

Virginia Academy of Science

102nd Annual Meeting May 16, 2024



*University of Mary Washington
Fredericksburg, VA*

The Virginia Academy of Science

The **Virginia Academy of Science** (VAS) is the fifth largest state, region, or city academy of science in the U.S.; it was founded in 1923 to promote the civic, academic, agricultural, industrial, and commercial welfare of the people of Virginia. Exemplary programs have included *Flora of Richmond and Vicinity*, Published, 1930, the first comprehensive multidisciplinary studies of the James River Basin and the Great Dismal Swamp, volunteer research assistance to Virginia in the instance of the Kepone pollution disaster, and leadership in establishing the Science Museum of Virginia.

Annual Meetings:

The Academy enjoys two annual meetings, one in Fall (historically, around the last week in October) and one in Spring (around the last week in May).

Our [Fall Meeting](#) is held as an Undergraduate Research Proposal fair, during which students from Virginia Universities (public and private) participate in a competitive poster session. Exceptional presentations are [awarded grant funding](#) from the Academy to complete their projects. Historically, we have been able to award up to ten \$900 research grants. Students who receive grant funding are expected to present their research at the subsequent Spring meeting of the Academy.

The 2024 Fall Meeting is scheduled for Saturday, November 9 at Ferrum College. *We always appreciate faculty who are willing to serve as judges at our Fall meeting. If you are interested, please contact Parrish Waters (rwaters@umw.edu).*

Our [Spring Meeting](#) is a traditional expose of undergraduate and graduate research. We have enjoyed 100 years of meetings. Students and representatives from over 30 Virginia organizations and Universities regularly participate in this meeting, presenting their research and ideas that span 16 scientific disciplines in oral and poster formats.

The Virginia Junior Academy of Science

[VJAS](#) is a national model for the new and renewing state junior academies and has been ranked among the top three in the nation for over two decades. Through VJAS and other programs, VAS annually reaches over 40,000 Virginia middle and high school students. Hundreds of volunteers make it possible for Virginia secondary students to experience these activities.

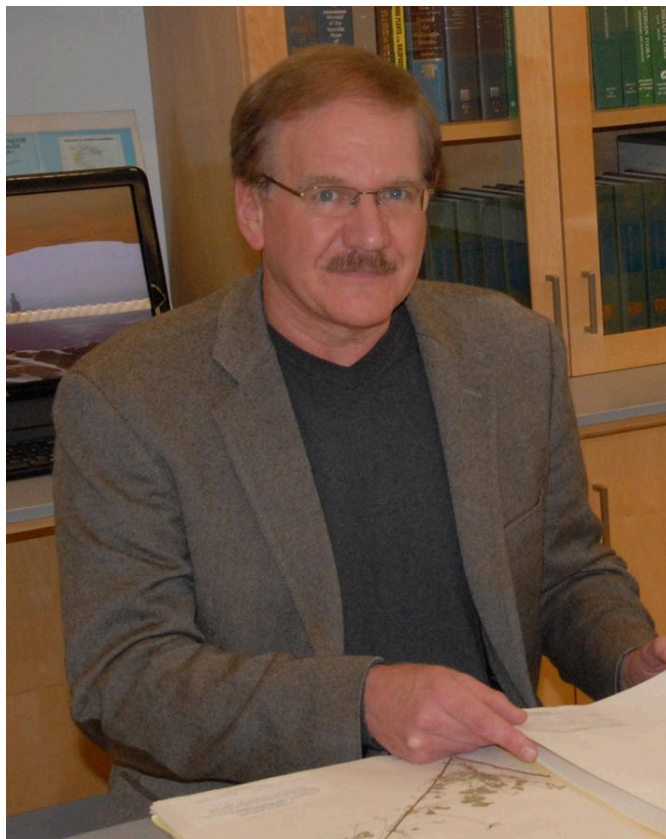
A Tradition of Excellence, A Commitment to Action Join the Virginia Academy of Science Support the Virginia Academy of Science

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2024 Officers of the Virginia Academy of Science



President Conley McMullen,
James Madison University
Harrisonburg, VA

President-Elect.....Parrish Waters. University of Mary Washington, Fredericksburg, VA
Vice-President.....Christopher Osgood. Old Dominion University, Norfolk, VA
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Executive Officer Emeritus..Arthur Conway. Virginia Academy of Science, Richmond, VA
Associate Executive Officer Emeritus....Carolyn Conway. Virginia Academy of Science,
Richmond, VA

Map of Fredericksburg UMW Campus



Parking will be at 6 (Alvey parking deck) or beside 12

People staying at the Hyatt can simply keep their car there and walk across the pedestrian bridge.

Handicapped parking is available at 6, 4 and next to Jepson Science Center (9)

Jepson Science Center (9)-all oral presentations and section business meetings

Hurley Convergence center (13) - all poster presentations and registration/check-in, Fellows Meeting and Council Meeting on Friday May 17

Lunch, 4th floor of the Cedric Rucker University Center (Building 25 on map-there is handicapped parking in the lot at the UC on college Ave or in GW lot- building 40)

Scholarship Awards/Negus Lecture/Installation of VAS Officers - Dodd Auditorium located in George Washington Hall (Building 40)

VAS President's Welcome

May 2024

Welcome to the 101st Annual Meeting of the Virginia Academy of Science (VAS), which is being held this year in Fredericksburg, Virginia, at the University of Mary Washington.

On April 26, 1923, University of Virginia biologist Ivey F. Lewis convened the first meeting of the Virginia Academy of Science at the College of William and Mary. Since then, the Academy has supported scientific research, sought to improve science education, and encouraged fellowship among scientists, graduate students, undergraduate students, and citizen scientists throughout the state. An official affiliate of the American Association for the Advancement of Science since 1926, the VAS has been at the forefront of science, scientific research and science education in Virginia for nearly a century.

Our mutual interests draw Academy members from throughout Virginia and beyond. If you are not currently a member of the Virginia Academy of Science, please consider joining. Membership is open to any individual with an interest in scientific research and science education. We have special rates for students. Each spring, we gather at our Annual Meeting to share findings, compare experiences, and renew friendships.

While you are enjoying this year's meeting, please take time to learn more about the VAS and consider joining our group of volunteers. We have an open door to all those who wish to serve, and the possibilities are diverse. Contact President-elect Parrish Waters or speak with another Academy officer if you are interested.

Meanwhile, I hope that you will enjoy all of our presentations, invited speakers, and social events. The Annual Meeting is a great time to form networks, make friends, encourage our young K-12 scientists and their teacher sponsors, and discover new opportunities in research, education, and service in the name of science and science education.

Thanks so much for making our Annual Meeting a success!

Sincerely,
Conley K. McMullen, Ph.D, FLS
Professor of Biology
James Madison University

UMW President's Welcome

Dear Members of the Virginia Academy of Science,

We are thrilled to welcome you to our beautiful campus for your annual meeting! The University of Mary Washington (UMW) is fundamentally built as a public liberal arts and sciences university with the sciences at the core of its academic and co-curricular offerings. From biology to chemistry, physics and Earth and environmental sciences, to computer science, geography and math, we offer students a plethora of learning opportunities through research grants, scholarships, study abroad, internships and more.

Many of these projects and experiences are led by our esteemed faculty, who in addition to their love of teaching are thoughtful scholars and experts in their fields. UMW faculty offer unrivaled expertise in our academic programs and are at the forefront of our program successes, working alongside students, encouraging them to excel in and out of the classroom - everything from winning national symposium awards and Fulbright scholarships, receiving national recognition for their remarkable research projects, gaining enrollment into prestigious graduate programs, to earning top notch professional employment positions at companies on the cusp of making critical discoveries in scientific fields.

Our alumni exemplify these outcomes and generously support ongoing scientific research. Last spring, UMW received a [\\$30 million gift](#) - the largest in the institution's 115-year history - from the estate of Irene Piscopo Rodgers '59, to fund scholars in science, technology, engineering, and math through scholarships and undergraduate research. A pioneer in the field of electron microscopy, Rodgers saw many ways to help our students, from funding Alvey Scholarships that provide full tuition, fees and room and board for out of state students, to outfitting our labs with the latest technology. She has helped pave the way for UMW graduates, especially women, to excel in STEM subjects of their choosing, and with this transformative gift, UMW is able to offer the most funding for undergraduate students in these fields than any other institution of our size.

With additional funding for internships and apprenticeships, as well as a National Science Foundation grant to implement the Noyce Scholarship for aspiring teachers, UMW excels in our approach to science education. We encourage you to explore the opportunities in our classrooms and labs and in partnership with our faculty experts and student scholars, whether that's during the conference, in one of our Innovation Challenges at the Dahlgren Campus, or in a return visit.

On behalf of UMW faculty, staff and students, we hope you have a productive and exceptional visit. We welcome you to enjoy our campus and wonderful community.

Sincerely,

Troy D. Paino, J.D., Ph.D.

President



About the University of Mary Washington

At the heart of historic Fredericksburg, the [University of Mary Washington \(UMW\)](#) is an absolutely friendly, be yourself, public liberal arts and sciences university filled with dynamic, smart, compassionate people, and lots of bricks and trees.

With more than 234 acres, the University of Mary Washington campus boasts state-of-the-art science labs where undergraduate research takes shape, a business program where entrepreneurs start-up their vision, and a recently renovated home base for the College of Education with model classrooms and makerspaces that inspire teachers and students. The future of UMW includes the construction of a breathtaking theatre that will house our theatre program, which regularly produces grads who make it to Broadway, and art and music studios that thrive with performances and exhibits.

Founded in 1908 as a state teachers' college, the University of Mary Washington continues to define teacher excellence with expertise in undergraduate education and select master's degrees, in Colleges of Arts and Sciences, Business, and Education. Students are serious about academics, dedicated to an inclusive community, and eager to contribute to the greater good. [UMW focuses on what matters](#) and encourages individuals to create meaningful connections and powerful experiences.

With over [90+ majors, minors, and programs](#), and conveniently located between Washington, D.C. and Richmond, VA, UMW is committed to connecting students to the experiences that will take them to the next level – this includes internships, [study abroad](#), over 150 student organizations and clubs, [NCAA Division III Athletics](#), research projects, community service, and job opportunities. Deep thinking and doing happens daily at UMW, and students go for collaboration over competition. Students work with professors who double as mentors as UMW has a 13 to 1 student to faculty ratio. Campuses in Stafford and Dahlgren extend UMW's reach into the community through professional development and specialized programs.

While many schools are defined by what they are, UMW also defines itself by what it is not. Instead of a football team, there's numerous club sports, team sports and intramurals, and 18 NCAA DIII sports. There's no Greek life, but newly renovated residence halls and apartment buildings teem with community and social events, and academic honor societies thrive, launching lifelong friendships. There are no teaching assistants – zero. More than 95% of UMW's courses are taught by faculty with terminal degrees in their field, and the remainder benefit from career professionals with a lifetime of work experience, often within the corridors of power and influence in Washington, D.C., and beyond. Students and alumni become Fulbrights, Goldwater Scholars, and lead the nation in public service as UMW has one of the highest percentages of students who go on to the Peace Corps of any school of its size in the country.

Whether exploring the University for the first time or returning, UMW invites you to visit campus and experience it for yourself online at [umw.edu](#) or in-person. Welcome to UMW!

Sydney S. Negus Memorial Lecture VAS Academy Conference



Title: Bridging Science & Policy: The Story of Stormwater Bioretention in Virginia

Bio:

John Tippet has spent the last 35 years working across the government, consulting, and nonprofit sectors in the field of watershed management. Currently an adjunct faculty member at the University of Mary Washington, his research focuses on the design of “Low Impact Development” practices to protect water quality on developed sites. He is also currently leading a study on the biodegradation of PHA plastics in different freshwater and marine environments.

Professor Tippet served for 20 years as Executive Director of Friends of the Rappahannock, where he led successful initiatives to preserve riparian land, restore anadromous fish passage, and reform stormwater pollution regulations. Prior to his NGO work, he was an environmental scientist with Research Triangle Institute where he developed watershed nutrient loading models. He has worked internationally for USAID, which included the development of pollution management software for the Danube Basin and the training of NGO watershed organizations in the Philippines. He holds a Master’s degree in Environmental Resource Management from Duke University.

VAS Spring 2024 Conference Overview

Thursday, May 16

- 8:00-8:30 am Coffee and Light Pastries
Hurley Convergence Center
- 8:00-10:00 am Check-in and Late registration
Hurley Convergence Center
- 8:00-9:00 am VAS Poster Check-in and setup
Hurley Convergence Center, Rm. 136 Digital Auditorium
- 8:30-12:00 pm **Oral Presentations by academic sections and section business meetings**
- Astronomy, Math & Physics**
meeting in Jepson Science Center 451
- Biology-Microbiology & Molecular Biology/Medical Sciences**
meeting in Jepson Science Center 100
- Biomedical and General Engineering**
meeting in Jepson Science Center 458
- Botany**
meeting in Jepson Science Center 109
- Chemistry**
meeting in Jepson Science Center 225
- Data Science, Computing, and Statistics**
meeting in Jepson Science Center 454
- Environmental and Conservation Science /Entomology**
meeting in Jepson Science Center 229
- Psychology**
meeting in Jepson Science Center 219
- Structural Biology, Biochemistry and Biophysics/Materials Science**
meeting in Jepson Science Center 217B
- 12:00-1:15 pm Lunch, 4th floor of the Cedric Rucker University Center (Building 25 on map-there is handicapped parking in the lot at the UC on college Ave or in GW lot- building 40)
- 1:30-2:45 pm Scholarship Awards/Negus Lecture/Installation of VAS Officers
Dodd Auditorium located in George Washington Hall (Building 40)
- 3:00-3:30 pm Fellows meeting, *Hurley Convergence Center 111*
- 3:00-5:00 pm **Poster Sessions-** Authors will be present to discuss posters and answer questions
Hurley Convergence Center, Room 136 Digital Auditorium

Friday, May 17

- 9:00-11:00 am VAS Council Breakfast and Meeting, *Hurley Convergence Center 136*

ASTRONOMY, MATH & PHYSICS

Section Officers

Chair: Craig Group, University of Virginia, Physics

Vice Chair: Charles R. Crook, Retired

Secretary: Joseph D. Rudmin, James Madison University, Dept. of Integrated Sciences & Technology

Editor: Marco Aldi, Virginia Commonwealth University, Dept. of Physics

Councilor: Craig Group, University of Virginia, Dept. of Physics



Invited speaker Desmond Villalba is an assistant professor at the University of Mary Washington (UMW) who started in the fall of 2021. He completed his PhD from the University of Alabama back in 2019 where he studied high energy physics and phenomenology. Since being a professor at UMW, he has continued pursuing questions behind dark matter, extra-dimensions, and the phenomenological implications of these compared to experiment and astronomical observations.

ORAL PRESENTATIONS

Thursday, May 16, 2024

Jepson Science Center

Room 451

9:00 [1] **Some Results on Optimizing Evenness of Sets of Vertices**

Christopher T. Leffler, Virginia Commonwealth University

Neal O. Bushaw, Virginia Commonwealth University

Brent M. Cody, Virginia Commonwealth University

9:15 [2] **Exploring a Possible Quantum Mechanical Connection Between the Finite Fields and Octonion.**

Hampton T. Smith, Virginia Tech

Tatsu Takeuchi, Virginia Tech

9:30 [3] **∞ -cohomology of completely prunable hypergraphs**

Samuel Bevins, Virginia Commonwealth University

Marco Aldi, Virginia Commonwealth University

9:45 [4] **Search for Highly Ionizing, Massive Particles at the NOvA Far Detector**

Dayne Coveyou, University of Virginia

10:00 [5] **LDMX: The Light Dark Matter Experiment**

Kieran Wall, University of Virginia

10:15 [6] **A background filter for the dark matter search in the visible channel at LDMX**

Anmol Sandhu, University of Virginia

10:30 [7] **Learning Spin Ice Manifold with Boltzmann Machines**

Jackson C. Glass, University of Virginia

- 11:00 [Invited Speaker] **Looking Beyond the Veil of Four Dimensions**
Desmond Villalba, University of Mary Washington
- 2:30 [8] **Supersymmetric and non-supersymmetric quantum mechanics**
Marco Aldi, Virginia Commonwealth University
- 2:45 [9] **PSM for Partial Differential Equations.**
Joseph D. Rudmin, James Madison University
- 3:00 [10] **3D printed electronics with nanomaterials**
Daeha Joung, Virginia Commonwealth University

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

- Poster 01 **Photoionization of Carbon Dioxide in the Molecular Frame**
Carolyn Healy, University of Mary Washington
Varun Makhija, University of Mary Washington
- Poster 02 **Rotational dynamics of nitromethane using the random phase quantum state model**
Katherine Lauderbaugh, University of Mary Washington
Hugo Andres Lopez Pena, Virginia Commonwealth University
Mi'Kayla Word, Virginia Commonwealth University
Katharine Tibbetts, Virginia Commonwealth University
Varun Makhija, Virginia Commonwealth University
- Poster 03 **Investigation and Limited Experimental Validation of a New Model for Characterizing Aircraft Lift Generated Wake Vortices**
Jake Rough, Randolph-Macon College
- Poster 04 **Categorizing 2-adjacent knots**
John Carney, Virginia Commonwealth University
- Poster 05 **Testing unidentified gamma-ray sources for spatial extension in the search for particle dark matter**
Maria A. Carrillo, Virginia Tech
- Poster 06 **Optical characterization of thin film through Ellipsometry**
Po Huang, University of Richmond
- Poster 07 **Evaluating and designing metasurfaces for exciting skyrmions in two-dimensional materials**
Sophia R. Ellis, University of Richmond
- Poster 08 **Silicon Photomultiplier Temperature Dependency**
Anran Zhao, University of Virginia
- Poster 09 **Investigating Population Dynamics on a Three Species Model**
Julianna Kelley, Virginia Tech, HHMI Institute
Tatsu Takeuchi, Virginia Tech, HHMI Institute
- Poster 10 **First principles simulation of color-center defects in lithium fluoride for sensing low-energy nuclear recoils**
Mariano Guerrero Perez, Virginia Tech
Vsevolod Ivanov, Virginia Tech
Tatsu Takeuchi, Virginia Tech

Poster 11 **Tunable Transport In Topological Metal Mn₂Au For Spintronics Applications**

Arushi Deb, Virginia Tech
Vsevolod Ivanov, Virginia Tech
Tatsu Takeuchi, Virginia Tech

Poster 12 **Testing unidentified gamma-ray sources for spatial extension in the search for particle dark matter**

Maria A. Carrillo, Virginia Tech
Tatsu Takeuchi, Virginia Tech

Poster 13 ***Ab initio* properties of color center defects for mineral detection of dark matter**

Pranshu Bhaumik, Virginia Tech
Vsevolod Ivanov, Virginia Tech
Tatsu Takeuchi, Virginia Tech

BIOLOGY- MICROBIOLOGY & MOLECULAR BIOLOGY and MEDICAL SCIENCE

Section Officers Biology

Chair: R. Parrish Waters, University of Mary Washington, Dept. of Biological Sciences

Vice Chair: April Wynn, University of Mary Washington, Dept. of Biological Sciences

Secretary: Deborah O'Dell, University of Mary Washington, Dept. of Biological Sciences

Editor: Vacant

Councilor: Michael S. Price, Liberty University, College of Osteopathic Medicine

Section Officers Medical Science

Chair: Balaji Nagarajan, Virginia Commonwealth University, Dept. of Medicinal Chemistry

Vice Chair: Connor O'Hara, VA Commonwealth University, Dept. of Medicinal Chemistry

Secretary: Ram Gunta, Virginia Commonwealth University, Dept. of Medicinal Chemistry

Editor: Vacant



Invited speaker Dr. Sarah Catherine "Kitty" Hartvigsen is a Trawick Postdoctoral Scholar in Dr. Kelly Lambert's lab at the University of Richmond where her research examines how positive experiences influence the neurobiology of emotional circuits and behavior. She teaches *Neurobiology of Movement and Exercise* and *Clinical Neuroscience* courses in the Psychology Department at University of Richmond. Dr. Hartvigsen earned a B.S. in Neuroscience and German Studies from Furman University and was a Fulbright Student Grant recipient to Germany. She holds a PhD in Exercise Science from the University of South Carolina where her doctoral work focused on how acetylcholine, a neurotransmitter influenced by exercise and stress, regulates the emotional circuit of the brain. Prior to pursuing postdoctoral work at the University of Richmond, she received postdoctoral training at the University of South Carolina School of Medicine where her research focused on mechanisms underlying individual differences in fear learning and extinction in a rodent model of PTSD. Dedicated to increasing neuroscience research, education and outreach opportunities for students, Dr. Hartvigsen has been involved with and led multiple neuroscience outreach initiatives at the local, state, national, and international levels and currently serves as the co-chair of the Faculty for Undergraduate Neuroscience's Public Policy Committee.

ORAL PRESENTATIONS

Thursday, May 16, 2024

9:00 [1] **An inquiry into the validity of the Tube Test as a measure of dominance in mice.**

Tim Philbeck, University of Mary Washington
Parrish Waters, University of Mary Washington

9:15 [2] **Assessing acetylation outcomes of putative proteins in *Cryptococcus neoformans***

Felice B. Kho, Liberty University
Ethan Carlile, Liberty University
Timothy N. James, Liberty University
Dr. Gary D. Isaacs, Liberty University

9:30 [3] **Characterizing the *Mcoln1*^{-/-} mouse as an early AMD model**

Jonathan G. Miller, James Madison University

9:45 [4] **Nucleotide Utilization of *Clostridioides difficile* during the Stringent Response**

Brandon M. Card, Old Dominion University

- 10:00 [5] **Structural prediction of *Bacillus* phage proteins using alpha fold**
Stephen Zdziebloski, University of Mary Washington
Swati Agrawal, University of Mary Washington
- 10:15 [6] **Influence of SCP1 on *Cryptococcus neoformans* Virulence**
Carleigh J. Warsing, Liberty University
- 10:30 [7] ***Withdrawn***
- 10:45 [8] **Development and evaluation of method for complete collagenase I digestion of *Bos taurus* bone samples**
Reilly Price, Virginia Commonwealth University
Ciara Rhodes, Virginia Commonwealth University
Sarah Seashols-Williams, Virginia Commonwealth University
- 11:00 [9] **Examining the Therapeutic Efficacy of Chemotherapy in Combination with Methionine Restriction in Breast Cancer**
Abigail E. Glenn, University of Mary Washington
Laura Sipe, University of Mary Washington
- 11:15 [Invited Speaker] **Neurobiological and behavioral differences in a rodent model of enhanced anticipation of appetitive events.**
Sarah Hartvigsen
- 2:30 [10] **Fighting antibiotic resistant in pathogenic *Bacillus* species with Phage therapy**
Michael combs, University of Mary Washington
Swati Agrawal, University of Mary Washington
- 2:45 [11] **Reduction of wastewater nitrous oxide to ammonia through microbial electrolytic cells**
Manav B. Rahul, James Madison University
Cheng Li, James Madison University
- 3:00 [12] **Knock knock. Who's there? Not relQ? What is *Clostridioides difficile* going to do?**
Areej Malik, Old Dominion University
Adenrele Oludiran, Old Dominion University
Asia Poudel, Old Dominion University
Orlando Berumen Alvarez, Old Dominion University
Erin B. Purcell, Old Dominion University
- 3:15 [13] **Social isolation effects on hedonic behavior and orexin expression in female mice**
Hudson McNerney, University of Mary Washington
Parrish Waters, University of Mary Washington

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

- Poster 14 **Mitigating Inflammatory Bowel Disease (IBD) by Tailoring Biofilm Forming Bioengineered Probiotics**
Zuri A. Jules-Culver, Old Dominion University
Rishi Drolia, Ph.D., Old Dominion University
- Poster 15 **Crayfish as a biological reservoir for the amphibian skin pathogen *Batrachochytrium dendrobatidis***
Kyra A. Goyette, Liberty University
- Poster 16 **Evaluating the effect of glyphosate herbicide on neurodevelopment using the embryonic chick model**
Megan Dufault, Washington and Lee University
- Poster 17 **Assessing progression of muscle phenotypes in an adult-onset model of myotonic dystrophy in *Drosophila melanogaster***

Ashlyn Rauch, University of Mary Washington
Kayla A. Rodriguez, University of Mary Washington

Poster 18 **The Impact of pvr on Muscle Phenotypes in *Drosophila melanogaster***

Delaney Baratka, University of Mary Washington

Poster 19 **Characterization of the *Aspergillus flavus* rdiA gene using a *Cryptococcus neoformans* rdi1 mutant**

Nicholas A. Jones, Liberty University
Michael S. Price, Liberty University College of Osteopathic Medicine
Sean C. Bassham, Liberty University College of Osteopathic Medicine

Poster 20 **A Continuation of Latent Blood Detection and STR Analysis of Samples Collected from an American Civil War Field Hospital; the Authenticated Surgical Table Used for Surgery**

Alyssa M. Spillar, Liberty University
Kristin Mosse, Liberty University
Natalie Spencer, Liberty University

Poster 21 **IDH2 mutation in chondrosarcoma: shedding light on mitochondrial metabolism and cellular physiology**

Caleb C. J. Wyckoff, Old Dominion University
Chris J. Osgood, Old Dominion University
Michael W. Stacey, Old Dominion University

Poster 22 **Immuno-detection and stability of SARS-CoV-2 in milk**

Hannah A. Raso, Virginia Tech
Dominic S. Raso, Pathology Consultants of Central Virginia
Carla V. Finkelstein, Virginia Tech
Andrew P. Biesemier, University of Virginia
Diya Reddy, Virginia Tech
Wraylyn Smith, Virginia Tech

Poster 23 **Examining the tissue-level expression of BURP domain proteins in the model moss *Physcomitrium patens***

John Wampler, Virginia Wesleyan University
Eric E. Johnson, Virginia Wesleyan University

Poster 24 **Steps to characterizing the moss PpBURP5 gene in an *Arabidopsis* triple mutant.**

Trinity Bowens, Virginia Wesleyan University
Eric E. Johnson, Virginia Wesleyan University

Poster 25 **Microglial Inflammation in Alzheimers**

Mikyas Telehun, University of Mary Washington
Deborah A O'Dell, University of Mary Washington
Kristy A. Bagley, University of Mary Washington

Poster 26 **Changes of TOB in Response to Chronic Social Stress**

Hannah Stottlemeyer, University of Mary Washington
Deborah A O'Dell, University of Mary Washington

Poster 27 **Role of GSK-3 In Alzheimer's Disease**

Natalie Baca, University of Mary Washington
Deborah O'Dell, University of Mary Washington

Poster 28 **Identification of select low-molecular weight compounds, found in coffee, that promote glucose homeostasis in 3T3-L1 adipocytes**

Sierra Hall, Liberty University
Dr. William T. Moore, Liberty University
Brooke Chapple, Liberty University
Rochelle Miller, Liberty University

Poster 29 **Influence of SCP1 on *Cryptococcus neoformans* Virulence**

Carleigh J. Warsing, Liberty University

- Poster 30 **Assessing acetylation outcomes of putative proteins in *Cryptococcus neoformans***
 Ethan M. Carlile, Liberty University
 Timothy N. James, Liberty University
 Felice B. Kho, Liberty University
 Dr. Gary D. IsaacsLiberty University
- Poster 31 **Primer design for diverse nematode species**
 Alegria O. Bautista, University of Mary Washington
 Theresa M Grana, University of Mary Washington
- Poster 32 **Enterolactone promotes glucose uptake via a Glut4-dependent mechanism**
 Seth F. Woodfin, Liberty University
 Abigail N. Frommack, Liberty University
- Poster 33 **Comparative Evaluation of Pathogenicity, Cytotoxicity at the Blood-brain barrier, and Antibiotic Susceptibility Profiles in *Listeria Monocytogenes* from Food and Clinical Sources**
 Victoria A. Felton, Old Dominion University
 Hannah Keating, Eastern Kentucky University
 Rishi Drolia, Old Dominion University
- Poster 34 **Exploring the link between *Clostridioides difficile* and nutrient starvation**
 Sean Washington, Old Dominion University
- Poster 35 **Evaluating the use of dextranase against dental plaque formed by *Streptococcus mutans***
 Ebony Arauz Tellez, Longwood University
 Denis Trubitsyn, Longwood University
- Poster 36 **Folliculogenesis in Polycystic Ovaries in the Domestic Cat**
 Rajeev Chandra, Norfolk State University, Norfolk, VA
 Alicia Nolasco, Norfolk State University, Norfolk, VA
 Za'Chari Bey, Norfolk State University, Norfolk, VA
- Poster 37 **Examining the Therapeutic Efficacy of Chemotherapy in Combination with Methionine Restriction in Breast Cancer**
 Abigail E. Glenn, University of Mary Washington
 Laura Sipe, University of Mary Washington
- Poster 38 **Antiviral Effects of Lithium Chloride Against NDV in BHK-21 Cells**
 Aisling Berrios, Student at University of Mary Washington
- Poster 39 **Physiological effects of snacking from weaning to adulthood on the GI tract and abdominal fat pads in a rat model for obesity development.**
 Yewon Shin, Washington & Lee University
 Colleen Curto, Washington & Lee University
 Bridget Osas, Washington & Lee University
 P. BarnesWashington & Lee University
 Penelope Quiles, Washington & Lee University
 Krisan Ennis, Washington & Lee University
 Daniel Lu, Washington & Lee University
 Helen I'Anson, Washington & Lee University
- Poster 40 **Temperature and Sex Determination in TU Line Zebrafish**
 Ravi Palat, University of Mary Washington
 Dianne Baker, University of Mary Washington
- Poster 41 **The generational effect of temperature differences on sex differentiation in *Danio rerio***
 Willa Clore, University of Mary Washington
 Dianne Baker, University of Mary Washington

BIOMEDICAL & GENERAL ENGINEERING

Section Officers

Chair: Paul Wetzel, Virginia Commonwealth University, Dept. of Biomedical Engineering
Vice Chair: Rupak Dua, Hampton University, Dept. of Chemical Engineering
Secretary: Shawn DiRocco, Virginia Commonwealth University, Dept. of Biomedical Engineering
Editor: Vacant
Councilor: Thomas W. Haas, Professor Emeritus, Virginia Commonwealth University

ORAL PRESENTATIONS

Thursday, May 16, 2024
Jepson Science Center
Room 458

- 9:45 [1] **Therapy for Abnormal Muscle Synergies in Stroke Using the ULIX Low-impedance Robot**
Shawn DiRocco, Catholic University of America, Virginia Commonwealth University
Peter Lum, Catholic University of America
- 10:00 [2] **Using calcium-silica ratios to drive carbonate and crystalline calcium silicate hydrate formation in alternative cements**
Suzanne Moore Nguyen, University of Virginia
Andres Clarens, University of Virginia
- 10:15 [3] **Magnetophoretic Rare Cell Isolation**
Megan Hayes, Old Dominion University
Madushan Wickramasinghe, Old Dominion University
Akila Wijesinghe, Old Dominion University
Tim Chen, Old Dominion University
Dharmakeerthi Nawarathna, Old Dominion University
- 10:30 [4] **Development of a Transcranial Magnetic Stimulation system for treatment of rodent models of motor movement disorders**
George R. Weistroffer, U.S. Department of Veterans Affairs
- 10:45 [5] **Determination of behavioral analysis testing for quantification of Parkinsonism in rodents**
Lydia Galvin, U.S. Department of Veterans Affairs
George Weistroffer, US Department of Veterans Affairs
- 11:00 [6] **Staining rat brain tissue for markers of long-term LTP: a journeyman histologist's tale**
Jacob Blagg, U.S. Department of Veterans Affairs
George Weistroffer, U.S. Department of Veterans Affairs (VA)
- 11:15 [7] **Quantitative Analysis of Multiparametric MRI on a Murine Stroke Model**
Anran Zhao, University of Virginia
- 11:30 [8] **Modeling Brain Damage in Football Impacts in Full Body Physics-Based Simulations**
Caleb R. Cassidy, Liberty University
Mark F. Horstemeyer, Liberty University
Rajarshi Roy, Corvid Technologies
Cameron B. Ward, Liberty University
Kevin Lister, Corvid Technologies

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

Poster 42 **Characterization of Acoustic Properties of 3D Printed Materials**

Xander D. Birchfield, Randolph-Macon College
Zachary E. Cullingsworth, Randolph-Macon College

Poster 43 **Predicting the risk of cardiovascular toxicity among cancer patients undergoing chemotherapy**

Pascal Yamlome, Virginia Commonwealth University
Jennifer H. Jordan, Virginia Commonwealth University

BOTANY

Section Officers

Chair: Joshua Kincaid, Shenandoah University

Vice Chair: Robert Wright, Wetland Studies and Solution, Inc.

Secretary: W. John Hayden, University of Richmond

Editor: Joshua A. Kincaid, Shenandoah University

Councilor: Conley McMullen, James Madison University



Rod Simmons is a plant ecologist and conservation biologist, with a background in biology, botany, and geology who has extensively surveyed the flora and natural communities of the mid-Atlantic region, especially the inner Coastal Plain, Fall Zone, and Piedmont of the greater Washington, D.C. area. He is a Research Associate with the National Museum of Natural History, Smithsonian Institution; a member of the Virginia Botanical Associates; former contract botanist for NatureServe, National Park Service, and others; and works closely with the Virginia and Maryland natural heritage programs. He is the author of numerous technical reports, papers, and articles, and has published in scientific journals. He is a member and a past president of the Botanical Society of Washington and serves on the boards of the Virginia and Maryland native plant societies. He is a frequent lecturer and field trip leader for various organizations. He recently retired as Natural Resource Manager and Plant Ecologist for the City of Alexandria, Virginia.

ORAL PRESENTATIONS

Thursday, May 16, 2024
Jepson Science Center
Room 109

- 9:30 [1] **Botanical highlights of the 2023 field season**
W. John Hayden, University of Richmond
- 9:45 [2] **The Virginia Flora Committee: the first 50 years**
Marion B. Lobstein, Northern Virginia Community College
- 10:00 [3] **The Flora of Virginia Project: Launch of the Flora Ambassador Program**
Marion B. Lobstein, Northern Virginia Community College
- 10:15 **Break**
- 10:30 [4] [Invited Speaker] - **Relictual floras and habitats of the Washington, DC, region**
Rod Simmons, City of Alexandria, Virginia
- 11:30 **Botany Section Business Meeting**

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

- Poster 44 **Methane Inhibits the Light Reaction in Photosynthesis**
Carl W. Vermeulen, Camp Community College
- Poster 45 **Investigating Antimicrobial Properties of Atlantic White Cedar Bark Extract**
Alyssa L. Wilkinson, Christopher Newport University
Jamet C. Steven, Christopher Newport University
- Poster 46 **Sap Flow Is Powered by Common Ergogenic Cytoplasmic and Mitochondrial Pathways**
Carl W. Vermeulen, Camp Community College

Poster 47 **Minimal Martian Oxygen Needed for Seed Germination**

Carl W. Vermeulen, Camp Community College

Poster 48 **Conservation genetic analysis of Ozark Milkvetch (*Astragalus distortus* Torrey & A. Gray; Fabaceae), a Critically Imperiled Virginia native**

Emily Poindexter, George Mason University

Ashley Morris, Furman University

Andrea Weeks, George Mason University

Poster 49 **Helping Refuge Managers Find Pre-disturbance Soil Wetness: Refining our Understanding with Early and Latewood Width in Atlantic White Cedar (*Chamaecyparis thyoides* L. (B.S.P.))**

Jordan M. Williams, Christopher Newport University

Robert B. Atkinson, Christopher Newport University

CHEMISTRY

Section Officers

Chair: Vincent DePaul Nziko, Hampton University, Dept. of Chemistry & Biochemistry

Vice Chair: Peter N. Njoki, Hampton University, Dept. of Chemistry & Biochemistry

Secretary: Thomas C. Devore, James Madison University, Dept. of Chemistry & Biochemistry

Editor: Thomas C. Devore, James Madison University, Dept. of Chemistry & Biochemistry

Councilor: Edmund M. N Ndip, Hampton University, Dept. of Chemistry & Biochemistry

ORAL PRESENTATIONS

Thursday, May 16, 2024

Jepson Science Center

Room 225

- 845 [1] **Role of liquid water in the thermal dehydration of metal salt hydrates**
Tom DeVore, James Madison University
- 9:00 [2] **Searching for a Molecular Band-Aid: Small Molecules Bind to Desmoplakin and Prevent Protease-Induced Protein Degradation**
Madeleine Benes, James Madison University
- 9:15 [3] **International collaboration: Engaging graduate students and faculty in nanoscience research at a Kenyan University**
Peter N. Njoki, Hampton University
- 9:30 [4] **GERD- Testing the "Silent Regurgitation" Hypothesis on the Intoximeter EC/IR II Evidential Breath Alcohol Instrument**
Jennie Duffy, Department of Forensic Science
- 9:45 [5] **Revolutionizing Pharmaceutical Analysis: Amisulpride (4-amino-N-[(1-ethylpyrrolidin-2-yl)methyl]-5-ethylsulfonyl-2-methoxybenzamide) Quantification via Innovative Paper Analytical Devices**
Sandra A. Abdellah, Virginia Wesleyan University
Maury Howard, Virginia Wesleyan University
- 10:00 [6] **Sometimes Two are Better Than One: Discovery of New Co-Catalytic Processes**
Trandon Bender, Old Dominion University
- 10:15 **BREAK**
- 10:30 [7] **Simulating molecular diffusion in heterogeneous media**
Ashton Ware, Liberty University
Lianjie Xue, Liberty University
- 10:45 [8] **Evaluating the nonlinear optical properties of some model photoswitchable materials for optoelectronic applications**
Edmund Moses N. Ndip, Hampton University
Keste Ghebreyessus, Hampton University
- 11:00 [9] **Synthesis and evaluations of photo-responsive new materials**
Guijun Wang, Old Dominion University

11:15 [10] **Advancement of stable cobalt(III) complexes for applications in organic synthesis**

Kyle M. Lambert, Old Dominion University
Cylah A. Bruno, Old Dominion University
Jean M. Bray, Old Dominion University
Karen Vargas, Old Dominion University
Shayne M. Weierbach, Old Dominion University

11:30 [11] **Advancing oxidative transformations using oxoammonium salt oxidants for applications in organic synthesis**

Shayne M. Weierbach, Old Dominion University
Kyle M. Lambert, Old Dominion University

11:45 [12] **Confocal surface-enhanced Raman mapping study of the intestinal barrier crossing behavior of 'core-shell' polystyrene nanoplastics in *Daphnia magna***

Anupam Das, Hampton University

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

Poster 50 **A New Bromination Reaction for Organic Chemistry Labs**

Alexander W. Glase, Liberty University
Michael R. Korn, Liberty University

Poster 51 **Multidrug co-crystals and drug-drug salts: Quinine and NSAIDs as pharmaceutical hybrids**

Sarah Chapin, Old Dominion University
SILVINA PAGOLA, Old Dominion University

Poster 52 **Computational approximation of post-transcriptional methylation during mRNA-5'-capping (Cap-1)**

Alena M. Thotam, Hampton University
Insu Hahn, Hampton University
Patricia Makori, Hampton University
Jamilah Watson, Hampton University
Soonae Shuler, Hampton University
Jazmin Barkley, Hampton University

Poster 53 **Atalantums and Bile Duct Center**

Cecilia N. Cruz, Old Dominion University
Karen Vargas, Old Dominion University
Kostantinos Vlasakakis, Old Dominion University
Jean M. Bray, Old Dominion University
Kyle M. Lambert, Old Dominion University

Poster 54 **Molecular Modeling of mRNA-5'-capping (Cap-0) in Post-Transcriptional Modifications**

Jocelyn N. Curry, Hampton University
Morgan D. Bernard, Hampton University
Cooper D. Green, Hampton University
Hayli Bonds, Hampton University
Insu F. Hahn, Hampton University

Poster 55 **Carbonyl additions promoted by cobalt(III) complexes**

Cylah A. Bruno, Old Dominion University
Kyle M. Lambert, Old Dominion University

DATA SCIENCE, COMPUTING & STATISTICS

Section Officers

Chair: Vacant

Vice Chair: Mary Ann Hoppa, Norfolk State University, Dept. of Computer Science

Secretary: Vacant

Editor: Yen-Hung (Frank) Hu, Norfolk State University, Dept. of Computer Science

Councilor: Susan Zehra, Old Dominion University, Dept. of Computer Science

ORAL PRESENTATIONS

Thursday, May 16, 2024

Jepson Science Center

Room 454

10:00 [1] **Penalized Deep Partially Linear Cox Models with Application to CT Scans of Lung Cancer Patients**

Yuming Sun, College of William & Mary

10:20 [2] **Subgradient Methods for Convex Optimization Problems with Application to Image Denoising and Deblurring.**

Obed Amo, Old Dominion University

10:40 [3] **Improving Student Outcomes Through Cybersecurity Upskilling**

Mary Ann Hoppa, Norfolk State University

11:00 [4] **Exploring Potential Cybersecurity Vulnerabilities in Alexa**

Mary Ann Hoppa, Norfolk State University

Lawrence Fitch, Norfolk State University

EDUCATION

Section Officers

Chair: Melani Loney, Old Dominion University, The Center for Educational Partnerships

Vice Chair: Deborah Neely-Fisher, Reynolds Community College, School of Science, Technology, Engineering & Mathematics

Secretary: Vacant

Editor: Swati Agrawal, University of Mary Washington, Dept. of Biological Sciences

Councilor: Se W. Jeong, Regeneron Pharmaceuticals, Dept. of Oncology & Angiogenesis

Poster 56 **Fear to Hope: A case study of communication strategies for advancing collaborative public science research**

Linda D. Manning, Christopher Newport University

Robert B. Atkinson, Christopher Newport University

Poster 57 **Comparison images of deletion vs. RNAi in *C. elegans* for use in Genetics class**

Stephanie L. Bailey, University of Mary Washington

Theresa M Grana, University of Mary Washington

ENVIRONMENTAL AND CONSERVATION and ENTOMOLOGY

Section Officers Environmental and Conservation

Chair: James Haluska, Retired Oceanographer

Vice Chair: Katherine O'Neill, Roanoke College, Dept. of Environmental Studies

Secretary: Chelsea Peterrs, Roanoke College, Dept. of Environmental Studies

Editor: Vacant

Councilor: William Kissner, Environmental Science Teacher, Dinwiddie County High School

Section Officers Entomology

Chair: Thomas P Kuhar, Virginia Tech, Dept. of Entomology

Vice Chair: Kal Ivanov, VA Museum of Natural History, Dept. of Recent Invertebrates

Secretary: Laura McHenry, Virginia Tech, Dept. of Entomology

Editor: Rob Ostrom, Virginia Tech, Dept. of Entomology

Councilor: Shannon Bradley, Old Dominion University, Dept. of Biological Sciences

ORAL PRESENTATIONS

Thursday, May 16, 2024

Jepson Science Center

Room 229

9:00 [1] **Current Condition of Virginia Barrier Island Inlets**

James D. Haluska, Retired Oceanographer

9:15 [2] **Detection of diversity of coastal avian and mammalian fauna**

Oleksii Dubovyk, Old Dominion University

Eric L. Walters, Old Dominion University

Iroshmal Peiris, Old Dominion University

Maizer Sparkman, Old Dominion University

Alex Wright, Old Dominion University

Chi Wei, Old Dominion University

Ella DiPetto, Old Dominion University

9:30 [3] **Crayfish as a biological reservoir for the amphibian skin pathogen *Batrachochytrium dendrobatidis***

Gibson J. Huff, Liberty University

Matthew Becker, Liberty University

Kyle Harris, Liberty University

Ernesto Hurtado Lopez, Liberty University

Abbigail Piddock, Liberty University

Garrett R. Bohrnstedt, Liberty University

9:45 [4] **Public Science Addressing Climate Change: A test of data integrity during authentic research with students in the Fear to Hope project.**

Madelyn A. Steimer, Christopher Newport University

Robert B. Atkinson, Christopher Newport University

- 10:00 [5] **Improving the Accuracy of the Carbon Budget of Coastal Peatlands With the Addition of Buried Logs**
Jonathon Russo, Christopher Newport University
Robert.B. Atkinson, Christopher Newport University
- 10:15 [6] **In-Situ Hydrogen Generation from Waste Hydrocarbon Residue: Two-Phase Microbial Electrolysis Cells for Sustainable Energy in Abandoned Oil and Gas Reservoirs**
Georgia M. Barefoot, James Madison University
Cheng Li, James Madison University
- 10:30 **BREAK**
- 10:45 [7] **Treating wastewater and generating clean energy with sediment microbial fuel cells.**
Christian D. Ward, James Madison University
Cheng Li, James Madison University
Ben T. LaRocque, James Madison University
- 11:00 [8] **Hydrogen Production Using Waste Glycerol By-Product of Biodiesel through Microbial Electrolysis Cells**
Maria D. Kruml, James Madison University
Cheng Li, James Madison University
- 11:15 [9] **Endoparasites Induce Differential Hemodynamics in Mosquito fish**
Garrett R. Bohrnstedt, Liberty University
Ernesto Hurtado Lopez, Liberty University
Alan Gillen, Liberty University
Gibson HuffLiberty University
Abbigail Piddock, Liberty University
Kyle Harris, Liberty University
- 11:45 [11] **Utilizing a hybrid swarm approach to assess the phenotypic contributions of the inversion In(2L)t in *Drosophila melanogaster***
Abigail Hayes, University of Virginia
Grace Miller, University of Virginia
Alan Bergland, University of Virginia

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

- Poster 58 **Backyard Evolution: a citizen science project to track seasonal evolution and metapopulation structure in fly communities in compost piles**
Megan Stephenson, University of Virginia
Megan Delamont, University of Virginia
Abigail Hayes, University of Virginia
Joaquin NunezUniversity of Vermont
Alan Bergland, University of Virginia
- Poster 59 **Parental partitioning and nest success in the Eastern Bluebird (*Sialia silius*)**
Genesis Bishop, Liberty University
Via Wilburn, Liberty University
Julia Weinand, Liberty University

- Poster 60 **Effects of artificial light at night on bat activity and species composition in an old growth urban forest**
Katelyn M. Baker, Virginia Wesleyan University
- Poster 61 **Understanding the impacts of zinc pollution on benthic invertebrates through a multi-stressor lens**
Jacob B. Gynan, Old Dominion University
Gloria Massamba N'Siala, Old Dominion University
- Poster 62 **Developing a Calcium Budget for AWC stand in GDS**
Noah Tidman, Christopher Newport University
Rob Atkinson, Christopher Newport University
Jonathon Russo, Christopher Newport University
- Poster 63 **Investigating Antimicrobial Properties Released from Developing Amphibian Eggs**
Anna P. Mayberry, Liberty University
Elizabeth R. Williams, Liberty University
Summer J. Cartwright, Liberty University
Olivia Grimsley, Liberty University
Kyle Harris, Liberty University
Matthew Becker, Liberty University
- Poster 64 **Parental partitioning and nest success in the Eastern Bluebird (*Sialia silius*)**
Genesis Bishop, Liberty University
Julia Weinand, Liberty University
Via Wilburn, Liberty University
Gene Sattler, Liberty University
Kyle Harris, Liberty University
Matthew Becker, Liberty University
- Poster 65 **Fecal Quality as an Indicator of Red Panda (*Ailurus spp.*) Health: Impacts and Applications**
Maya F. Beumer, George Mason University
Sarah M. Huskisson, MS, George Mason University
Elizabeth W. Freeman, PhD, George Mason University
Nucharin Songsasen, DVM, PhD, Smithsonian Conservation Biology Institute
Kristina M. Delaski, DVM, DACZM, Smithsonian Conservation Biology Institute

PSYCHOLOGY

Section Officers

Chair: Vacant

Vice Chair: Vacant

Secretary: Abby Braitman, Old Dominion University, Dept. of Psychology

Editor: Vacant

Councilor: Vacant

ORAL PRESENTATIONS

Thursday, May 16, 2024

Jepson Science Center

Room 219

11:00 [1] **Testing a Measure of Aggression for Anti-black Racial Bias**

Amaya Woods, Virginia State University

Samuel West, Virginia State University

11:15 [2] **Sadistic Vengeance: Exploring the Relationships Between Sadism and Preferences for Revenge**

Faith A. McLaurin, Virginia State University

Samuel West, Virginia State University

11:30 [3] **Recidivism: A Path Analysis of the Direct Effects of Risk Contributors, Coping Skills, and Substance Abuse Severity**

Kathryn Smith, Virginia State University

POSTER PRESENTATIONS

Thursday, May 16, 2024

Hurley Convergence Center Atrium

Poster 66 **Understanding Body Image In Black Women: A Conceptual Framework on Beauty Ideals, Racial Identity, and Body Image Satisfaction**

Kristina Jean-Baptiste, Virginia State University

Poster 67 **Association between Cannabis Use Frequency and Physical Activity among Undergraduate Students**

Diamond M. Adams, Virginia State University

Larry D. Keene, Virginia State University

Poster 68 **Critically Examining the Experiences of Black Women in STEM Using an Anti-deficit Framework on Science related Attitudes and Imposter Syndrome**

Jlynn M. Holland-Cecil, Virginia State University

Poster 69 **Developing a Scale for Perception of Parental Alcohol Behaviors.**

Morgan N. Hoyt, Randolph-Macon College

Alyssa Mikytuck Ph.D., Randolph-Macon College

Poster 70 **The Relationship Between LGB Bias and Attitudes about Gay and Lesbian Stereotypes**

Ivan Ash, Old Dominion University

Ashley Laws, Old Dominion University

Julia Strickland, Old Dominion University

- Poster 71 **Cultivating Well-being: Cannabis Use and Psychological Flourishing**
 Zhanna Mizgina, Old Dominion University
 Samantha A. Fitzer, Old Dominion University
 Stephen N. Hanson, Old Dominion University
 James M. Henson, Old Dominion University
- Poster 72 **Essence of Faith: Primal World Beliefs and Religiosity Explored**
 Ian R. Allen, Old Dominion University
 Katelyn J. Haschke, Virginia Consortium in Clinical Psychology (VCPCP)
 Samantha A. Fitzer, Old Dominion University
 James M. Henson, Old Dominion University
- Poster 73 **Examining the Moderating Effects of Gender and Sexual Assault on Trauma-related Eating to Cope**
 Kaytlin M. Armitage, Old Dominion University
 Kayla M. MacPherson, Old Dominion University
 Dr. Sage E. Hawn, Old Dominion University
- Poster 74 **Sexual Minority Differences across Various Self-Medication Behaviors**
 Taylor Kliebhan, Virginia Consortium Program in Clinical Psychology
 Sage E. Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology
- Poster 75 **Examination into the Moderating Effects of Resilience Capacity on the Relationship Between Interpersonal Trauma and Internalizing/Externalizing Symptomology in Black College Students**
 Anita S. Thomas, Old Dominion University
 Niya S. Richardson, The University of Massachusetts Boston
 Mellyssa G. Deoliveira, The University of Massachusetts Boston
 Sage E. Hawn, Old Dominion University
- Poster 76 **Examination of the Association between Various Childhood Trauma Types and Disordered Eating in a College Sample.**
 Kayla MacPherson, Old Dominion University
 Kaytlin Armitage, Old Dominion University
 Sage E. Hawn, Old Dominion University
- Poster 77 **Examination of Trauma-Specific Coping Motives for Cannabis Use as a Moderator of the Association between PTSD and Cannabis Use**
 Daniela M. Chaname, Old Dominion University
 Sage Hawn, Old Dominion University
 Max Ragland, Old Dominion University
- Poster 78 **Emotion Regulation and Parasympathetic Nervous System Functioning in Parents**
 Ansley B. Crutchfield, William & Mary
 Madelyn H. Labella, William & Mary
- Poster 79 **Interactions between Positive Allosteric Modulation of Muscarinic Acetylcholine Receptors and Orexin Receptor Antagonism in Cognitive Flexibility in Rats (*Rattus Norvegicus*)**
 Mutian Li, William & Mary
 Joshua A. Burk, William & Mary

Poster 80 **Can Zebrafish (*Danio rerio*) Use Visual-Only Cues to Detect Conspecifics' Response to Synthetic Alarm Substance, Hypoxanthine-3N-Oxide (H3NO)**

Kaitlyn A. Kinslow, Christopher Newport University
Bandhavi Surisetty, Christopher Newport University
Megan Bowers, Christopher Newport University
Ethan Hoffman, Christopher Newport University
Joy Kanapala, Christopher Newport University
Jamie Martin, Christopher Newport University
Ryan Caterbone, Christopher Newport University
Trent Kirchoff, Christopher Newport University
Sanai Williams, Christopher Newport University
Maggy Dwyer, Christopher Newport University
Andrew Velkey, Christopher Newport University

Poster 81 **Oral L-dopa May Have Differential Effects on Impulsive Responding across Females and Males in *Betta Splendens*.**

Drew R. Durante, Christopher Newport University
Kate S. Watson, Christopher Newport University
Ethan Hoffman, Christopher Newport University
Jamie Martin, Christopher Newport University
Rachel C. Glather, Christopher Newport University
Megan E. Bowers, Christopher Newport University
Micaela Flores-Vaccari, Christopher Newport University
Payton E. Harris, Christopher Newport University
Trent D. Kirchoff, Christopher Newport University
Markham M. Puhlick, Christopher Newport University
Andrew Velkey, Christopher Newport University

Poster 82 **Just Keep Swimming: Assessing the Impact of Choice Similarity on Choice Paralysis in Zebrafish through an Instrument Response Discrete Choice.**

Markham M. Puhlick, Christopher Newport University
Kailynne D. Landry, Christopher Newport University
Abigail Paulikonis, Christopher Newport University
Debra Beverly, Christopher Newport University
Emma McIntyre, Christopher Newport University
Jamie Martin, Christopher Newport University
Johana Bonilla, Christopher Newport University
Maggy Dwyer, Christopher Newport University
Micaela Flores-Vaccari, Christopher Newport University
Payton E. Harris, Christopher Newport University
Rachel C. Glather, Christopher Newport University
Andrew Velkey, Christopher Newport University

STRUCTURAL BIOLOGY, BIOCHEMISTRY & BIOPHYSICS and MATERIALS SCIENCE

Section Officers Structural Biology, Biochemistry & Physics

Chair: Nathan T. Wright, James Madison University, Dept. of Chemistry & Biochemistry

Vice Chair: Randall Reif, University of Mary Washington, Dept. of Chemistry

Secretary: Christopher Berndsen, James Madison University, Dept. of Chemistry & Biochemistry

Editor: Vacant

Councilor: Vacant

Section Officers Materials Science

Chair: Vacant

Vice Chair: Ram Gupta, VA Commonwealth University, College of Engineering

Secretary: David L. Green, University of Virginia, Dept. of Material Sciences & Engineering

Editor: Costel Constantin, James Madison University, Dept. of Physics & Astronomy

ORAL PRESENTATIONS

Thursday, May 16, 2024

- 10:00 [1] **Measuring cellular mechanics using image analysis techniques to provide evidence for a molecular pathway involving obscurin**
Stephanie N. Ouderkirk, James Madison University
- 10:20 [2] **Piecing Together the Protein Puzzle: Enhancing Complex Disease Mechanism Research with LexA - *E. coli* Two Hybrid Protein Interaction Analysis**
Rebecca M. Richardson, Old Dominion University
Dayle Daines, Old Dominion University
- 10:40 [3] **Biochemical and Biophysical characterization of a putative UMP kinase protein from *E. histolytica***
Graham Chakafana, Hampton University
Komala Ponniah, Hampton University
Steven M. Pascal Hampton University
- 11:00 [4] **Regulation of cargo transporters in physiological and pathological states**
Marija Corluka, Virginia Tech
Tiffany Roach, Virginia Tech
Daniel Capelluto, Virginia Tech
- 11:20 [5] **NanoDiffusion: An Ultra-Precision, Compact Powder Optimization System for Advancing Nanoparticle Cancer Treatment and Battery Applications**
Oliver Wang, University of Maryland College Park

POSTER PRESENTATIONS

Thursday, May 16, 2024
Hurley Convergence Center Atrium

Poster 84 **Engineering flavin dependent enzymes for structural studies**

Kaleigh M. Ballagh, Virginia Tech

Poster 85 **Biophysical and functional characterization of *N. gonorrhea* inorganic pyrophosphatase**

Napassorn Poolsawat, Hampton University
Graham Chakafana, Hampton University
Finley Payne, The Governor's School for Science and Technology
Shane Taylor Hampton University
Alex Mendez, Hampton University
Cydni Bolling, Hampton University

Poster 86 Intentionally blank

Poster 87 **Going Green: Illuminating Alarmone Synthesis in *C. difficile***

Lane Tong, Old Dominion University
Erin B. Purcell, Old Dominion University

Poster 88 **Piecing Together the Protein Puzzle: A LexA - *E. coli* Two Hybrid Approach to Investigate Human Protein-Protein Interactions**

Rebecca M. Richardson, Old Dominion University
Dayle Daines, Old Dominion University
Komala Ponniah, Old Dominion University
Steven M. Pascal Old Dominion University

Poster 89 **Effects of proton pump inhibitors on the growth of Jurkat T Lymphocytes**

Emma Jones, University of Mary Washington
Caroline Sampson, University of Mary Washington
Randall Reif, University of Mary Washington

Poster 90 **Effects of Molecular Weight of PCL on Electrospun PCL Properties**

Karen Sasakura, University of Richmond
Manasa Rajeev, University of Richmond
Christine Helms, University of Richmond

Poster 91 **NanoDiffusion: An Ultra-Precision, Compact Powder Optimization System for Advancing Nanoparticle Cancer Treatment and Battery Applications**

Oliver Wang, University of Maryland

Nominations for VAS Fellows

Virginia Academy of Science members are invited to submit nominations for Fellows to be named at the 2024 Annual Meeting. A potential Fellow must be an *active member of the Academy* and have contributed to science in one or more of the following ways: (a) outstanding scientific research, (b) inspired teaching of science, or (c) significant leadership in the Academy.

Nomination letters, with adequate supporting information, must be received by the Executive Officer no later than October 1. Nominations will be forwarded to the Awards Committee for consideration and possible recommendation to Council. Upon recommendation to Council, election to Fellow status will be by majority vote of the Academy Council.

To be considered by the Awards Committee, each nomination letter must be signed by at least three Academy members making and/or supporting the nomination. Alternatively, each person supporting the nomination may submit an individual nomination letter. The nomination letter should include detailed biographical information and adequate supporting information (including a current CV or resume) to be used by the members of the Awards Committee and the Academy Council in evaluating the credentials of the nominee for Fellow status. The supporting information should be in a form appropriate for subsequent publication in the *Virginia Journal of Science* and/or *Virginia Scientists*.

Additional information about the Selection of Fellows may be found in the 1999 Spring issue of the *Virginia Journal of Science* [50(1):77] or may be accessed at www.vacadsci.org/fellows

For additional information, contact VAS Executive Officer, Dr. Philip Sheridan at psheridan@vacadsci.org or 804-633-4336.

Nomination letters with supporting materials for FELLOWS should be sent to:

Philip Sheridan, Executive Officer
Virginia Academy of Science
2500 W. Broad Street
Richmond, Virginia 23220.

or email to psheridan@vacadsci.org with 'VAS FELLOWS' as the subject line. Deadline for receipt of nominations and support materials is October 1.

Nominations for VAS Honorary Life Members

At the 1999 Annual Meeting, the VAS Council approved a number of changes in the By-Laws. One of these changes was to establish a new category of membership, Honorary Life Membership, to honor persons for long and distinguished service to science. Honorary Life Members will have all the rights and privileges of Regular Members but will be exempt from paying dues. Previous active membership in VAS is not a requirement for eligibility.

VAS members are invited to submit nominations for Honorary Life Members to be named at the Annual Meeting. **Nomination letters, with adequate supporting information, must be received by the Executive Officer no later than October 1.** Nominations will be forwarded to the Awards Committee for consideration and possible recommendation to Council. Upon recommendation to Council, election to Honorary Life Member status will be by majority vote of the Academy Council.

In order to be considered by the Awards Committee, each nomination letter must be signed by at least three Academy members making and/or supporting the nomination. Alternatively, each person supporting the nomination may submit an individual nomination letter. The nomination letter should include detailed biographical information and adequate supporting information (including a current CV or resume) to be used by the members of the Awards Committee and the Academy Council in evaluating the credentials of the nominee for Honorary Life Membership status. The supporting information should be in a form appropriate for subsequent publication in the Virginia Journal of Science and/or Virginia Scientists. Additional information about the Selection of Honorary Life Members may be found in the 1999 Spring issue of the Virginia Journal of Science [50(1):77] or may be accessed at www.vacadsci.org/honlifememb.htm.

For additional information, contact VAS Executive Officer, Dr. Philip Sheridan at psheridan@vacadsci.org or 804-633-4336.

Nomination letters with supporting materials for HONORARY LIFE MEMBERS should be sent to:

Philip Sheridan, Executive Officer
Virginia Academy of Science
2500 W. Broad Street
Richmond, Virginia 23220

or email to psheridan@vacadsci.org with 'VAS HONORARY LIFE MEMBER' as the subject line.

Deadline for receipt of nominations and support materials is October 1.

Selected Programs of the Virginia Academy of Science

The Virginia Journal of Science is America's fourth largest state academy journal in circulation (after New York, Chicago, and Ohio) and goes to 47 states and 12 countries overseas. A professionally refereed quarterly, ***The Journal*** publishes original research articles and research notes in the various disciplines of science, mathematics, and engineering: cross-disciplinary papers on advances in science and technology and their impact on society are invited. Minutes of The Academy and notices are also published. Many significant contributions were first published in ***The Journal*** and its articles have a high rate of citation. Authors are allowed the first 15 pages, including figures, without charge (\$50 per page for the 16th subsequent pages). Selected back issues available.

For additional information, contact Christopher Osgood at cosgood@odu.edu or 757-683-6778.

Virginia Scientists, the Academy's newsletter is published three times yearly and serves to communicate information about the Academy; regional conferences; various state science institutions; organizations, agencies, and corporations; and Virginia's researchers, science educators, and their students. Articles and notices are cordially invited. In addition to members, it is sent to Virginia legislators, selected agencies, and college and university presidents.

For information, contact William Kissner at wkissner@dcpsnet.org.

The **Virginia Junior Academy of Science** is one of the Nation's foremost junior academies. In addition to the nationally recognized annual refereed paper competition involving hundreds of volunteers, VJAS and VAS programs reach about 40,000 Virginia secondary students each year. Over \$80,000 in scholarships, prizes, research support grants, trips to national meetings and events are awarded annually. Scientists and science educators are encouraged to adopt school science programs, classes, and clubs; to provide information on Academy programs; and to foster new clubs and opportunities for Virginia's youth.

For additional information, contact Susan P. Booth at susan.science@gmail.com or 757-897-3104.

Fall Undergraduate Research Meeting: In Fall 2001 VAS held the first Fall Undergraduate Research Meeting which focused on support of undergraduate student research. Subsequently this meeting has been held on an annual basis. Awards of \$750 or greater are given to top student proposals that are chosen by judges. Guidelines and location for the Fall Meeting can be found on the VAS website. The 2024 Fall Meeting is set for November 9, 2024 at Ferrum College.

To obtain additional information about the Fall Undergraduate Research Meeting, you can go directly [to our website](#) or contact Philip M. Sheridan, Executive Officer, Virginia Academy of Science at psheridan@vacadsci.org or 804-633-4336.

VAS and VJAS Scientific Research Grants, Awards, Scholarships, Assistantships, etc. are made possible by hundreds of corporate and individual donors who believe in our work to benefit the People of Virginia. Many have found this a meaningful way to memorialize a loved one, support a student's education, or recognize the work of a colleague.

To Create an Endowment or Make a Donation, you can go directly [to our website](#), or contact Philip M. Sheridan, Executive Officer, Virginia Academy of Science at psheridan@vacadsci.org or 804-633-4336.

For Information and Applications for Research Grants, you can go directly [to our website](#) or contact Philip Sheridan, Executive Officer, Virginia Academy of Science at psheridan@vacadsci.org or 804-633-4336.

To become a Member, Institutional Member, or Business Member, you can go directly [to our website](#) or contact Philip Sheridan, Executive Officer, Virginia Academy of Science at psheridan@vacadsci.org or 804-633-4336.

Virginia Academy of Science Website

www.vacadsci.org

Selected Highlights of the First Hundred Years of the Virginia Academy of Science, 1923-2023

On April 26, 1923, 135 scientists and science educators convened in Williamsburg at The College of William and Mary to form the Virginia Academy of Science (VAS). In the ten decades since, the VAS has nurtured successive generations of scientists, advocated for science education, supported scientific research, and promoted science-based decision-making in our Commonwealth and in society. Among the Academy's significant accomplishments and activities in its first 100 years are these:

Public Service

- In partnership with the Garden Clubs of Virginia and the Izaak Walton League, met in 1929 to establish the **Virginia State Parks** system, which opened with six parks in 1936
- In the 1960s, lobbied vigorously to create the **Science Museum of Virginia**; the museum dedicated its first exhibit gallery in 1977
- Established and administers the **Kiser Fund for Science Teacher Education**, which makes awards annually
- Has provided **scientific advice** to Virginia governors and state agencies, beginning with the state's kepone disaster in the 1970s

Science Education in Grades preK-12

- Has been involved in hundreds of **teacher education and training programs** in the sciences, mathematics, medicine, and technology
- Founded the **Virginia Junior Academy of Science (VJAS)** in 1941 to foster original research in Virginia middle and high schools
- Numbering more than 100 affiliated schools, the VJAS provides a **national model for state junior science academies**; it has been ranked among the top three junior academies in the nation for over two decades
- Established the **VJAS Research Fund** that supports scientific investigations by Virginia's secondary school students
- Features more than 500 science research presentations by middle and high school students in the **Annual VJAS Research Symposium**; awards over \$80,000 in sponsored or endowed scholarships and prizes each year to Virginia middle and high school students for original research
- Brings together **secondary school students with research mentors** at Virginia colleges and universities each year; students visit campuses and conduct research under professors' mentorship
- Worked with the Virginia Department of Education to develop **two diploma seals to encourage and recognize science achievement by the Commonwealth's high school students**: The Board of Education's Diploma Seal for Science, Technology, Engineering and Mathematics (STEM); and The Board of Education's Seal for Excellence in Science and the Environment. The first seals were awarded in 2021 and 2022.

Supporting Scientific Research

- Established, with the early support of the DuPont family, the first **scientific research fund** in Virginia; continues to award funds for research
- Beginning in 2001, has sponsored the **Annual Fall Undergraduate Research Meeting** to encourage and financially support collaboration by students and faculty in conducting original research as part of science curricula in four-year and two-year colleges and universities
- Founded the **Virginia Institute for Scientific Research** (established at the University of Richmond), the forerunner of Virginia's Center for Innovative Technology (CIT), which is funded in part by the Virginia General Assembly

Research Publications

- Published the *Flora of Richmond and Its Vicinity* (1930)
- Founded the *Virginia Journal of Science* in 1940 and continues to publish this research periodical
- Published *The James River Basin: Past, Present and Future* (1950), which was funded by the Virginia General Assembly; the book provides the first comprehensive, multidisciplinary account of the James and its resources, landforms, flora, fauna, industries, and businesses
- Part of the leadership team for the development and publication of the *Flora of Virginia* in 2012; the *Flora* is the first comprehensive guide to the Commonwealth's vascular plants published since 1762 (250 years earlier)

Social Justice, Education, and Environmental Protection

- In 1925, Academy leaders **submitted testimony in *The State of Tennessee v. John Thomas Scopes***, in which high school teacher John Scopes was tried for teaching evolution, a violation of state law at the time
- Supported **the inclusion of women and persons of color** in professional meetings of scientists and science educators
- Enacted resolutions supporting the **modern theory of evolution** and its teaching (1981), the Talloires Declaration on **environmental sustainability** (1993), the importance of **laboratory experiences in science education** (1995, 1996), the **elimination of coal ash ponds** (2018), the **conversion to renewable energy** (2019), and the **reduction of greenhouse gas emissions** (2022)

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***Prepared by the Virginia Academy of Science, Ad Hoc Committee
on Publicity, 2019-2020***

***For further information about the Virginia Academy of Science:
www.vacadsci.org***

Alternate Lunch Options

If you registered late and we did not plan for you to have lunch on campus (or would simply prefer other culinary options) there are numerous dining options that are walkable from campus.

Easily Walkable

My Casa Mexican Restaurant 0.1 mi
2018 College Ave, Fredericksburg, VA 22401

McDonald's 0.2 mi
1212 Emancipation Hwy, Fredericksburg, VA 22401

Pizza Hut 0.2 mi
1224 Powhatan St, Fredericksburg, VA 22401

Walkable-In the Shopping center across Rt 1-use the Pedestrian Bridge

Baba Ganoush Mediterranean Grill 0.3 mi
1115 Emancipation Hwy, Fredericksburg, VA 22401

Rey Azteca 0.3 mi
1115 Emancipation Hwy, Fredericksburg, VA 22401

Patriot Subs 0.4 mi
1115 Emancipation Hwy, Fredericksburg, VA 22401

Crimson Coward Chicken Restaurant 0.4 mi
1217 Emancipation Hwy, Fredericksburg, VA 22401

Kumo Sushi 0.5 mi
1115 Emancipation Hwy, Fredericksburg, VA 22401

Across Rt 1, but less walkable

Sabor de Mexico 0.6 mi
1217 Emancipation Hwy, Fredericksburg, VA 22401

Parthenon Restaurant Greek Restaurant
2024 Augustine Ave, Fredericksburg, VA 22401

Renee's Creperie
2024 Augustine Ave, Fredericksburg, VA 22401

Allman's Bar-B-Que
1299 Emancipation Hwy, Fredericksburg, VA 22401

Miso Asian Grill & Sushi Bar
1305 Emancipation Hwy, Fredericksburg, VA 22401