Virginia Academy of Science

103rd Annual Meeting

May 22, 2025

University of Virginia
Charlottesville, 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 in 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.
*We always appreciate faculty who are willing to serve as judges at our Fall meeting. If you are interested, please contact the president-elect (*president-elect@vacadsci.org).

Our ***Spring Meeting*** is a traditional exposé of undergraduate and graduate research. We have enjoyed over 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

Table of Contents

Photos:

Want to share photos from the meeting? Feel free to post them here.
Note: anything you share might be used by VAS on our webpage or in programs like this one!

2025 Officers of the Virginia Academy of Science

President Parrish Waters**,**
University of Mary Washington
Fredericksburg, VA

President-Elect.....Christopher Osgood. Old Dominion University, Norfolk, VA
Vice-President.....Craig Group. University of Virginia, Charlottesville, VA
Secretary.....Robin Curtis. Virginia Junior Academy of Science
Treasurer.....April Wynn. University of Mary Washington, Fredericksburg, VA
Executive Officer..... Vacant. Virginia Academy of Science, Richmond, VA

Map of the UVA Campus

(relevant region for the VAS Meeting)

Parking is free and will be in a marked area at the UVA football stadium.

Check in at the Chemistry building.

Full interactive visitor map here.

VAS President's Welcome

May 2025

Welcome to the 103rd Annual Meeting of the Virginia Academy of Science. The Academy has had an exciting and productive year. Thanks to the dedication of our volunteers and staff, we have made real progress toward our goals of promoting science literacy and fostering a vibrant scientific community across Virginia.

We have strengthened our relationship with the Science Museum of Virginia and look forward to continued collaboration around our shared mission. A new initiative is underway to connect grade school teachers and professors across the state, creating opportunities to share curricula and teaching strategies.

Our Fall Symposium has expanded its reach, and in 2024 we were proud to award ten $900 grants to undergraduate researchers. We hope to expand this even further in 2025.

This Annual Spring Meeting highlights the breadth of scientific work happening throughout Virginia. This year, we're thrilled to have nearly 200 presentations—a powerful reflection of a thriving scientific community in our state. We are also excited to host the keynote Negus Lecture, delivered by Ken Ono, which will explore how data analytics can enhance athletic performance.

We extend our sincere thanks to the University of Virginia and the faculty and staff who made this meeting possible. I look forward to a successful event and continued momentum in the year ahead.

Thank you for being a member of the Virginia Academy of Science.

Sincerely,

Parrish Waters
President of the Virginia Academy of Science, 2024-2025
Associate Professor of Biology
University of Mary Washington

In 1819, Thomas Jefferson founded the University of Virginia and inaugurated a bold experiment – a public university designed to advance human knowledge, educate leaders, and cultivate an informed citizenry.

More than two centuries later, this vision is thriving. Across Grounds - and throughout the world - UVA students, faculty, staff, and alumni challenge convention, break barriers, and pursue the greater good.

The University is an iconic public institution of higher education, boasting nationally ranked schools and programs, diverse and distinguished faculty, a major academic medical center, and a proud history as a renowned research university. The community and culture of the University are enriched by active student self-governance, sustained commitment to the arts, and a robust NCAA Division I Athletics program.

As one of the nation's leading public institutions, UVA pushes the boundaries of what's possible, always in the name of the greater good. One of the things that makes this possible is an unswerving commitment to initiatives that grow, strengthen, and shape our institution for the future.

Enjoy your visit to UVA today. Most of the meeting will be in buildings located on our recently renovated science corridor. If time permits, explore the central Grounds and the Rotunda, a World Heritage Site.

Welcome from President Jim Ryan

May 2025

Dear Members of the Virginia Academy of Science,

I'm delighted to welcome you to the University of Virginia for your annual meeting. Scientific research, teaching, and discovery are at the core of our mission as a public university. Your work helps us to understand the world, improve lives in the communities that we serve, and address some of the most pressing issues of our time, from healthcare and climate change, to data science and artificial intelligence, and more.

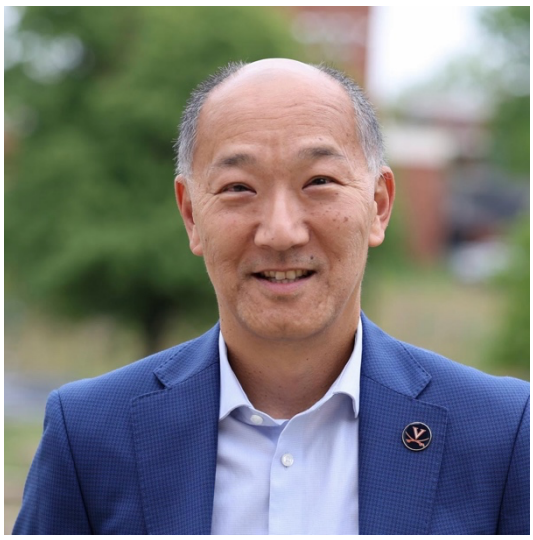
This is a challenging time for the research enterprise generally, as you well know. But the questions you are asking, the research you are conducting, and the students whom you are teaching and inspiring remain more important than ever. Here at UVA, we continue to support and celebrate research and teaching that make a difference. We will continue to ask important questions about the most pressing issues of our time. And we will continue to work with our colleagues across the Commonwealth to support the scientific community both now and in the future. As Thomas Jefferson, the founder of UVA, said: we are not afraid to follow truth wherever it may lead.

Thank you for your work, and thank you for making the journey to Charlottesville. I hope that you have a productive and enjoyable visit, and that you continue to rely on your colleagues across the Commonwealth in the months and years ahead.

Best,

Jim Ryan
President
University of Virginia

Sydney S. Negus Memorial Lecture VAS Academy Conference



Title: Swimming in Data

Abstract:
This talk will showcase the potential of data analytics, mathematics and physics in improving athletic performance in elite swimming. The speaker has worked with UVA's swimming team and Team USA for the last two Olympic cycles, and this approach has helped athletes set 50+ American records and win 100+ Olympic and World Championship medals.

Bio:

Ken Ono is the STEM Advisor to the Provost and the Marvin Rosenblum Professor of Mathematics. His research expertise includes data science, mathematics, and statistics. He has received a Guggenheim Fellowship, Packard Fellowship, Sloan Fellowship, an NSF CAREER Award, and a PECASE Award from President Clinton. In 2005, he was named an NSF Director's Distinguished Teaching Scholar. He is a Fellow of the American Mathematical Society, an Honorary Member of the Indian Academy of Sciences, and an Honorary Member of the Romanian Academy of Sciences. His service includes various leadership roles, such as Vice President of the American Mathematical Society, Chair of the Mathematics Section of the American Association for the Advancement of Science, member of the NSA Advisory Board, member of the US National Committee for Mathematics at the US National Academy of Sciences, member of the advisory board of the Conference Board of the Mathematical Sciences, US delegate to the General Assembly of the International Mathematics Union, and Chairman of the UVA Department of Mathematics. He earned his Ph.D. in Mathematics from UCLA in 1993, and his B.A. in Mathematics from the University of Chicago in 1989.

VAS Spring 2025 Conference Schedule

Thursday, May 22

8:00-10:00 am Check-in and Poster Setup (Coffee and Light Pastries)
Chemistry Atrium

8:30-12:30 pm *Oral Presentations (Section schedules later in the program)*

Astronomy, Math, Physics
Physics 338

Biology-Microbiology & Molecular Biology
Session 1: Gilmer 390
Session 2: Gilmer 247

Biomedical and General Engineering
Chemistry 306

Botany
Physics 218

Chemistry
Chemistry 217

Entomology
Ridley Hall Room 139

Environmental and Conservation Science
Ridley Hall Room 137

Geology
Physics 217

Materials Science
Physics 220

Psychology
Gilmer 245

Structural Biology, Biochemistry and Biophysics
Chemistry 306

12:00–12:30 pm Section Business Meetings

12:45-1:00 pm VAS Photo – front steps of Alumni Hall

1:00-2:45 pm Lunch and Negus Lecture
Alumni Hall

3:00-3:30 pm Fellow's meeting
Chemistry 306

3:00-5:00 pm ***Poster Sessions-*** *Poster authors will be present to discuss and answer questions*
Chemistry 2nd, 3rd, and 4th floor

Note: UVA Graduate Recruiting Table during check-in and Poster Session!

5:00-6:00 pm Awards Ceremony Chemistry 402

9:00-10:30 pm A Night at McCormick Observatory!

Friday, May 23

9:00 am-noon VAS Council Breakfast and Meeting (VAS Council Members Should Attend)

Alumni Hall Board Room

A Night at McCormick Observatory

A special event for the Virginia Academy of Science!
Ed Murphy, UVA Astronomy Department

McCormick Observatory was dedicated on Thomas Jefferson's birthday, April 13, in 1885. When it was completed, it was the largest telescope in the United States and the second largest refractor (lens telescope) in the world. The telescope has been in continuous use by the Astronomy Department for 140 years, though today it is used for education and outreach. The telescope was built by Alvan Clark and Sons, considered by many to be the greatest telescope makers of the 19th Century. The McCormick 26-inch is the largest, extant, Clark telescope on a Clark mount in the world (his later, larger, objective lenses were mounted in telescopes made by Warner and Swasey). We consider it to be the finest example of the workshops of Alvan Clark and Sons.

Come tour the observatory! If the weather treats us well, you can operate this beautiful telescope and observe the awe of the night sky.

ASTRONOMY, MATH & PHYSICS (abstracts)

Section Officers:
Chair: Craig Group, University of Virginia, Dept. of Physics
Vice Chair: Charles R. Crook, Retired
Secretary: Joseph D. Rudmin, James Madison University, Dept. of Integrated Sciences & Technology
Editor: Desmond Villaba, University of Mary Washington, Dept. Physics and Applied Physics
Councilor: Marco Aldi, Virginia Commonwealth University, Dept. of Mathematics and Applied Mathematics

ORAL PRESENTATIONS

Physics Building
Room 338

08:50 Welcome From AMP Section Chair
Craig Group, University of Virginia

09:00 Searching for Dark Matter at the NOvA Neutrino Experiment
Josh Greaves, University of Virginia

09:15 The Assembly and Testing of the Barrel Timing Layer for the CMS Experiment at the LHC
Sydney Dixon, University of Virginia
Bryan Cardwell, Carter Patten, Christian Guinto-Brody, Jack Shadel, Lanie Barnett, Maria Jose, Chris Neu, Reshma Menon Raghunandanan, Taylor Conner, Zach Rios & Zhenyu Wu, University of Virginia

09:30 A Strict Physicality-Preserving Scheme for a 2D Q-Tensor Flow with a Singular Potential
Md Mashud Parvez, Old Dominion University
Xiang Xu, Old Dominion University

09:45 Team Slim Shady NASA HOEE Starshade Challenge
Dylan Knick, Roanoke College
Addy L. Littlefield, Roanoke College

10:00 Galaxy Properties, Cross-comparisons, and Environmental Dependence
Sean Swick, University of Mary Washington
Matthew C. Fleenor, University of Mary Washington

10:15 PHASE INCOHERENT SUPERCONDUCTIVITY IN PSEUDOGAPPED CUPRATE SUPERCONDUCTORS REVEALED BY PARTICLE-HOLE SYMMETRIC JOINT DENSITY OF STATES
Niraj Shah, University of Virginia
Junjing Zhao, University of Virginia
Utpal Chatterjee, University of Virginia

10:30 Break

10:45 Sparks!
Al Tobias, University of Virginia

11:15 Invited: NANOGrav: Gravitational Waves (and other cool science) from Pulsar Timing
Scott Ransom, National Radio Astronomy Observatory

12:00 Business Meeting

03:00 The Velocity Triangle and the Accelerating Universe
Lewis McIntyre, Author

03:15 Resolving the Excess of Long GRB's at Low Redshift in the Swift Era
Truong Le, Roanoke College

03:30 Some Connections Between Music and Graph Theory
Brent Cody, Virginia Commonwealth University
Neal O. Bushaw, Virginia Commonwealth University
April Freeman, Virginia Commonwealth University
Tobias Whitaker, University of Richmond

03:45 The Independence Number of a Lie Algebra
Marco Aldi, Virginia Commonwealth University

POSTER PRESENTATIONS

Chemistry Atrium

1 **2-Slice Image Slicer**
Brooklyn McLaughlin, University of Virginia
John C. Wilson, University of Virginia

2 **Harmonic Analysis on Dani-Mainkar Nilmanifolds**
Logan Beach, VCU

3 **Large-Scale Outflow Dynamics Modeled as Momentum-Driven Shells**
Edmund Garcia, University of Mary Washington
Matthew C. Fleenor, University of Mary Washington

4 **Modeling SARS-CoV-2 Antibody Kinetics of Hybrid Events: an Analysis Across Demographic Groups**
Kaitlyn Sullivan, George Mason University
James O'Hanlon, George Mason University
Kelsey Ellis, George Mason University
Rayanne A. Luke, George Mason University
Glenda Canderan, University of Virginia
Lyndsey M. Muehling, University of Virginia

5 **Slow Spatial Migration Can Help Eradicate Cooperative Antimicrobial Resistance in Time-Varying Environments**
Kenneth Distefano, Virginia Tech
Lluís Hernández-Navarro, University of Leeds
Uwe C. Täuber, Virginia Tech
Mauro Mobilia, University of Leeds

6 **Stochastic Modeling of Gene Drives: Strategies for Mosquito Population Control with Male-Linked Genes**
Sara Shabani, Virginia Tech
Uwe C. Täuber, Virginia Tech
Zhijian Tu, Virginia Tech
Lauren M. Childs, Virginia Tech

7 **Studying Fluid Velocity Through Geometric Structures Using OpenFOAM**
Austin Moore, University of Mary Washington
Desmond Villaba, University of Mary Washington

8 **The Assembly and Testing of the Barrel Timing Layer for the CMS Experiment at the LHC**
Jack Shadel, University of Virginia
Chris Neu, University of Virginia
Lanie Barnett, Bryan Cardwell, Taylor Conner, Sydney Dixon, Christian Guinto-Brody, Maria Jose, Reshma Menon, Carter Patten, Zachary Rios, Zhenyu Wu., University of Virginia

9 **Toward a Voltage-Tunable Laser Frequency Lock Using Rydberg EIT Spectroscopy in a Rubidium Cell**
Kieran Wall, University of Virginia
Robert R. Jones, University of Virginia

10 **Probing the Great Pyramid of Khufu Using Cosmic Ray Muon Tomography**
Craig Dukes, University of Virginia

11 **Simulation of the CLAS12 Neutron Detection Efficiency**
Yuxuan Hu, University of Richmond
M. Xie, University of Richmond
Gerard P. Gilfoyle, University of Richmond
Brian A. Raue, Florida International University

12 **Visible-NIR Rebrightening in Stripped Envelope Supernovae Using Wide-Field Survey Data**
Altony Foote, University of Virginia
Craig Pellegrino, University of Virginia
Maryam Modjaz, University of Virginia

13 **Fitting a Polynomial to Data With Uncertainties in Domain and Range**
Joseph Rudmin, James Madison University

14 **Cytokine Response Modelling in Covid-19 Patients**
James O'Hanlon, George Mason University
Kaitlyn Sullivan, George Mason University
Kelsey Ellis, George Mason University
Rayanne A. Luke, George Mason University
Glenda Canderan, University of Virginia
Lyndsey M. Muehling, University of Virginia

BIOLOGY- MICROBIOLOGY & MOLECULAR BIOLOGY
(abstracts)

Section Officers:
Chair: Ginny Morriss, University of Mary Washington, Dept. of Biological Sciences
Vice Chair: Laura Sipe, 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

ORAL PRESENTATIONS

Biology I: Gilmer 390

09:30 **Welcome and Introductions**

09:45 [1] **SCP1 INFLUENCES PH ADAPTATION AND VIRULENCE IN CRYPTOCOCCUS NEOFORMANS.**
Carleigh J. Warsing, Liberty University
Hannah Finson, Liberty University
Ryker Heller, Liberty University College of Osteopathic Medicine
Rebekah A. Satalino, Liberty University College of Osteopathic Medicine
J. Andrew Alspaugh, Duke University School of Medicine
Michael S. Price, Liberty University College of Osteopathic Medicine & Duke University School of Medicine

10:00 [2] **CREATION OF SOP FOR BREEDING FOR THE FORMATION OF TRANSGENIC DANIO RERIO STRAIN VIA CRISPR CAS9 MEDIATED GFP TAGGING OF CD79A**
Adebayo Oluwakonyinsola, Liberty University
Broderick Adams, Liberty University
Mario Jose Palacios, Liberty University
Victoria M. Pacheco, Liberty University

10:15 [3] **GENOME-WIDE PHENOTYPIC CHARACTERIZATION OF MYCOBACTERIOPHAGE MERCURIO.**
Tyler Downs, Univ. of Mary Washington
Swati Agrawal, Univ. of Mary Washington

10:30 **Break**

10:45 [4] **CHAINED TOGETHER: HOMODIMERIZATION OF A SIGNALING PROTEIN IN C. DIFFICILE.**
Landon Rockwell, Virginia Wesleyan University
Caitlin Lee Williams, Virginia Wesleyan University

11:15 [5] **DEGRADATION OF VASCULAR NETWORKS IN CELL CULTURE MODEL OF MYOTONIC DYSTROPHY.**
Bonnie Butler, University of Mary Washington
Jessica Bronski, University of Mary Washington
Ginny R. Morriss, University of Mary Washington

11:30 [6] **CURCUMIN PROMOTES THE INHIBITION OF IRS-1 S1101 PHOSPHORYLATION WHILE RESTORING INSULIN SIGNALING AND PHOSPHORYLATION OF PRAS 40 AND RPS6.**
Davis M. Raz, Liberty University
John C. Zelenka, Liberty University
Rachael K. De Clerk, Liberty University
Vhuthuhawe Madzinge-Thomas, Liberty University

12:00 [7] **Combined Business Meeting in Gilmer 390**

Biology II: Gilmer 247

09:30 **Welcome and Introductions**

09:45 [7] **SPATIOTEMPORAL CHARACTERIZATION OF P53 EXPRESSION DURING OPTIC NERVE REGENERATION IN XENOPUS LAEVIS.**
Abigail S. Moore, Washington & Lee University
Fiona Watson, Washington & Lee University

10:00 [8] **INFLUENCE OF PRM1 ON CRYPTOCOCCUS NEOFORMANS VIRULENCE.**
Cate H. Plaisance, Liberty University

10:15 [9] **ABNORMALLY HIGH PREVALENCE OF SCIATIC NERVE HIGH DIVISION: POTENTIAL CAUSES AND CLINICAL CONSIDERATIONS**
Caleb Smith, Liberty University

10:30 **Break**

10:45 [10] **CARBON AND NITROGEN INFLUENCE ON ENZYME PRODUCTION IN BATRACHOCHYTRIUM DENDROBATIDIS.**
Taylor R. Pulley, Longwood University
Amanda M. Starr, Longwood University

11:15 [11] **INVESTIGATING SOYBEAN TRYPSIN INHIBITORS AND SOYBEAN LECTIN MOLECULAR INTERACTIONS TO MITIGATE THEIR ANTINUTRITIONAL EFFECTS IN ANIMAL FEED.**
Ayoyinka O. Okedigba, Virginia Tech
M. Luciana Rosso, Virginia Tech
William Ngo, Virginia Tech
Ruoshi Xiao, Virginia Tech
Daisy Yu, Virginia Tech
Chao Shang, Virginia Tech
Haibo Huang, Virginia Tech
Bo Zhang, Virginia Tech
Daniel G. S. Capelluto, Virginia Tech.

11:30 [12] **BACTERIAL INFLUENCE ON FROG FUNGUS.**
Amanda N. Doty, Longwood University
Amanda M. Starr, Longwood University

12:00 **Combined Business Meeting in Gilmer 390**

Posters

15 **A COMPARISON OF THE DIVERSITY AND DENSITY AMONG FRUIT FLY POPULATIONS IN CARTER'S MOUNTAIN AND CHILE'S ORCHARDS IN THE SUN AND SHADE.**
Zohair M. Boz Al Asaal, Piedmont Virginia Community College

16 **CURCUMIN PROMOTES THE INHIBITION OF IRS-1 S1101 PHOSPHORYLATION WHILE RESTORING INSULIN SIGNALING AND PHOSPHORYLATION OF PRAS 40 AND RPS6.**
Davis M. Raz, Liberty University
John C. Zelenk, Liberty University
Rachael K. De Clerk, Liberty University
Vhuthuhawe Madzinge-Thomas, Liberty University

17 **DISCOVERING GENE FUNCTION IN PHAGE ZAPNER.**
Lucca Muta, Univ. of Mary Washington
Emily P. Wills, Univ. of Mary Washington
Theresa Grana, Univ. of Mary Washington

18 **SEROTONIN AND DOPAMINE INTERACTIONS IN FUMIN FLY VARIANTS.**
Simi Chakravarty, University of Virginia

19 **POWER ANALYSIS FOR EFFECT OF EXERCISE TRAINING IN A DROSOPHILA MODEL OF MYOTONIC DYSTROPHY.**
Delaney G. Humphrey, University of Mary Washington
Carleigh Wood, University of Mary Washington
Ginny R. Morriss, University of Mary Washington

20 **THE IMPACT OF NOREPINEPHRINE EXPOSURE ON MICROGLIA IL-1B PRODUCTION**
Mikyas Telahun, University. Mary Washington
Meah Katz, University. Mary Washington
Kristy Bagley, University. Mary Washington
Deborah O'Dell, University. Mary Washington

21 **ESTABLISHING AND CHARACTERIZING IN VITRO CO-CULTURE SYSTEMS FOR HUMAN SECONDARY ACUTE MYELOID LEUKEMIA STUDIES.**
Leah Friedman, James Madison University
Jaira Ferreira de Vasconcellos, James Madison University

22 **EXAMINATION OF NATIVE SAS3 IN C. NEOFORMANS VIA CO-IMMUNOPRECIPITATION.**
Ethan M. Carlile, Liberty University
Kayla S. Riggleman, Liberty University
Joseph C. Whaley, Liberty University
Gary D. Isaacs, Liberty University

23 **ACUTE TYPE 1 DIABETES ADVERSELY IMPACTS AFFECTIVE DIFFERENCES, COGNITIVE PERFORMANCE, AND NEUROGENESIS IN MALE AND FEMALE MICE.**
Maximiliano Pino, Liberty University

24 **MICROBIAL RESISTANCE IN LIVESTOCK COMMUNITIES.**
Gabrielle P. Quaresma, Longwood University
Scott M. Starr, Hampden-Sydney College
Amanda M. Starr, Longwood University

25 **MECHANISTIC INSIGHTS, THERAPEUTIC POTENTIAL, AND SYNERGISTIC STRATEGIES OF 24-METHYL CHOLESTEROL AS A MODULATOR OF GLUCOSE METABOLISM IN CLEAR CELL RENAL CELL CARCINOMA CELLS.**
Merritt L. Smith, Liberty University
Josiah Chung, Liberty University
Esti Dautaj, Liberty University
Faith Ekoh, Liberty University
Otchere Donkor, Liberty University
William Moore. Liberty University

26 **MOLECULAR MECHANISMS OF PHAFIN2 INTERACTIONS IN MACROPINOCYTOSIS.**
Marija Corluka, Virginia Polytechnic Institute and State University
Mahmudul Hasan, Virginia Polytechnic Institute and State University
Tuoxian Tang, Virginia Polytechnic Institute and State University
Daniel G. S. Capelluto, Virginia Polytechnic Institute and State University

27 **Screening of small interfering RNAs for the investigation of post-traumatic fibrosis.**
Amy Acosta Cruz, James Madison University
Nicole L. Cubbage, James Madison University
Jasmin Palmer, James Madison University
Emma Melton, James Madison University
Leah Friedman, James Madison University
Chloe Matz, James Madison University
Jaira Ferreira de Vasconcellos, James Madison University

28 **THE EFFECTS OF MYOGLIANIN KNOCKDOWN ON DROSOPHILA MELANOGASTER WITH MYOTONIC DYSTROPHY TYPE ONE.**
Eleni J. Kepler, Univ. of Mary Washington
Ginny R. Morriss, Univ. of Mary Washington

29 **TOM1 G307D VARIANT ALTERS INTERACTION WITH TOLLIP IMPAIRING AUTOPHAGOSOME-LYSOSOME FUSION AND REGULATION OF INNATE IMMUNITY.**
Megan V. Collins, Virginia Tech
Heljä Lång, University of Helsinki, Helsinki University Hospital
Tiffany G. Roach, Virginia Tech
Maarit Hölttä, University of Helsinki
Kaarina Heiskanen, University of Helsinki, Helsinki University Hospital
Mikko R.J. Seppänen, University of Helsinki, Helsinki University Hospital
Daniel G. S. Capelluto, Virginia Tech
Elina Ikonen, University of Helsinki
Samppa J. Ryhänen, University of Helsinki

30 **ZEBRAFISH (DANIO RERIO) VISUALLY DETECT CONSPECIFIC REACTIONS TO DIFFERENT DOSES OF THE SYNTHETIC ALARM SUBSTANCE, HYPOXANTHINE-3 N-OXIDE (C5H4N4O2)**
Rommel Pagkalinawan, Christopher Newport University
Jack Medlin, Christopher Newport University
Ethan Hoffman, Christopher Newport University
Kaitlyn Kinslow, Christopher Newport University
Jamie Martin, Christopher Newport University
Haley Dewitt, Christopher Newport University
Sara Chaari, Christopher Newport University
Joy Kanapala, Christopher Newport University
Grady Fleming, Christopher Newport University
Ellie Barry, Christopher Newport University
Andrew Velkey, Christopher Newport University

31 **IDENTIFYING THE BINDING SITE SEQUENCE OF PROTEIN CDR20291_1748 IN C. DIFFICILE.**
Audrey J Roberts, Virginia Wesleyan University
Caitlin Lee Williams, Virginia Wesleyan University

32 **DETERMINING THE ROLE OF MAN4, MAN5 AND MAN6 PROTEINS IN CRYSTAL MORPHOLOGY IN MAGETOSPIRILLUM GRYPHISWALDENSE MSR-1.**
Jackson Geesling, Longwood University
Jackson LoFiego, Longwood University
Denis Trubitsyn, Longwood University

33 **ABUNDANCE AND VARIETY OF CLADOCERAN.**
Edison Tennant, Piedmont Virginia Community College

34 **Abnormally High Prevalence of Sciatic Nerve High Division: Potential Causes and Clinical Considerations**
Caleb Smith, Liberty University

35 **CREATION OF SOP FOR BREEDING FOR THE FORMATION OF TRANSGENIC DANIO RERIO STRAIN VIA CRISPR CAS9 MEDIATED GFP TAGGING OF CD79A**
Adebayo Oluwakonyinsola, Liberty University
Broderick Adams, Liberty University
Mario Jose Palacios, Liberty University
Victoria M. Pacheco, Liberty University

36 **Influence of the GLP-1 System on the Positive Cognitive Effects of Environmental Enrichment**
Christopher Anderson, University of Mary Washington
Lexi Miller, University of Mary Washington
Parrish Waters, University of Mary Washington

37 **UNDOCUMENTED BASILIC VEIN VARIATIONS IN CADAVERIC DONORS: A CASE STUDY**
Lausyn Johnson, Liberty University
Marika Yelle, Liberty University

38 **OBSERVING TAU FIBRIL INTERACTIONS WITH HSPG 3-O AND HSPG 6-O**
Gracie Fugleberg, University of Mary Washington
Samantha Mitzel, University of Mary Washington
Deborah O'Dell, University of Mary Washington

39 **GENOME-WIDE PHENOTYPIC CHARACTERIZATION OF MYCOBACTERIOPHAGE MERCURIO.**
Tyler Downs, Univ. of Mary Washington
Swati Agrawal, Univ. of Mary Washington.

BIOMEDICAL & GENERAL ENGINEERING (abstracts)

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

Chemistry 306

10:00 **Abnormal Flexor Synergy Assessment using a Robotic Exoskeleton**
Shawn DiRocco, Virginia Commonwealth University
Peter Lum, The Catholic University of America

10:15 **Recognition and Mitigation of Stimulation Artifacts in Rodent TMS Experiments**
George Weistroffer, Richmond Veterans Affairs Medical Center
Mark Baron, Richmond Veterans Affairs Medical Center

10:30 **Effect of magnetic field strength and segmentation variability on the reproducibility and repeatability of radiomic texture features in cardiovascular magnetic resonance parametric mapping**
Pascal Yamlome, Virginia Commonwealth University
Jennifer Jordan, Virginia Commonwealth University

10:45 **Sleep and Parkinson's: A Novel Computational Approach to Predict the Incidence of Parkinson's Disease**
Aditi Nair, Maggie L. Governor School
Dean Krusienski, Virginia Commonwealth University

11:15 **Reconstruction of rodent brain using histological analysis and in vitro recording**
Lydia Galvin, Richmond Veterans Affairs Medical Center
Mark Baron, Richmond Veterans Affairs Medical Center
George Weistroffer, Richmond Veterans Affairs Medical Center

11:30 **Optimal Interception Strategies for Enhanced Target Protection: An Assignment Selection Model**
Emmanuel des-Bordes, Blue Ridge Community College

11:45 **Business Meeting**

POSTER PRESENTATIONS

Chemistry Atrium

40 **Sleep and Parkinson's: A Novel Computational Approach to Predict the Incidence of Parkinson's Disease**
Aditi Nair, Maggie L. Governor School
Dean Krusienski, Virginia Commonwealth University

41 **Where do you feel the burn? Exploring a novel vibrotactile feedback method inspired by physical therapy practice**
Julia Larson, James Madison University

BOTANY (abstracts)

Section Officers:
Chair: vacant
Vice Chair: Robert Wright, Wetland Studies and Solution, Inc.
Secretary: W. John Hayden, University of Richmond
Editor: vacant
Councilor: Conley McMullen, James Madison University

ORAL PRESENTATIONS

Physics 218

9:45 **Welcome and opening remarks**

10:00 **History of the 1926 founding of the Virginia Flora Committee**
Marion Lobstein, Northern Virginia Community College

10:15 **Disease cycle of Mayapple Rust, Allodus podophylli**
W. John Hayden, University of Richmond

10:30 Invited: **Virginia Wildfires and Prescribed Burning – Could the recent California wildfires occur in the Commonwealth?**
John Miller, Virginia Department of Forestry

11:30 **Botany Section Business Meeting**

POSTER PRESENTATIONS

Chemistry Atrium

42 **Do Buried Logs Affect Soil Calcium Concentrations in Forested Peatlands?**
Mitchell Bundick, Christopher Newport University
Robert Atkinson, Christopher Newport University
Janet Steven, Christopher Newport University

43 **Flora of Candler's Mountain: Documenting Natural Communities and Establishing an Herbarium**
Jill Crunkilton, Liberty University
Hannah King, Christian Gilbert, Jenna Morris, Jordan Whitt, Elizabeth Williams, Lydia Harris, Olivia Grimsley, Kala Matuszak, Oliver Thomas, and Kyle Harris, Liberty University

44 **Seasonal Variation of Epilithic Algae in a Small Urban Stream**
Nicholas T. Lewis, George Mason University
Hannah Toney, George Mason University
Rosalina Christova, George Mason University
R. Christian Jones, Potomac Environmental Research and Education Center

45 **Annotating previously uncatalogued pteridophyte specimens from the Galápagos Islands**
Brooke Thomson, James Madison University
Conley K. McMullen, James Madison University

46 **Mycological Survey of the Edith J. Carrier Arboretum**
Carrie Chambers, James Madison University
Conley K. McMullen, James Madison University

47 **Seasonal variation in epilithic periphyton biomass at a site in North Fork Shenandoah River, Virginia**
Kennedy Watson, George Mason University
Teagan Corpening, George Mason University
Melanie Hutchinson, George Mason University
R. Christian Jones, George Mason University

48 **From herbarium to crime scene: assessing SEM and LM for pollen identification**
Madison Smith, Longwood University
Bjoern Ludwar, Longwood University
Mary Lehman, Longwood University

CHEMISTRY (abstracts)

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

Chemistry 217

09:00 **Binding Energies of Methyl Formate in Astrophysical Ices via Thermal Desorption.**
Rachel Gross, University of Virginia

09:15 **Ultrafast Dissociation of Hexane Isomers Measured by Femtosecond Time of Flight Mass Spectrometry**
Timothy Gene Hill, Virginia Commonwealth Univ
Madison K. Minvielle, Virginia Commonwealth Univ
Mikaela Aftel, Virginia Commonwealth Univ
Hugo A. Lopez-Peña, Virginia Commonwealth Univ
Katharine Moore Tibbetts, Virginia Commonwealth Univ

09:30 **Degradation of Engineering Plastics Containing Polystyrene for Benzene Recovery**
Yue Zhang, Virginia Tech

09:45 **QuEChERS Extraction of Polychlorinated Biphenyl (PCBs) in Sediment from the New River.**
Sierra Garrison, Radford University

10:00 **Efforts Toward the Total Synthesis of Unprecedented Monoterpenoid Quinoline Alkaloid Natural Products**
Shayne Weierbach, Old Dominion University
Kyle M. Lambert, Old Dominion University

10:15 **New Cobalt-Catalyzed Strategies for Carbonyl Additions**
Kyle M. Lambert, Old Dominion University
Cylah A. Bruno, Old Dominion University
Shayne Weierbach, Old Dominion University
Jean M. Bray, Old Dominion University
Karen Vargas, Old Dominion University
Olivia Brown, Old Dominion University

10:30 **Break**

10:45 **Ketone Allylation and Prenylations Utilizing a Bench Stable Co[III] Complex Catalyst.**
Olivia Brown, Old Dominion University
Kyle M. Lambert, Old Dominion University

11:00 **Microwave-Assisted Synthesis of Metallic Nanoparticles in Aqueous Solution**
Peter Njoki, Hampton University
Emira Wideman, Hampton University

11:15 **Understanding Cation-Anion Ionic Bonding in Tetramethylammonium Salts: Insights from Density Functional Theory and X-ray Crystallography**
Chris Hollinsed, James Madison University
Abigail Taber, James Madison University
Mahdy Al Anbari, James Madison University

11:30 **A Comparative Study of Substituent Effects on the Nonlinear Optical Properties of Simple Azobenzene and Stilbene Derivatives**
Edmund Moses N. Ndip, Hampton University
Amir Johnson, Hampton University

11:45 **Spectroscopy of ions in solution**
Tom DeVore, James Madison University
Kayla Winget, James Madison University
Patrick Randolph, James Madison University
Jonathan Brubaker, James Madison University

12:00 **Business Meeting**

POSTER PRESENTATIONS

Chemistry Atrium

49 **THEORETICAL THERMOCHEMICAL ESTIMATIONS OF SEROTONIN FORMATION IN NEUROBIOLOGICAL PATHWAYS**
Angelina Thotam, Hampton University
Aniyah Barnett, Hampton University
McKenzie McNeill, Hampton University
Emmani Shaw, Hampton University
Ivana Thigpen, Hampton University
Michelle Waddell, Hampton University
Insu F. Hahn, Hampton University

50 **QUANTUM CHEMICAL CALCULATIONS FOR STRUCTURAL GEOMETRIES AND BONDING THERMODYNAMICS OF HISTAMINE AND TARGETED CATECHOLAMINES**
Jewel Harper, Hampton University
Morgan Bernard, Hampton University
Insu F. Hahn, Hampton University

51 **APPLICATIONS OF TIRE-DERIVED POLLUTANTS IN FORENSICS.**
Aiden Adkins, Old Dominion University
Kyle Lambert, Old Dominion University
Avery Johnson, Old Dominion University
Jacinda Pastoriza, Old Dominion University
Kayla Shipman, Old Dominion University
Sarah Chapin, Old Dominion University
Taylor Corprew, Old Dominion University

52 **IN SITU KINETICS MONITORING TOWARD ELUCIDATING MECHANISTIC ASPECTS OF THE MECHANOCHEMICAL SYNTHESIS OF ZINC IMIDAZOLATES**
Hamna Hafeez, Old Dominion University
Jeremy Schwingel, Old Dominion University

53 **DESIGN OF A GAS CELL APPARATUS FOR MEASURING EFFUSION RATES OF GASES**
Jamie Sims, University of Lynchburg

54 **Using GC/MS TO DETERMINE CADAVERINE AND PUTRESCINE CONCENTRATION IN PORCINE LIVER FOR PMI ESTIMATION**
Lydia Buxa, Liberty University
Todd Allen, Liberty University

55 **EXAMINING THE DEVELOPMENT AND UTILIZATION OF BIOACTIVE NATURAL PRODUCTS.**
Gloria R. Marshall, Old Dominion University
Sara T. Radwan, Old Dominion University
Karen Vargas, Old Dominion University
Kyle M. Lambert, Old Dominion University

56 **ANALYSIS OF INHIBITOR BINDING TO BACTERIAL BETA GLUCURONIDASE.**
Jacob Flora, Radford University
Kimberly Lane, Radford University

57 **TOWARDS A QUANTITATIVE MODEL OF YscQ-REGULATED TYPE III SECRETION IN Yersinia Enterocolitica**
Gopika Lekshmi, University of Virginia
Olivia I. C. de Cuba, University of Virginia
Andreas Gahlmann, University of Virginia

58 **COMPUTATIONAL CHEMISTRY INQUIRY INTO THE MOLECULAR CHEMISTRY OF ATMOSPHERIC BROWN CARBON AEROSOLS**
Thabiso Kunene, Hampton University

ENTOMOLOGY (abstracts)

Section Officers:
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

Ridley Hall Room 139

10:00 Welcome and Introductions

10:15 Habitat Preference of Ambrosia Beetles (Curculionidae) Using Bottle Traps in Southeastern Virginia
Sajrim Chowdhury, Old Dominion University

10:30 Using Spices to Mitigate the Detrimental Effects of the Red Imported Fire Ant Solenopsis Invicta Buren (Formicidae) in Virginia
Karson McHendry, Old Dominion University

10:45 The Role of Culex Rerritans, the Northern Frog-Biting Mosquito, in Transmitting Ranaviruses to its Amphibian Hosts
Joanna Reinhold, Longwood University

11:00 Invasive Redbay Ambrosia Beetle (Xyleborus glabratus) in Southeastern Virginia: A Growing Threat to Forests and Management Strategies.
Umme Habiba Akter, Old Dominion University

11:15 Ticked-Off: Determining the presence, abundance, and habitat-use of potentially pathogen-carrying ticks at publicly-accessible urban sites in Lynchburg, VA
Dr. Erin Heller, Randolph College

11:30 Shameless Plugs: Recruiting a student? Starting a citizen science project? Looking for a postdoc? Need volunteers? Share your shameless plugs!

12:00 Business Meeting

POSTER PRESENTATIONS

Chemistry Atrium

59 Diet Analysis of Harvestmen in Southeastern Virginia Using Stable Nitrogen Isotopes
Maynard Schaus, Virginia Wesleyan University

ENVIRONMENTAL AND CONSERVATION (abstracts)

Section Officers:
Chair: James Haluska, Retired Oceanographer
Vice Chair: Katherine O'Neill, Roanoke College, Dept. of Environmental Studies
Secretary: Chelsea Peters, Roanoke College, Dept. of Environmental Studies
Editor: Vacant
Councilor: William Kissner, Environmental Science Teacher, Dinwiddie County High School

ORAL PRESENTATIONS

Ridley Hall Room 137

11:00 **Black Vulture Behavior in Central Virginia**
Dr. Richard Groover, George Mason University

11:30 **Reading Between the Lines: Understanding How Two Anthropogenic Threats Affect Seasonal Growth in Atlantic White Cedar (Chamaecyparis thyoides L. (B.S.P.))**
Jordan Williams, Christopher Newport University
Robert B. Atkinson, Christopher Newport University

12:00 **Business Meeting**

POSTER PRESENTATIONS

Chemistry Atrium

60 **Development of Environmental DNA Tool kit for Fresh Mussels**
Nicholas Duellman, Longwood University
Jameson E. Hinkle, Longwood University

61 **Ecological analysis as a context for skill-building in data exploration, prediction, and inferential statistics**
Ananshia Ananth Seenivasan, James Madison University
Ehren Moler, James Madison University
Amy Whipple, Northern Arizona University
Kristen Waring, Northern Arizona University

62 **Fear to Hope and the Ragged Island Salt Marsh Restoration Project: Engaging High School Students in Marine Debris Research**
Charlotte Fowler, Christopher Newport University
Robert B. Atkinson, Christopher Newport University
Jordan Williams, Christopher Newport University

63 **Simulating Spatially Explicit Barrier Removal and its Demogenetic Effect on a Threatened Char in that Context of a Reintroduction.**
Hannah Newton, Longwood University
Jameson E. Hinkle, Longwood University

64 **Avian Richness and Relative Abundance in an Urban vs Rural Park**
Theo Staengl, Piedmont Virginia Community College
Marlina Yost, Piedmont Virginia Community College

65 **Environmental Determinants of Asthma Severity: Examining the Link Between NO2 and Hospitalization Rates**
Zahra Rizvi, College of William and Mary

66 **Seasonal Variation in Epilithic Periphyton Biomass at a Site in North Fork Shenandoah River, Virginia**
Kennedy Watson, George Mason University
Teagan Corpening, George Mason University
Melanie Hutchinson, George Mason University
R. Christian Jones, George Mason University

67 **Engaging High School Students in Meaningful Climate Change Research: Perspectives from the 4th Fear to Hope Manager**
Jordan Williams, Christopher Newport University
Robert B. Atkinson, Christopher Newport University

Geology (abstracts)

Section Officers:
Chair: Parvinder Sethi (interim), Radford University
Vice Chair: vacant
Secretary: vacant
Editor: vacant
Councilor: Parvinder Sethi (interim), Radford University

ORAL PRESENTATIONS

Physics 217

09:15 **Welcome from the Chair**

09:30 **Near-shore Biogeochemical Processes Impacting Deposition of the Millboro black Shale in the Middle Devonian, Appalachian Basin, U.S.A.**
Parvinder Sethi, Radford University

09:45 **Investigating the Impacts of Watershed Urbanization on Sediment Dynamics and Geomorphology of a River: Preliminary Results**
Afrida Aranya, Virginia Tech
Julia Cisnero, Virginia Tech

10:00 **Quantifying Bedform Morphology in Meandering Rivers**
Daniel Alvarez, Virginia Tech
Julia Cisneros, Virginia Tech

10:15 **NASA-gigapan-based Virtual Field Trips for Teaching Physical Geology: Engaging Today's Non-STEM Freshman Majors in General Education Classes**
Parvinder Sethi, Radford University
Reed Wicander, Central Michigan University and The University of Queensland, Australia

10:30 **Break**

10:45 **Application of LiDAR for Surveying Geological Structures in Black Shales: Case Study of the Millboro Shale in Southwestern Virginia**
Parvinder Sethi, Radford University
Andrew S. Foy, Radford University
Bode H. Lindauer, Radford University

11:00 **What is the Spatial Distribution of Coronae on Venus Telling Us?**
Grant Euen, Radford University and Virginia Tech
Scott D. King, Virginia Tech

11:15 **Linking Morphodynamics of Superimposed Dunes Across Environments**
Elpidio Guzman De La Cruz, Virginia Tech
Julia Cisneros, Virginia Tech

11:30 **Using HRNet and MMSegmentaion with ESRI Deep Learning Tools to Identify and Map Talus Slopes in Shenandoah National Park**
Andrew Foy, Radford University
Parvinder Sethi, Radford University
Nicholas J. Kalen, Virginia Tech

11:30 **Business Meeting**

POSTER PRESENTATIONS

Chemistry Atrium

68 **Influence of microbial mats on the sedimentary dynamics and stratigraphy of Aaron Formation, South Fork of Little River, Durham County, North Carolina**
Victor Akudoro, Old Dominion University
Nora Noffke, Old Dominion University
Caldwell Buntin, Old Dominion University

69 **Geologic applications of the "PIX4DMapper™" software for generating 3-D models of sedimentary facies from West Virginia and Virginia.**
Bode Lindauer, Radford University
Parvinder Sethi, Radford University
Ryan Sincavage, Radford University
Alex Gray, United States Geological Survey, Reston, VA

70 **Rock Varnish on a Sandstone Rock Shelter in the Ashland Quadrangle, Virginia**
Amy Edwards, Hanover County Government

Materials Science (abstracts)

Section Officers:
Chair: Timothy Montoy (interim), University of Virginia
Vice Chair:
Secretary: David L. Green, University of Virginia, Dept. of Materials Sciences & Engineering
Editor: Costel Constantin, James Madison University, Dept. of Physics & Astronomy
Councilor: Timothy Montoy (interim), University of Virginia

ORAL PRESENTATIONS

Physics 220

09:00 **Invited: That "junk" might have value: Atomic-scale insights into imperfections in materials**
Kory Burns, University of Virginia

09:30 **Studies of the mechanisms of mechanochemical reactions**
Silvina Pagola, Old Dominion University
Maria Dolores Masso, Old Dominion University
Jeremy Schwingel, Old Dominion University
Hamna Hafeez, Old Dominion University

09:50 **Laser synthesis of nanomaterials in liquid: a sustainable route to catalysts for energy conversion applications**
Katharine Moore Tibbetts, Virginia Commonwealth University

10:10 **Photochemical oxygen defect generation in TiO2 by femtosecond pulsed laser**
Emily Anne Jackson, Virginia Commonwealth University
Chamari Weththasingha, Virginia Commonwealth University
Katharine Moore Tibbetts, Virginia Commonwealth University

10:30 **Break**

10:50 **Bicontinuous Invar-Ag microcomposites formed by Ag dendritic/cellular infiltration of pre-cast or pre-additively manufactued Invar-Cu**
Haobo Wang, University of Virginia
Prosenjit Biswas, University of Virginia
Ji Ma, University of Virginia
Jerrold Floro, University of Virginia

11:10 **Efficacy of laser surface treatment on corrosion-induced fatigue of AA5456 in humid air environments**
Rajaguru Jeyamohan, University of Virginia
Mohammed Shabana, University of Virginia
John Scully, University of Virginia
Ji Ma, University of Virginia
James Burns, University of Virginia

11:30 **Computational modeling of the structure and stability of Guinier-Preston (GP) zones in Mg alloys**
Yuanchen Gao, University of Virginia
Bi-Cheng Zhou, University of Virginia

11:50 **Illuminating microstructural effects on electron-phonon coupling in monolayer MoS2**
Elaina Truhart, University of Virginia
Jordan Hachtel, Oak Ridge National Laboratory
Benjamin Lawrie, Oak Ridge National Laboratory
Kory Burns, University of Virginia

12:10 **Business Meeting**

POSTER PRESENTATIONS

Chemistry Atrium

71 **Optical characterization of potential TPV emitter materials using ellipsometry**
Po Huang, University of Richmond
Mariama R. S. Dias, University of Richmond

72 **Analysis of bennu particle surfaces by x-ray photoelectron spectroscopy**
Lianis V Reyes-Rosa, University of Virginia
C. Dukes, University of Virginia
A. Woodson, University of Virginia
J. Glass, University of Virginia
A. Li, University of Virginia

73 **Vibrational spectroscopy and nanodiffraction of multi-phase boron nitride thin films**
Nooreen Qureshi, University of Virginia
Kory Burns, University of Virginia

74 **Biomechanical investigation of macrophages interacting with micro- and nono-plastics (MSPS) using atomic force micrscopy (AFM)**
Paul Ucheaga, Virginia Commonwealth University
Massimiliano Galluzzi, Chinese Academy of Science

75 **Composition tunable energy gaps, optical and structural studies of colloidal Ge1-x-ySiySnx alloy quantum dots**
Chineme J Onukwughara, Virginia Commonwealth University
Indika U. Arachchige, Virginia Commonwealth University

76 **Illuminating microstructural effects on electron-phonon coupling in monolayer MoS2**
Elaina Truhart, University of Virginia
Jordan Hachtel, Oak Ridge National Laboratory
Benjamin Lawrie, Oak Ridge National Laboratory
Kory Burns, University of Virginia

77 **Studies of the mechanimss of mechanochemical reactions**
Silvina Pagola, Old Dominion University
Maria Dolores Masso, Old Dominion University
Jeremy Schwingel, Old Dominion University
Hamna Hafeez, Old Dominion University

78 **In situ kinetics monitoring toward elucidating mechanistic aspects of the mechanochemical synthesis of zinc imidazolates**
Hamna Hafeez,

79 **Neutral and ionic tetrathiafulvalene chloranilic acid polymorphs: Mechanochemical reaction kinetics dependence on the ball milling frequency**
Alastair Deans, Old Dominion University
Silvina Pagola, Old Dominion University

80 **Electromagnetic interference shielding materials derived from polymeric materials**
Aba Anokye, Hampton University

PSYCHOLOGY (abstracts)

Section Officers:
Chair: Sage Hawn, Old Dominion University
Vice Chair: Samuel West, Virginia State University, Dept. of Psychology
Secretary: Abby Braitman, Old Dominion University, Dept. of Psychology
Editor: Ivan Ash, Old Dominion University, Dept. of Psychology
Councilor: Vacant

ORAL PRESENTATIONS

Gilmer 245

11:15 **Comparing Measures Of Emotional States: Self-Reports vs. Sentiment Analysis**
Amaya Woods, Virginia State University
Samuel J. West, Virginia State University
Davis S. Chester, Virginia State University

11:30 **Comparing the Effects of High vs. Low Arousal Emotions on the Urge to Use THC**
Faith McLaurin, Virginia State University
Samuel J. West, Virginia State University

11:45 **Coping with Trauma and Its Cost: The Impact of Trauma-Related Behaviors on Quality of Life and the Buffering Role of Resilience**
Lauren Leggett Smith, Old Dominion University
Christopher Latourrette, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

12:00 **Business Meeting: officers and other business**

POSTER PRESENTATIONS

Chemistry Atrium

81 **The Cost of Coping: How Trauma-Linked Behaviors Relate to Mental and Physical Health**
Lauren Leggett Smith, Old Dominion University
Christopher Latourrette, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

82 **High Resilience, Healthier Coping? A Moderation Analysis of PTSD and Coping behaviors in College Students**
Daniela Chaname, Old Dominion University
Christopher Latourrette, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

83 **Differences in Social Support Following Sexual Assault in Sexual Minority Individuals versus Non-Sexual Minorities**
Christopher Blackmon, Old Dominion University
Taylor Kliebhan, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

84 **Investigating the Indirect Effects of PTSD on General Health Through Disordered Eating Behaviors**
Taylor Kliebhan, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

85 **Neurodevelopmental Biomarkers and Lived Experiences: Understanding Late Autism Diagnosis Across Gender and Sex**
Sarah Zeffouni, University of Virginia

86 **Resilience as a Latent Predictor in the Structural Equation Model Depicting the Comorbidity Between PTSD and Depression**
Selah Ball, Old Dominion University
Taylor Kliebhan, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

87 **Shame and PTSD: Investigating a Mediational Pathway from Interpersonal Trauma Exposure**
Anita Thomas, Old Dominion University
Taylor Kliebhan, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

88 **The Effects of Sexual Orientation Stereotypes on False Memory and Social Categorization Judgments**
Julia Strickland, Old Dominion University
Ivan K. Ash, Old Dominion University
Nahielys Ortega Jimenez, Old Dominion University

89 **Trauma-Related Eating to Cope and Health Outcomes: A Mediation Model**
Kaytlin Armitage, Old Dominion University
Christopher Latourrette, Old Dominion University
Niya Richardson, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

90 **When Fish Flounder: A Zebrafish Model for Choice Paralysis Using a Discrete Choice Instrumental Response Task**
Markham Puhlick, Makenna Scaia, Leo Brennan, Robby Buck, Drew Durante, Maggy Dwyer, Rachel Glather, Liz Hiltz, Julie Krebs, Annabelle Porner, Alexis Thai-Nguyen, Zoey Thayer, Kailynn Landry, Micaela Flores-Vaccari, Andrew Velkey, Christopher Newport University

91 **The Influence of Exposure Type and Resilience on Cannabis Use to Cope**
Max Ragland, Old Dominion University
Taylor Khliebhan, Old Dominion University
Kaytlin M. Armitage, Old Dominion University
Christopher Latourrette, Old Dominion University
Sage Hawn, Old Dominion University, Virginia Consortium Program in Clinical Psychology

92 **The Science of Music: Folk and Blues Music Tuned at 432 Hz Positively Impacts the "Alpha State of Mind"**
Jett Yaborough, Liberty University
Nathania Torres, Liberty University
Manya Neerotikudiyil, Liberty University
Nancy Vasquez, Liberty University

STRUCTURAL BIOLOGY, BIOCHEMISTRY & BIOPHYSICS

(abstracts)

Section Officers:
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: Randall Reif, University of Mary Washington, Dept. of Chemistry

ORAL PRESENTATIONS

Chemistry 206

09:30 Welcome and Introductions

09:45 Probing membrane nanoenvironments: experimental validation of modular HaloTag technology in model membranes and live cells
Grant Baker, University of Virginia

10:00 Elucidating the molecular mechanism through which obscurin alters cellular migration
Kamrin Shultz, James Madison University

10:15 Investigating Bound Times of Protein Subcomplexes in Y. enterocolitica
Adair Poyer, University of Virginia

10:30 Break

10:45 Mutational Analysis of the Bacterial Loop in E. coli β-glucuronidase
Elmer Ashton Ennis V, Radford University

11:00 Mesolimbic Dysregulation in Fentanyl-Withdrawn Rats
Greatness Olaitan, University of Virginia

11:15 Mitochondrial Modulation in Cancer Cells
Mengistu L. Shukare, Hampton University

11:30 Unraveling Mitochondrial Exchange: Intercellular Transfer Between SW1353 Chondrosarcoma and Wild-Type Cells
Caleb Wyckoff, Old Dominion

11:45 Break

11:50 Invited: Cancer Cell Death by Proton Pump Inhibitors
Randy Reif, University of Mary Washington

POSTER PRESENTATIONS

Chemistry Atrium

93 Characterizing small molecule/Desmoplakin¬†interactions that prevent protein degradation
Juana Al Anbari, James Madison University

94 Measuring Cellular Mechanics via Image Analysis Techniques to Uncover a Molecular Pathway Involving Obscurin
Yasmin Faris Salih Al Anbari, James Madison University

95 Biomechanical Investigation of Macrophages Interacting with Micro- and Nano-Plastics (MNPs) Using Atomic Force Microscopy (AFM)
Uchenna Paul Ucheaga , Virginia Commonwealth University

96 Biochemical characterization and discovery of inhibitors for Pf Sir2A: new tricks for an old enzyme
Dickson Donu, Virginia Commonwealth University

97 DNA Fiber Assay Reveals RBN-2397 (PARP7 Inhibitor) Induces Distinct Replication Phenotypes Compared to PARP1 Inhibitor
Rosea Chen, University of Virginia

98 Regulation of the ALT Pathway by Ubiquitination of PCNA
Alexandra Wang, University of Virginia

99 Growth Effects of Proton Pump Inhibitors on Jurkat T Lymphocytes
Caroline Sampson, University of Mary Washington

100 Investigating Bound Times of Protein Subcomplexes in Y. enterocolitica
Adair Poyer, University of Virginia

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.htm.

For additional information, contact VAS Executive Officer.

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

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

or email to vasoffice@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, vasoffice@vacadsci.org.

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

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

or email to vasoffice@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 fifth-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 16^{th} subsequent pages). Selected back issues are 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 the 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 the VAS Executive Officer, Virginia Academy of Science at vasoffice@vacadsci.org.

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 the Executive Officer, Virginia Academy of Science at vasoffice@vacadsci.org.

For Information and Applications for Research Grants, you can go directly to our website or contact the VAS Executive Officer, Virginia Academy of Science at vasoffice@vacadsci.org.

To become a Member, Institutional Member, or Business Member, you can go directly to our website or contact the VAS Executive Officer, Virginia Academy of Science at vasoffice@vacadsci.org.

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 S80,000 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