more work on pygmy right whale and spade-toothed beaked whale anatomy, and on how entanglement affects whale feeding, plus travel to Alaska to be filmed for a European documentary series on whales.

Dr. Michael Wolyniak was honored to become a Fellow of the American Society for Biochemistry and Molecular Biology (ASBMB) this past year. Wolyniak was one of 16 members chosen nationwide from ASBMB's 13,000+ membership roster for his service to the society, which includes coordinating outreach activities for the ASBMB Science Outreach and Communication Committee, serving as the advisor to Hampden-Sydney's ASBMB Student Chapter, and reviewing applications for ASBMB accreditation. Wolyniak was inducted as a Fellow at the 2026 DiscoverBMB meeting at National Harbor outside of Washington, DC, also attended by **Marc Moroz '26, Robert Frazier '26, Matthew Miscikowski '26, Kamaludin Iqbal '27,** and **Joshua Ferreira '27.** Wolyniak also continues his work as a Fellow in the Partnership for Undergraduate Life Science Education (PULSE) Network, where this past year he led an effort to produce a special issue of the journal *Transformative Dialogues* dedicated to PULSE's activities. Finally,



The H-SC delegation at the ASBMB Annual Meeting at National Harbor, MD

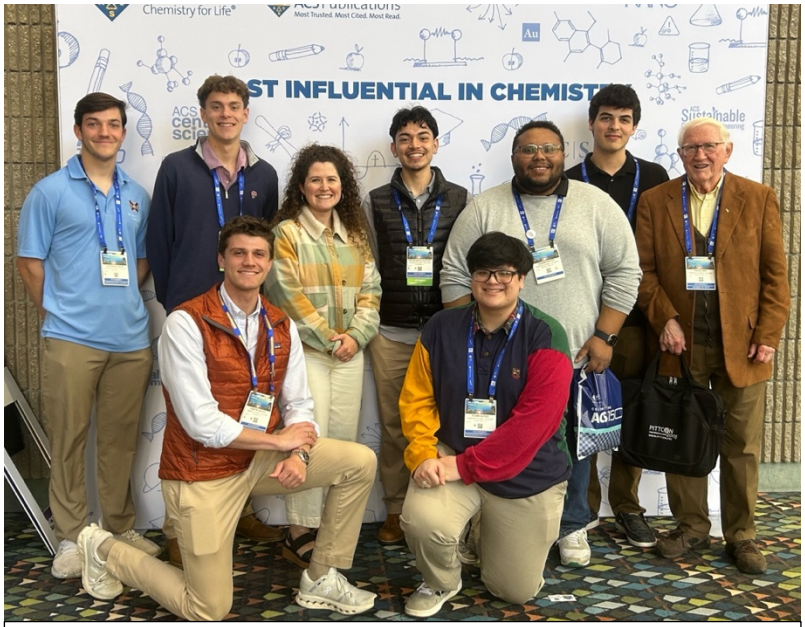
Wolyniak is working with collaborators Dr. Rebecca Roberts of Ursinus College and Bonnie Hall of California Polytechnic State University-San Luis Obispo as Guest Editors on a special issue of *Biochemistry and Molecular Biology Education* focused on reform efforts in undergraduate life science education around the world.

Wolyniak continues research on phosphomimics in malate dehydrogenase, a project designed to better understand how this protein is activated and deactivated in response to environmental change. This project is a part of the nationwide Malate Dehydrogenase CUREs Community (MCC), in which undergraduates from different institutions collaborate on protein biochemistry research. Marc Moroz ’26, Robert Frazier ’26, and Kamaludin Iqbal ’27 have worked with Wolyniak on this project over the past year, and **Zeke Barron ’27** will engage in this work at The University of San Diego with collaborator Dr. Joseph Provost in the summer of 2026.

When not putting out various fires throughout the department and campus, **Jennie Jenkins** facilitated the setup and testing of the new monitoring system on the -80C to provide better protection for sensitive teaching and research samples. Jennie is the glue that holds the department together by supplying needs, wants, wishes, and dreams for researchers, faculty and student alike. Spare moments are spent maintaining or attempting to fix the multitude of things that break each week, keeping everyone safe, and putting out fires before they get out of hand and prevent researchers from researching.

Chemistry – by Ava R. Kreider-Mueller

It’s been a busy year for the H-SC Chemistry Department! A successful search for a new Assistant Professor of Analytical Chemistry was conducted in the Fall of 2025 and **Dr. Sarah Sühnholz** will be joining the H-SC faculty next fall. The Department installed a new autosampler for the GCMS this year. This will allow students to run GCMS on liquids, gases, and even aqueous solutions, expanding the range of samples that may be studied using this important technique. The department also purchased a discrete analyzer which will be installed during the summer of 2026. This automated instrument will be used in both the “Chemistry of the Environment” (CHEM108) course as well as the Advanced Laboratory sequence, to measure chemical parameters in soil and water samples.



The H-SC Chemistry Dept. takes on Atlanta at the 2026 ACS Spring Conference. ***(Back, left to right)*** *Jackson Cofer ‘27, Colin Mason ’28, Dr. Kreider-Mueller, Kevin Nova Euceda ‘28, Dr. Gilyot, Jonathan DeLuna ’28, Dr. Sipe.* ***(Front, left to right)*** *Austin Apesa ’27 and Adam Dayag ’26*

Dr. Gilyot, Dr. Kreider-Mueller and Dr. Sipe accompanied six H-SC students, **Austin Apesa ’27**, **Jackson Cofer ’27**, **Adam Dayag ’26, Jonathan Deluna ’28**, **Colin Mason ’28**, and **Kevin Nova Euceda ’28**, to the 2026 American Chemical Society (ACS) National Meeting in Atlanta, GA in March 2026.

During the summer of 2025 **Dr. Herb Sipe** was fortunate to supervise Colin Mason’s summer research on a project that resulted in three poster presentations: one at the H-SC summer research symposium, another at MARCUS at Randolph College, and again at the spring ACS meeting in Atlanta. Colin studied “Phenoxy Radicals of Curcumin and Related Molecules by Electron Spin Resonance Spectroscopy.” Curcumin is a bioactive, anti-inflammatory, and antioxidant compound found in turmeric, and is often touted as a supplement. Since the radicals are unstable, he had to generate them by the fast flow technique that is now well-developed and frequently employed in our

labs. In addition to mastering the ESR instrument, he used Gaussian DFT molecular orbital calculations to rationalize radical coupling constants. Additionally, Dr. Sipe traveled twice to his alma mater, Juniata College, in Huntingdon, PA to participate in their chemistry department's 100th anniversary observations. Dr. Sipe is also helping Juniata College establish a chemistry instrument endowment similar to the one at H-SC.

Dr. Sipe had the opportunity to deliver greetings as Faculty Marshal on behalf of the College faculty at the November 10 ceremony celebrating the 250th anniversary of the start of classes in 1775. He would like to remind everyone that he was not present when Juniata started having chemistry, nor was he present when Hampden-Sydney started having classes! It is with a mixture of optimism and apprehension that he looks forward to retirement at the end of this year. Dr. Sipe feels that Hampden-Sydney has been a wonderful place to live and teach, and his colleagues have been intellectually stimulating, and his students have been first rate!

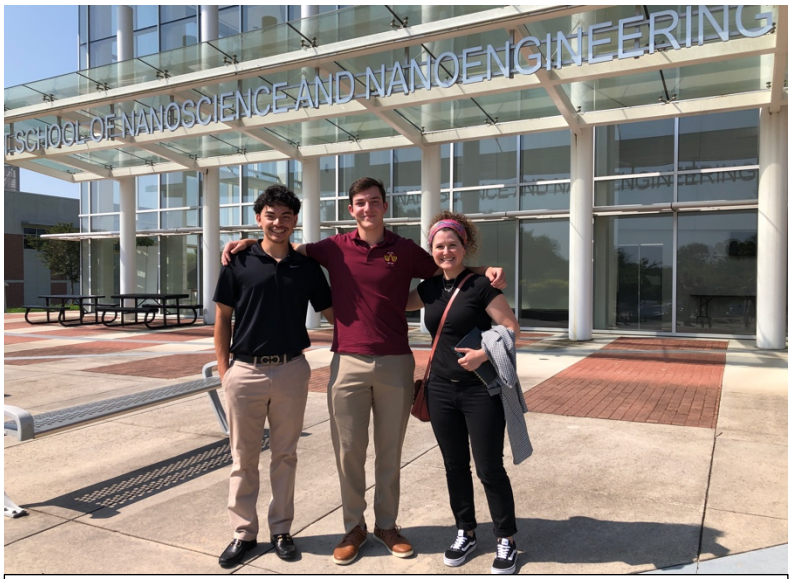
Dr. Kevin Dunn has revived a project from earlier in his career—the attempted synthesis of borazocine, $B_4N_4H_8$. This molecule is isoelectronic to cycloocatetraene, and as such, would be expected to be antiaromatic, with a non-planar structure. Molecular orbital calculations, however, predict a planar structure. The attempted synthesis of this molecule will be the focus of Austin Apesa's Honors project next year.

Dr. Timothy Reichart represented Hampden-Sydney College in several international contexts in the past year. He won a fellowship to be a visiting professor at the Center for Molecular Biosciences at the French National Centre for Scientific Research in Orléans, France, where he spent a month conducting research and establishing a new collaboration with researchers there. In October he also presented his research on the chemical synthesis of proteins using protein self-assembly in a talk given at the 16th Australian Peptide Conference in Launceston, Tasmania.

Dr. Reichart has also continued the development of his course, "Introduction to the Chemistry of Food" (CHEM 130). Having previously taught this course twice as an elective popular with juniors and seniors, this year Dr. Reichart offered it as an Honors course primarily for freshmen.

Dr. Reichart continues to be involved throughout campus, and this year began serving as the chair of the Academic Strategic Plan Committee. That committee is soliciting proposals for improvements and new curricular and co-curricular initiatives at the college. In recognition of Dr. Reichart's success and service, he was recently inducted into the Lambda Circle of Omicron Delta Kappa. Perhaps most importantly, the Promotion and Tenure Committee recommended that Dr. Reichart be granted tenure and promotion to associate professor. Congratulations Dr. Reichart!

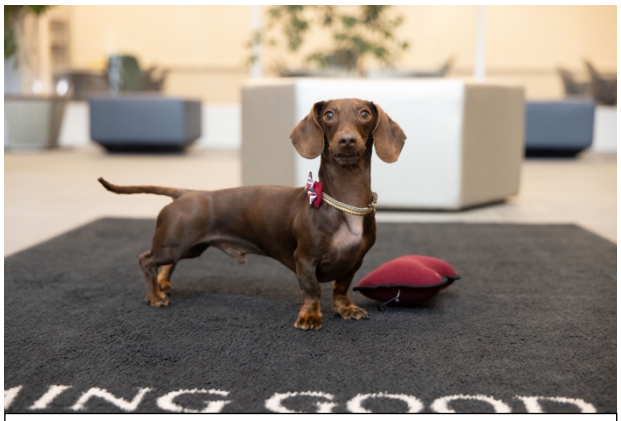
Dr. Ava Kreider-Mueller had the pleasure of conducting summer research with Kevin Nova Euceda '28 and Jackson Cofer '27 during the Summer of 2025. These students both contributed to a research project entitled "Coordination Chemistry of Main Group Metal Complexes with N-Heterocyclic Chalcogenones". This is a project that was created as part of a collaboration with Dr. Dan Rabinovich of the Joint School of Nanoscience and Nanoengineering (JSNN) in Greensboro, NC. In June of 2025 Dr. Kreider-Mueller, Kevin, and Jackson all traveled to JSNN to meet with Dr. Rabinovich's research group and tour the institution's impressive facilities. Kevin and Jackson presented the results of their research at the ACS Spring Meeting during the *Undergraduate Research at the Frontiers of Inorganic Chemistry* poster session.



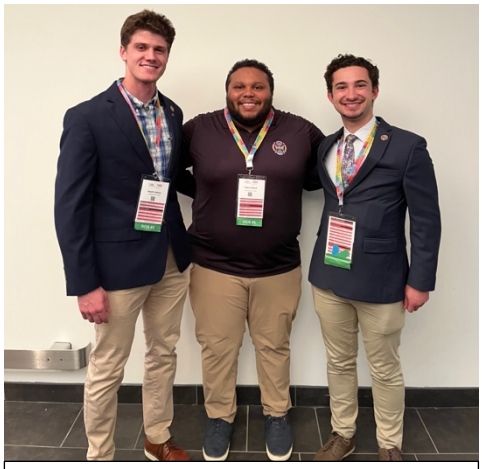
***(Left to Right)** Kevin Nova Euceda '28, Jackson Cofer '27, and Dr. Kreider-Mueller at JSNN*

Last Summer Dr. Kreider-Mueller was selected to attend a 1-week intensive X-ray crystallography course that was offered by the American Crystallographic Association at Northwestern University. As part of the course Dr. Kreider-Mueller collected data on three crystal samples and published one crystal structure in the Cambridge Structural Database as a *CSD Communication*.

Beyond academics, a highlight of her year was dressing up as a colorful, friendly witch and performing chemistry demonstrations at the H-SC Halloween Trunk-or-Treat Event! She was also delighted when her little dachshund, Edison, was chosen to be “Mr. April” in the H-SC 2026 Pet Calendar!



Edison the dachshund, aka “Mr. April”



(Left to Right) *Austin Apesa ‘27, Dr. Gilyot, and Davis Mills ‘27 at the 2025 National Organic Symposium at Rensselaer Polytechnic Institute in Troy, NY.*

Dr. Glenn Gilyot has been busy over the last year working with several students on research projects. During summer 2025, he worked with **Austin Apesa ’27** and **Davis Mills ’27** on projects that aimed to create small molecule fluorescent probes for detection and tracking of neuropeptides: galanin and leptin. Also, Dr. Gilyot worked on a project to reconfigure the intermediate lab project for first semester organic chemistry students. The goal of this project was to incorporate more synthetic experience into the intermediate lab to help them become comfortable with synthetic techniques. In addition to that, Dr. Gilyot, Austin, and Davis attended and presented at the 2025 National Organic Symposium at Rensselaer Polytechnic Institute in Troy, NY.

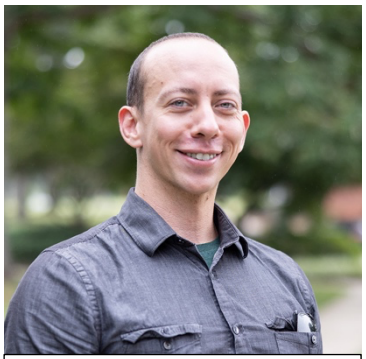
During the academic year, Dr. Gilyot worked with **Jonathan Deluna ’28** to continue a project synthesizing a small molecule fluorogenic probe for detection of liver cancer. They were able to successfully fix and scale up previous reactions using the microwave chemical reactor. The microwave reactor was also a key figure in the new intermediate lab project that was unveiled in the Fall 2025 semester.

Austin and Jonathan presented posters covering their research projects in the Gilyot lab at the undergraduate poster session. Dr. Gilyot loves taking students to the ACS meetings to show them the research and career paths available to chemistry and chemistry-related majors.

Mathematics and Computer Science – by Brian C. Lins

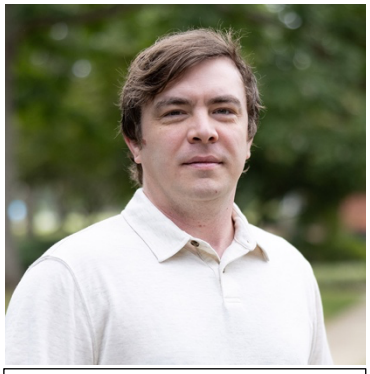
The Department of Mathematics and Computer Science welcomed two new faculty members in 2025. **Dr. Joseph Rennie** joins the Department after earning his Ph.D. at the University of Illinois at Urbana-Champaign, while **Dr. William Tolley** joins the Department following graduate study at Arizona State University.

This past year, **Dr. Brian Lins** published a paper “Real Analytic Nonexpansive Maps on Polyhedral Normed Spaces” in the Proceedings of the AMS. Along with co-author Dr. Aljoša Peperko at the University of Ljubljana, he also submitted a paper “The Berger-Wang formula for order-preserving homogeneous maps on cones” for peer review. Along with Dr. William Tolley, Dr. Lins has also served as the faculty advisor for senior Seth Spickard who is completing an honors thesis, “TigerWeb2: a critique of



Dr. Joseph Rennie joined the Mathematics and Computer Science Department in 2025

TigerWeb and the development of its replacement".



Dr. William Tolley joined the Mathematics and Computer Science Department in 2025

Dr. Sarah Loeb published a paper, "Reconstruction of Caterpillar Tanglegrams" (with A. Clifton, E. Czabarka, K. Liu, U. Okur, L. Szekely, and K. Wicke) in Discrete Applied Mathematics. During her Fall 2025 sabbatical, she continued her work on tanglegrams and gave seven external seminar talks.

Dr. Michael Strayer has a paper currently under peer review titled "Standard posets and integral weight bases for symmetric powers of minuscule representations," which he finished writing and posted on the preprint server arXiv.org last summer. As a result of posting this paper, he started working with Dr. Sam Jeralds at the University of Sydney in Australia on a follow-up paper. Dr. Jeralds has invited him to come to Sydney to work on the paper and to give a talk in their algebra seminar which Dr. Strayer plans to do in June 2026. In addition to these projects, Dr. Strayer has started writing a textbook titled "Combinatorics of Semisimple Lie Theory" during his Spring 2026 sabbatical. He has proposed this book to a publisher and intends to use this book when he teaches Math 385: Special Topics (Lie Algebras and Combinatorics) in the Fall 2026 semester. Finally, with Dr. Sarah Loeb he is co-supervising senior Ansen Lackner in a Senior Honors Capstone project titled "Cycle Graphs and Colored Posets Generating Representations of Kac–Moody Algebras."

Physics and Astronomy – by Hugh O. Thurman III

Dr. Steven Bloom last year had his article "Using EXCEL and VLC Player to Analyze the Takeoff of a Boeing 747-400 Airplane" published in Physics Education. This article considers the forces on an airplane at takeoff and the effects that has on the stretch of runway needed. It is based on exercises used in Physics 331 Mechanics. Similarly, another article he is working on centers on comparisons between analytical and computational solutions for the rocket equation and applied to commonly known rockets of the past and present (Space Shuttle, various Space-X rockets). He is also working with students on observatory research projects related to the search for exoplanets and separately, analyzing the variability of blazars.

Dr. Stanley Cheyne presented two papers at the 189th meeting of the Acoustical Society of America which was also the 6th joint meeting with the Acoustical Society of Japan. The meeting was held in Honolulu, HI in December 2025. The first paper was titled "Reflections of a bubbly liquid: staying dry while measuring the void fraction," co-authored with Drs. R. Glynn Holt and Trey Thurman. The second paper was titled "The design and performance of an ultrasonic acoustic proof hydrometer," co-authored with Phillip Anderson. Drs. Cheyne, Holt, and Thurman also published a paper titled, "Methods of sound speed and attenuation measurements in bubbly liquids," in J. Acoust. Of Amer., POMA 60, Dec. 2025.

Dr. Glynn Holt co-authored US Patent 12,480,926, *Systems, devices, and methods for ultrasonic agitation mediated kinetic release testing of compounds* with M Zaman, AJ Acevedo, and D Desai. The patent, published in November 2025, describes a system for low-cost and portable battery-operated quality testing of compounded drugs in under-developed locations. The novel aspect is the combination of ultrasonic agitation for rapid and repeatable dissolution with a quantitative analysis section into a single portable package. He continues to teach some of his favorite classes, including Fluid Mechanics (PHYS 343), Statics (PHYS 215) and Classical Acoustics (PHYS 385).

Dr. Jonathan Keohane has been on sabbatical this year and has served as a visiting scholar in the Department of Physics and Astronomy at the University of North Carolina at Chapel Hill. He has continued to maintain and automate the Hampden-Sydney Observatory and to support student use of the telescope for research and instruction. His recent work includes a refereed Astronomy Education Journal publication on observing pulsars with the Green Bank 20-meter radio antenna, along with related presentations at the January 2026 American Astronomical Society meeting and an invited workshop at the RTSRE conference in Hobart, Tasmania. He has also continued research in gamma-ray burst afterglow modeling and in radio observations of large supernova remnant candidates.

This year, **Dr. Mike McDermott's** research has centered on a novel application of the Mössbauer Effect: characterizing the hyperfine interactions within iron-doped 3D printer filaments. While his long-term work has focused on the fundamental physics of stimulated emission and nuclear coherence, this current project utilizes

those same high-precision spectroscopic techniques to probe the material properties of functional composites. Working with **Jake Williams '26** as part of his Advanced Project, the lab is investigating how the thermal cycles of additive manufacturing alter the oxidation states and magnetic environments of the filament by analyzing the isomer shift and quadrupole splitting of iron atoms embedded in a polymer matrix. In parallel with this materials research, Dr. McDermott is collaborating with **Luke Glenn 26** on an automation system for the H-SC greenhouse as part of Luke's Honors Research. This project applies engineering to environmental control, utilizing a custom-integrated suite of sensors and actuators to measure temperature and humidity, as well as manage and automate watering. This project provides the framework to expand the system to monitor and control other environmental factors in the greenhouse.

Dr. Trey Thurman has continued his work with Dr. Cheyne and Dr. Holt in trying to measure the phase speed and attenuation of sound in a bubbly liquid. This research project has been active for almost a decade now and most recently has produced some promising results. The most recent results were presented Dr. Cheyne at the Acoustical Society meeting in Hawaii and a publication in the Journal of the Acoustical Society of America POMA. Dr. Thurman worked with **Ahmad Bangura '27** and **Ross Roberts '26** last summer on two separate research projects. Ahmad investigated the hydraulic permeability of soil samples taken here on the campus of Hampden-Sydney College and worked on constructing a prototype of a falling head permeameter which is required for measuring low permeability soils such as those here on the campus. Ross worked on a computational project designed to utilize the image processing capabilities of PASCO Capstone software to make measurements of particle tracks in bubble images. These values were then imported into an Octave program written by Ross to calculate rest mass energies and lifetimes of the particles. This past academic year Dr Thurman worked with **Cooper York '26** on his Honors project that was focused on developing a flywheel-based resistive training apparatus. The project turned into a computational effort to describe observed effects in the lab from a simple physical model of a rotating flywheel system.

***Psychology* –** by Jennifer E. Vitale

In 2025-2026, students and faculty engaged in a variety of academic and scholarly pursuits. **Dr. Rebecca Bauer** published two articles: "Evaluating qualities of pretend play: Classroom observations and teacher perceptions," in *Early Education and Development* and The Creativity in Play Scale: Examining the role of imagination and self-regulation in childhood creativity," in *Psychology of Creativity, Aesthetics, and the Arts.* In addition, her article, "Creativity across domains: Examining the role of imagination and self-regulation in early childhood creativity" was accepted in *Psychology of Creativity, Aesthetics, and the Arts* with co-authors E. Bray and A. Gilpin. This paper examined how imagination, self-regulation, or a combination of these skills were important skills for preschoolers' creativity across domains and informants and included data that was collected by Hampden-Sydney students in Farmville preschools in 2022-2023.

Dr. Matt Locey continued to develop his research program on the quantitative analysis of decision-making, and ended the year with two articles under review focused on the phenomenon of social discounting--how benefits to others matter more to us the closer those others are. He was also invited to the Rhode Island Association for Behavior Analysis this spring where he gave a presentation on "The Death of Parsimony in Behavior Science".

In summer 2025, **Dr. Ivo Gyurovski,** who continues as Assistant Dean for Grants and Faculty Development, co-lead a May Term program to France together with Profs. Thornton (Economics and Business) and Kleinlein (Visual Arts). This interdisciplinary trip provided a unique opportunity for students to apply psychological concepts and theory to their experience and understanding of a new culture.

This year, the Department was proud, once again, to see our students engage meaningfully in scholarship and to present their first-authored work at conferences off the Hill. Through her Developmental Psychology lab, Dr. Bauer and her students collected data and conducted observations from over 35 children at various preschools in Farmville examining creativity, imaginative play, and prosocial behaviors in early childhood. **Luke Lindquist '26**, who spent the summer as a Summer Scholar with the Department of Pediatrics at the Macon and Joan Brock Virginia Health Sciences at Old Dominion University, presented his work, "Qualitative and Large Language Model (LLM) Assessments of Substance Use Practices by Educational Institutions" in a symposium presentation at the annual meeting of the Society for Research on Nicotine and Tobacco in Baltimore, MD. **Lily Bauer '29** presented her research, "Imaginary friend creativity: Exploring interactions between executive functions and imagination using children's role play creativity," at the annual meeting of APA Division 10

Conference on the Psychology of Aesthetics, Creativity, and the Arts (March 2026) in Omaha, NE. Finally, **Jacob Garner ’27** has had his work “Priming Effects of Social Discounting” accepted to the annual meeting for the Association for Behavior Analysis International, in San Francisco this summer.