

# Georgia Journal of Science

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2022

## Georgia Academy of Science Annual Meeting March 25-26, 2022 Valdosta State University

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**GEORGIA ACADEMY OF SCIENCE**  
**ANNUAL MEETING**  
**MARCH 25-26, 2022**  
**VALDOSTA STATE UNIVERSITY**  
**PROGRAM**

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March 25<sup>th</sup>, 2022

Dear Members of the Georgia Academy of Science and Guests,

Welcome to the Georgia Academy of Science Meeting at Valdosta State University! This is our first in-person meeting since the beginning of the COVID-19 pandemic, as last year we were online. I wish to extend my extreme gratitude to all of the people who have made this happen, including Dr. James Nienow, Chair of the Local Arrangements Committee and all of the committee members at VSU; Dr. Trinanjan Datta, Editor of the Georgia Journal of Science; the Associate Editors (Dr. Adam Davis and Dr. Evan Lampert); and the Section Chairs. I would also like to thank the GAS Executive and Council for a productive year.

We have a wonderful program of talks and posters lined up for the 2022 meeting! After much hardship during the first two years of the pandemic, I am excited that we will have our meeting in person and that the students and faculty who have worked so hard during this trying time get to have their work showcased here at VSU.

Please remember that as we celebrate our scholarly achievements as an Academy this year, we must not forget that the success of the Academy depends on recruiting new members! So please encourage your colleagues who have not yet joined to become members so that we can grow our membership, expand our service as ambassadors of scientific inquiry, and continue to enhance the scientific literacy of the population of Georgia.

I would also like to encourage the submission of articles based on this scholarly work to the Georgia Journal of Sciences for consideration for publication. It is an excellent venue for publication and is also open access.

Sincerely,

A handwritten signature in blue ink that reads "Amanda L. J. Duffus". The signature is written in a cursive style with a large initial 'A'.

Amanda L. J. Duffus



Dr. Richard Carvajal  
*President*

Georgia Academy of Science Members,

Welcome to Valdosta State University and our beautiful campus in the heart of South Georgia! We are honored to have an opportunity to host the 2022 Georgia Academy of Science Annual Meeting. During your visit, I hope you take time to enjoy some of the beauty of VSU: the palm trees on the Front Lawn, the live oaks and Spanish moss, the azaleas in bloom, and the Spanish mission style architecture of our many historic buildings. However, the beauty of VSU is not just skin deep. Thanks to our dedicated faculty, staff, and students, there is so much more to be proud of:

- In a partnership between the Department of Biology and the Environmental and Occupational Safety team, VSU began relocating honey bees found in undesirable, high-traffic areas to hives on the roof of the Hugh C. Bailey Science Center. The honey bees are cared for and used for educational purposes.
- The Department of Physics, Astronomy, Geosciences, and Engineering Technology at VSU is home to a rooftop Observatory and indoor Planetarium that features a Digitarium Kappa digital projector, which can reproduce the night sky as seen from anywhere on Earth or from the surface of any object in the solar system, at any time in history, past or future.
- VSU's STEAM Center for Applied Creativity and Innovation hosts an interactive exhibit called The Art and Science of Sports. Designed to increase STEAM knowledge, career opportunities, and higher education degree awareness for students in our region, visitors can explore numerous topics and applications of science and art to sports and sports-related fields like athletic training, sports management, physical therapy, media and communication, photography, etc.
- With a focus on real-world problem solving, VSU chemistry students have made groundbreaking efforts to develop new drugs to treat tuberculosis, malaria, cervical cancer, Alzheimer's disease, HPV, and HIV.
- To demonstrate the outstanding research being conducted by students and their faculty mentors, VSU hosts annual Undergraduate and Graduate Research Symposiums every spring. Students in graduate programs can be nominated by faculty in their programs to showcase high quality scholarship or research by presenting posters or Three Minute Thesis (3MT™).

I invite you to learn more about all that VSU has to offer. Again, we are so glad you are here, and I hope you have a wonderful visit to Blazer Nation!

Sincerely,

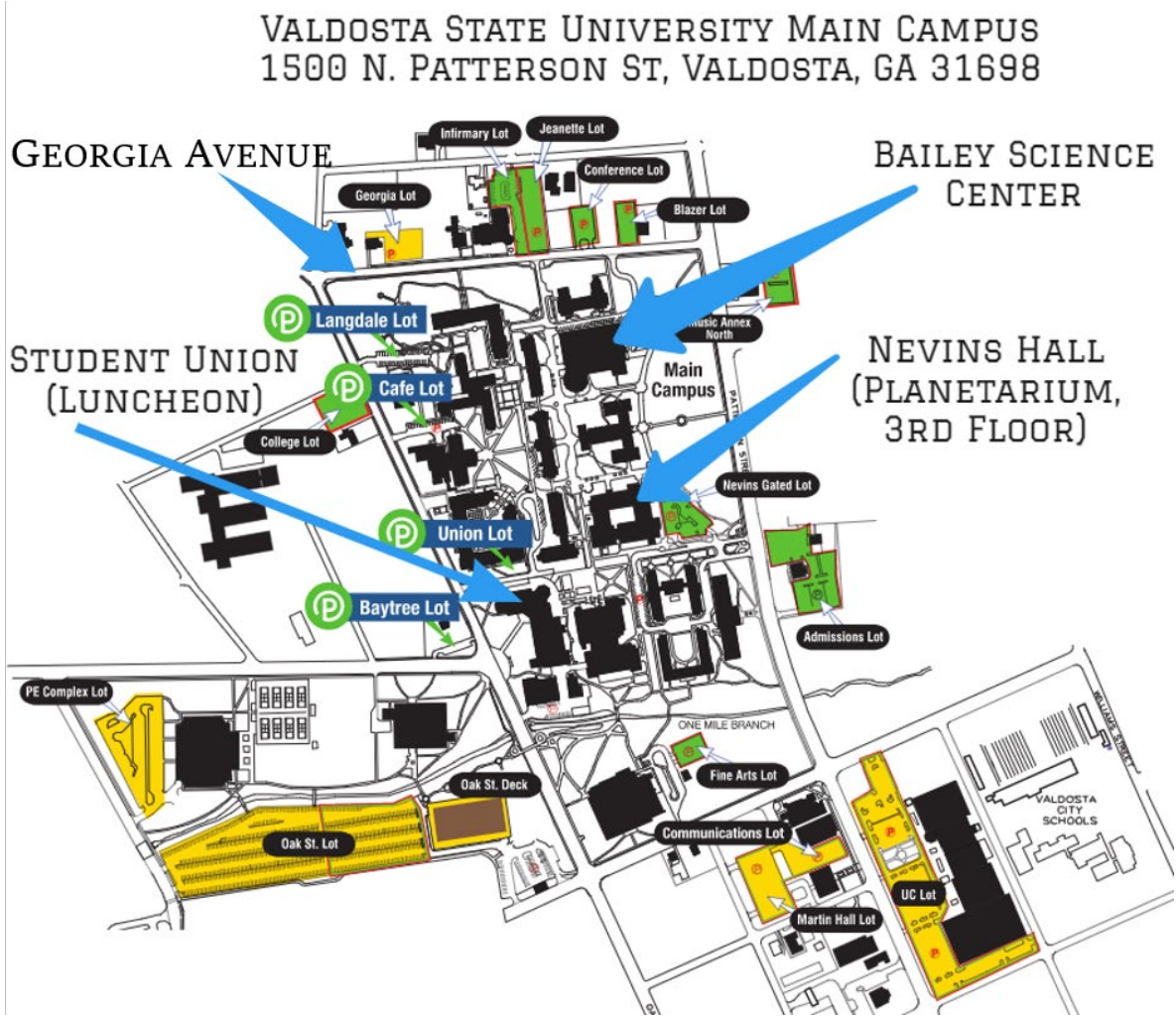
A handwritten signature in black ink, appearing to read "Richard Carvajal".

Dr. Richard Carvajal  
President

OFFICE of the PRESIDENT

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**Conference parking:** Green and yellow lots

**Friday before 3:00 pm:** Only use lots on Georgia Avenue (Georgia Lot, Infirmery Lot, Jeanette Lot, Conference Lot, Blazer Lot)

**Friday after 3:00 pm and Saturday all day:** Use any lot on campus.



## **GAS 2022 PROGRAM**

### **Friday, March 25, 2022**

- 11:00 am to 6:00 pm: On-site registration.....Bailey, Atrium
- 11:30 am to 1:00 pm: Georgia Academy of Science Board of Directors business meeting (closed to the public).....Bailey, 2023
- 8:30 am to 4:00 pm: VSU Student Competition, All-Media Juried Competition, Dedo Maranville Fine Arts Gallery and Martha G. Smart Gallery.....Fine Arts Building
- 10:00 am to 3:00 pm: Copeland African American Museum.....Thaxton (North Campus)
- 1:00 pm to 3:30 pm: Section IV, Oral Session, PHYSICS, MATHEMATICS, COMPUTER SCIENCE, ENGINEERING, AND TECHNOLOGY .....Bailey, 1023
- 1:30 pm to 3:00 pm: Georgia Beer Company Tours.....GBC, 109 S. Briggs St.
- 2:00 pm to 2:45 pm: VSU Virtual Reality Lab Experience.....Odum Library, 2220
- 3:00 pm to 3:45 pm: VSU Virtual Reality Lab Experience.....Odum Library, 2220
- 3:30 pm to 4:00 pm: VSU Planetarium Show.....Nevins, 3004
- 4:15 pm to 4:45 pm: VSU Planetarium Show.....Nevins, 3004
- 5:00 pm to 7:00 pm: Welcome Reception and Poster Presentations....Bailey, Atrium
- 5:00 pm to 5:15 pm: Opening remarks from Dr. Richard A. Carvajal (President), Dr. Robert T. Smith (Provost and VP Academic Affairs), and Dr. Pierre-Richard Cornely (Dean, College of Science and Mathematics).....Bailey, Atrium

### **Saturday, March 26, 2022**

- 7:30 am to 8:30 am: Light breakfast.....Bailey, Atrium
- 7:30 am to 10:00 am: On-site registration.....Bailey, Atrium
- 8:00 am to 12:00 pm: Oral sessions/Section business meetings
- Section I: BIOLOGICAL SCIENCES.....Bailey, 3009
- Section II: CHEMISTRY.....Bailey, 2022
- Section III: EARTH AND ATMOSPHERIC SCIENCE.....Bailey, 1024
- Section IV: PHYSICS, MATHEMATICS, COMPUTER SCIENCE, ENGINEERING AND TECHNOLOGY.....Bailey, 1023
- Section V: BIOMEDICAL SCIENCES.....Bailey, 2021
- Section VI: PHILOSOPHY AND HISTORY OF SCIENCE.....Bailey, 2202
- Section VII: SCIENCE EDUCATION.....Bailey, 1202
- Section VIII: ANTHROPOLOGY.....Bailey, 3017
- 12:15 pm to 1:45 pm: Luncheon, Keynote speaker, Student awards, and Academy Business Meeting.....Student Union, 3<sup>rd</sup> floor Ballrooms

## **Exploration Science – Going Boldly in Plant Space Biology** **Dr. Anna-Lisa Paul, University of Florida**

We humans are explorers, and regardless of the journey - across a continent, across an ocean, or across a solar system - plants will always be a part of the equation. The research of the UF Space Plants Laboratory uses molecular tools to explore how plants respond to novel environments, with a particular emphasis on spaceflight and planetary analogs. A better understanding of the molecular and metabolic strategies that plants use to physiologically adapt to spaceflight provides insight into how we can help them thrive in long-term microgravity habitats, and then take plants off planet to be a part of a human life support system on the moon or Mars.



**Dr. Anna-Lisa Paul** is a Professor at the University of Florida and the Director of UF's Interdisciplinary Center for Biotechnology Research (ICBR). She has been active in the NASA spaceflight research community for over 25 years. In that time she has launched 11 orbital experiments to study how plants respond to the spaceflight environment, taken her science to extreme terrestrial environments as planetary analogs, and also used suborbital launch vehicles to explore the effect of the transition to space on the molecular processes of plants. Paul's fundamental belief is that humans are explorers, and when we leave Earth's orbit, plants will help us make the journey. You can read more about her research program at UF and her work with the International Space Program.

**The Georgia Academy of Science Local Planning Committee extends our gratitude to the following for supporting the 99<sup>th</sup> Annual Meeting of the Georgia Academy of Sciences.**

Dr. Richard A. Carvajal, President, Valdosta State University  
Dr. Robert T. Smith, Provost, Valdosta State University  
College of Science & Mathematics, Valdosta State University  
Department of Mathematics, Valdosta State University  
Department of Biology Valdosta State University  
Georgia Beer Company

Dr. Bobbie Ticknor, Valdosta State University Virtual Reality Lab  
Dr. Martha Leake, Valdosta State University Planetarium  
Copeland African American Museum  
College of Fine Arts, Valdosta State University

Event Services, Catering, and Information Technologies, Valdosta State University



**FRIDAY PAPER PRESENTATIONS**

**\*Denotes student presenter**

**\*\* Denotes student research in progress**

**Section IV: Physics, Mathematics, Computer Science and Technology  
Room 1023, Bailey Science Center  
Jay Dunn, Presiding**

- 1:00 QUANTITATIVE ANALYSIS OF DESALINATION EFFICIENCY OF AMINES FOR OPTIMIZATION OF TEMPERATURE SWING SOLVENT EXTRACTION PROCESS\*\*  
*Elizabeth Humphries\*, Jordi Lainez\*, Diana C. Kem\*, and Seunjin Lee*
- 1:15 DO EXOPLANETS EXIST AROUND HIGH VELOCITY STAR SYSTEMS?\*\*\*  
*Braven Lyall\*, Idan Ginsburg, and Sébastien Lépine*
- 1:30 A MATHEMATICAL MODEL FOR MOSQUITO POPULATION DYNAMICS WITH GENETICS OF INSECTICIDE RESISTANCE\*\*  
*Thomas Evans\**
- 1:45 IMPLEMENTATION OF A HAIRPIN MODEL BASED PASSIVE MICROWAVE TAG USING MICROSTRIP STRUCTURE  
*W. Logan Spooner\* and Shantanu Chakraborty*
- 2:00 SIMPLE MODEL OF THE HYDROGEN MOLECULE POTENTIAL\*\*  
*Dorien E. Carpenter, Javier E. Hasbun, and L. Ajith DeSilva*
- 2:15 **Break**
- 2:30 IMAGE ANALYSIS BETWEEN CANCEROUS AND HEALTHY SERUM THROUGH DRYING PROCESS\*\*  
*Hikma Adem, Mathes Dayananda, and Unil Perera*
- 2:45 VALDOSTA SMART CITY PROJECT OUTCOMES AND WHAT MADE IT A FINALIST IN 2021 WORLD SMART CITIES AWARD  
*Barry Hojjatie, Armondo Sam Rodriguez, and Pat Collins*
- 3:00 JGRADER: DEVELOPMENT OF A SOFTWARE SYSTEM TO GRADE OBJECT-ORIENTED PROGRAMS  
*David R. Gibson*
- 3:15 STUDY OF A PLASMA PULSE BY USE OF THE HILBERT-HUANG TRANSFORM  
*Dereth J. Drake and James E. Henderson*

**FRIDAY POSTER PRESENTATIONS**  
**Bailey Science Center, Atrium**  
**5:00–7:00 pm**

**Section I Posters: Biological Sciences**

OPHIDIOMYCES OPHIDIICOLA INFECTION PREVALENCE IN TIMBER  
RATTLESNAKES (*CROTALUS HORRIDUS* LINNEAUS, 1758) FROM THE LOWER  
PIEDMONT OF CENTRAL GA, USA \*\*

*Patricia L. Bartlett\**, *Anna F. Tipton\**, *Morgan Thompson\**, *M. Reagan Thronton\**,  
*Dominic L. DeSantis*, and *Amanda L.J. Duffus*

MORPHOLOGICAL EFFECTS ON *GOMPHONEMA PARVULUM* GROWN UNDER  
DIFFERENT STRESSORS\*\*

*Sydney Brown*, *Katie Johnson*, and *Kalina Manoylov*

CHARACTERIZATION OF A CUTANEOUS MICROBIOME OF A COMMUNITY OF  
LUNGLESS SALAMANDERS IN CHEROKEE COUNTY, GEORGIA\*\*

*Salvador Castillo*, *Jessica Wooten Eagle*, *C. Keith Ray*, and *Zach Felix*

HOW DOES WATER QUALITY, PHYSICAL SETTING, AND COASTAL  
DEVELOPMENT AFFECT OYSTER SPAT SETTLEMENT IN SOUTHERN  
GEORGIA SALT MARSHES?

*Kara\* Cruse*, *Kyra\* Morris*, and *Thomas Hancock*

EFFECTS OF CAPTIVITY AND CAPTIVE-BREEDING ON THE CUTANEOUS  
MICROBIOME OF LUNGLESS SALAMANDERS\*\*

*Princess Flanders*, *Jessica Wooten Eagle*, *Tim Hermann*, *C. Keith Ray*, and *Zach  
Felix*

A DNA-BARCODING APPROACH TO THE IDENTIFICATION OF INVASIVE  
AMBROSIA BEETLES IN LUMPKIN COUNTY, GEORGIA

*Daniel L. Hamilton* and *Shane A. Webb*

SPIDER DIVERSITY ACROSS AN URBAN GRADIENT

*Domonique Hill*, *Winter Goble*, and *Rebecca Godwin*

TEST OF PREDATOR AVOIDANCE BY LARVAE OF THE BLUE RIDGE TWO-  
LINED SALAMANDER (*EURYCEA WILDERAE*) IN APPALACHIAN STREAMS

*Taylor M. Hopkins\**, *Emmeline Lombard*, and *Carlos D. Camp*

RELATIONSHIP BETWEEN SIZE AND FORAGING IN DUSKY SALAMANDERS  
(GENUS *DESMOGNATHUS*)

*Noah Irwin\**, *Ethan Mann*, *Cooper Kework\**, *Taylor Hopkins\**, and *Carlos D. Camp*

COMPARISON OF INFECTION PREVALENCE AND INTENSITY BY THE TREMATODE *METAGONIMOIDES OREGONENSIS* BETWEEN TWO SPECIES OF DESMOGNATHAN SALAMANDER

*Cooper Kework\**, *Noah Irwin\**, and *Carlos D. Camp*

ON GOING INVESTIGATIONS OF DWARF SEAHORSE (*HIPPOCAMPUS ZOSTERAE*) REPRODUCTIVE ECOLOGY IN A LAB ENVIRONMENT

*Atalya D. Manchester*, *Dalila A. Sanchez*, *Darshi N. Patel*, *Megan N. Sims*, and *Emily Rose*

REEVALUATING THE IMPACT OF RAILWAYS ON WILDLIFE CONSERVATION\*\*

*Jenna B. Myers\** and *Michael J. Bender*

E411K P-BODY PROTEIN INTERACTIONS\*\*

*Kevin Neubrecht\**, *La'Quita Randolph\**, and *Kasey Karen*

THE EFFECTS OF OCEAN ACIDIFICATION ON LARVAL DEVELOPMENT AND SURVIVORSHIP IN *LYTECHINUS VARIEGATUS*

*Emily Pace\**, *Nancy Dalman*, and *Margaret Smith*

IDENTIFYING THE EFFECTS OF ALGAL TURBIDITY ON THE REPRODUCTIVE SUCCESS AND MATING BEHAVIORS OF DWARF SEAHORSES (*HIPPOCAMPUS ZOSTERAE*)\*\*

*Darshi N. Patel*, *Dalila A. Sanchez*, *Megan N. Sims*, *Atalya D. Manchester*, and *Emily Rose*

VALIDATING HIGH-FREQUENCY ACCELEROMETER FIELD RECORDINGS OF FORAGING BEHAVIORS IN PIT VIPERS\*\*

*Morgan L. Thompson*, *Dominic L. DeSantis*, and *Anna F. Tipton*

BIOLOGICAL EFFECTS OF BENZOTHAZOLE DERIVATIVES: ALS CELLS AND THE EFFECTS OF THE TDP-43 PROTEIN\*\*

*Alexandria White*, *Destini Thornton*, *Shyrisse Ramos*, *Kerri L. Shelton*, and *Monica Frazier*

ETHOGRAM DEVELOPMENT OF *TRICHOPLUSIA NI*\*\*

*Chloe Meewes\**, *Logan Pearson\**, *Erin Barding*, *Ryan Shanks*, and *Margaret Smith*

## **Section II Posters: Chemistry**

RHODAMINE-BASED FABRIC SENSOR FOR ACID RECOGNITION

*Daeshe' R. McCoy\** and *Tolulope O. Salami*

ACTIVITY AND STABILITY OF ENGINEERED HEME BIOCATALYSTS IN DEEP EUTECTIC SOLVENTS

*Chloe E. Ward\**, *Kevin J. Eppes Jr.\**, *Karla S. Rueda\**, and *Gopeekrishnan Sreenilayam*

OPTIMIZATION OF A WILD-TYPE HEMOGLOBIN CATALYZED  
CYCLOPROPANATION REACTION FOR UNDERGRADUATE LABORATORY  
COURSE\*\*

*Estefani Quinones\* and Gopeekrishnan Sreenilayam*

THE CHEMICAL DEPOLYMERIZATION OF POLYLACTIC ACID (PLA)  
ACCELERATED BY MICROWAVE HEATING\*\*

*Brennan M. Murphy\* and Jeremy T. Cooper*

DEVELOPING PROTEIN-POLYMER NANOCONSTRUCTS AS REUSABLE  
BIOCATALYSTS\*\*

*Kevin J. Eppes Jr.\* and Gopeekrishnan Sreenilayam*

#### **Section IV Posters: Physics, Mathematics, Computer Science and Technology**

HARDWARE DEMONSTRATIONS AND EXPERIMENTS FOR TEACHING THE  
COMPUTER ORGANIZATION COURSE

*Chunlei Liu*

MODELING FOR TITAN ATMOSPHERIC ENTRY

*Rocky A. Pena\* and Dereth J. Drake*

REVIEW OF J AND H FILTER BRIGHTNESS OF MERCURY, VENUS, MARS,  
JUPITER AND SATURN

*Richard W. Schmude*

SIMULATION OF DISTRIBUTED FAULT CONTAINMENT ALGORITHM USING  
RANDOMIZED SCHEDULER

*Anurag Dasgupta and David K. Tan\**

SOLUTION PROCESS SPIRO-MeOTAD NANO-FILMS BY SPIN COATING  
TECHNIQUE

*Tobee Jefferson, Jacob Keener, and L. Ajith DeSilva*

HIGH-SPEED AERODYNAMICS OF PLANE CRASHES

*Alicia R. Heger\*, Benjamin C. West\*, and Dereth J. Drake*

**Section V Posters: Biomedical Sciences**

THE EFFECT OF DELTA-9 TETRAHYDROCANNABINOL ON DEVELOPMENTAL MORPHOLOGY IN ZEBRAFISH\*\*

*Madison M. Smith\* and Linda G. Jones*

GENETIC ANNOTATION AND BIOINFORMATIC ANALYSIS OF THE *lin-28*, *Dsor1*, and *rictor* GENES IN *DROSOPHILA WILLISTONI*

*Jessica R. Odum\*, Kathleen S. Hughes, and Brian W. Schwartz*

ANNOTATION OF THE *lin-28* GENE ACROSS THREE SPECIES OF *DROSOPHILA*\*\*

*Simran K. Chhina\*, Jessica R. Odum\*, Kathleen S. Hughes, and Brian W. Schwartz*

**Section VII Posters: Science Education**

DEVELOPING AN EXPERIENTIAL LEARNING TECHNIQUE FOR TEACHING GENETIC PARENTAGE ANALYSIS IN THE LABORATORY\*\*

*Megan Sims\* and Emily Rose*

AN AT-HOME TITRATION USING BAKING SODA, LEMON JUICE, AND MENTOS®.

*Jennifer Nguyen\*, Ali Akdeniz, Chantelle Anfusio, and Joshua Morris*

## SATURDAY PAPER PRESENTATIONS

**\*Denotes student presenter**

**\*\* Denotes student research in progress**

### **Section I: Biological Sciences Room 3009, Bailey Science Center Jason Lang, Presiding**

- 8:00 THE EFFECT OF ADENOVIRUS E4ORF3 AND DDX6 ON RIG-I MEDIATED INTERFERON RESPONSE\*\*  
*Jadalynn A. Ginn and Kasey A. Karen*
- 8:15 REMOTE SENSING ANALYSIS OF EASTERN HEMLOCK IN RESPONSE TO THE HEMLOCK WOOLY ADELGID AND BIOLOGICAL CONTROL IN THREE NORTH GEORGIA RELEASE SITES  
*Guerin Brown and Paul T. Arnold*
- 8:30 THE GEOGRAPHIC DISTRIBUTION AND PARASITE INFECTION RATE OF *ANOPHELES CRUCIANS*  
*Eric W. Chambers, Zoe A. Barrett, Richard H. West, and Mark S. Blackmore*
- 8:45 CAN THE SYNERGISTIC RELATIONSHIP BETWEEN ELEMENTAL SULFUR AND SYNTHETIC FUNGICIDES OBSERVED IN THE FIELD BE EXPLAINED BY THEIR EFFECT ON THE FUNGAL GROWTH OF *NORTHOPASSALAORA PERSONATA*?\*\*  
*Kenyanna N. Taylor\*\*, Emily Cantonwine\*\*, and Albert Culbreath*
- 9:00 DETERMINING MINIMUM INHIBITORY CONCENTRATION OF SODIUM SALICYLATE AND DEVELOPING PCR-BASED IDENTIFICATION OF *PROVIDENCIA RETTGERI* AND *PROVIDENCIA STUARTII*  
*Shamaya L. Paylor, Erica L. Hart, Md Niamul Kabir, and Olabisi O. Ojo*
- 9:15 'BEST BY' DATE: RELIABILITY OF SPECIES IDENTIFICATION BASED ON FRESHNESS OF MATERIAL  
*Elizabeth L. Durham and Kristine N. White*
- 9:30 A SURVEY OF LENTIC MACROINVERTEBRATES IN MILLEDGEVILLE, GEORGIA  
*Nadya S. Gutierrez and Kristine N. White*
- 9:45 CARIBBEAN AMPHIPOD DIVERSITY IN PANAMA  
*Sally J. Sir and Kristine N. White*



10:00 EFFECTS OF NEST BOX TEMPERATURE MITIGATION TREATMENTS ON REPRODUCTIVE SUCCESS AND NESTLING DEVELOPMENT IN A SOUTHEASTERN POPULATION OF EASTERN BLUEBIRDS (*SIALIA SIALIS*)

*Christopher G. Horacek, Katie Stumpf, and Wayne Powell*

10:15 **Break**

10:30 **Section Business Meeting**

11:30 INTEGRATING RADIO TELEMTRY AND ACCELEROMETRY TO EVALUATE THE EFFECTS OF ROADWAYS ON THE MOVEMENT BEHAVIOR OF TIMBER RATTLESNAKES (*CROTALUS HORRIDUS*)\*\*

*Anna F. Tipton, Morgan L. Thompson, and Dominic L. DeSantis*

11:45 THE EFFECTS OF TESTOSTERONE EXPOSURE ON UROGENITAL TRACT ANDROGEN RECEPTOR DISTRIBUTION IN IMMATURE EASTERN FENCE LIZARDS

*Charleigh R. Stepp and Matthew R. Milnes*

**Section II: Chemistry**  
**Room 2022, Bailey Science Center**  
**Brian Hoffman, Presiding**

9:15 COMPARATIVE STUDY ON THE CHARACTERISTICS AND PERFORMANCE OF HYDROGELS FOR NUTRIENTS RECYCLE\*\*

*Tyler J. Donnelly\* and Seungjin Lee*

9:30 MICROBIAL FERMENTATION OF KUDZU (*PUERARIA MONTANA*): FROM INVASIVE PEST TO BIOFUEL FEEDSTOCK\*\*

*Jordan T. Pandolph\*, Andrea L. Kwiatkowski, and Charles D. Swor*

9:45 SYNTHESIS AND TESTING OF PENICILLIN DERIVATIVES: AN INTERDISCIPLINARY PROJECT

*Josy Hill\*, Emily Rankin, and Elaine Bailey*

10:15 **Break**

10:30 **Section Business Meeting**

**Section III: Earth and Atmospheric Sciences**  
**Room 1024, Bailey Science Center**  
**Alfred J. Mead, Presiding**

- 8:15 IRIS METHODS FOR QUANTIFYING IRON REDUCTION AND REDOX IN WETLAND SOILS\*\*  
*Jessy A. Everett, Samuel Mutiti, Christine Mutiti, Allison VandeVoort, and Dave Bachoon*
- 8:30 BIOFILTERS FOR DRINKING WATER FILTRATION\*\*  
*Allison Esmond, Amber Johnson, Schuylar Bankey, Jessica Everett, and Samuel Mutiti*
- 8:45 A COMPARISON OF MICROPLASTIC CONCENTRATIONS IN FRESHWATER COLUMNS\*\*  
*Abigail Iacobucci and Debra Dooley*
- 9:00 PATTERNS OF BIOTIC AND ABIOTIC CONTAMINATION WITHIN A SMALL WATERSHED IN NORTHEAST GEORGIA  
*Pape M. Ndiaye and Timothy Owen Menzel*
- 9:15 PRELIMINARY ASSESSMENT OF COMPOST QUALITY AND SAFETY AT GEORGIA COLLEGE\*\*  
*Kristen Wilder\* and Allison Rick VandeVoort*
- 9:30 ASSESSING THE QUALITY OF GEORGIA COLLEGE'S FOOD WASTE COMPOST\*\*  
*Cyaira S. Vest, Caleb N. Fields, Christine Mutiti, and Samuel Mutiti*
- 9:45 ANALYZING THE SHARK PALEOECOLOGY OF COASTAL GEORGIA FROM THE MIOCENE AND PLIOCENE EPOCHS  
*Benjamin Joseph Angalet and Joshua Lee Clark*
- 10:15 **Break**
- 10:30 **Section Business Meeting**

**Section IV: Physics, Mathematics, Computer Science and Technology**  
**Room 1023, Bailey Science Center**  
**Jay Dunn, Presiding**

- 9:00 RADIATION METHOD APPROACH APPLIED TO VIBRATING GRANULAR MEDIA, EXTENSION FROM MICROSCOPIC TO MESOSCOPIC SCALES FOR VIBRATIONS MITIGATION AND ATTENUATION.  
*Hasson Tavossi*
- 9:15 MODELING AUTOMATA WITH CLASSICAL MECHANICS  
*Javier E. Hasbun*
- 9:30 MILANKOVITCH CYCLES FOR POTENTIAL EARTH-ANALOGS IN ALPHA CEN AB  
*Billy Quarles, Gongjie Li, and Jack J. Lissauer*
- 9:45 OPTICAL CONTINUUM VARIABILITY OF THE RADIO GALAXY 3C 390.3  
*Kenneth S. Rumstay*
- 10:00 THE MOON'S BRIGHTNESS DURING THE JANUARY 21, 2019 TOTAL LUNAR ECLIPSE  
*Richard W. Schmude*
- 10:15 **Break**
- 10:30 **Section Business Meeting**
- 11:00 RECENT JUPITER IMPACT EVENTS  
*Richard W. Schmude*
- 11:15 GEOMETRIC ALGEBRA: THE "ROYAL ROAD" TO QUANTUM GRAVITY  
*Dennis W. Marks*
- 11:30 COST-EFFECTIVE MICROWAVE ABSORBER WITH METAL PATCHES  
*Arun K. Saha and Walker G. Pendleton*
- 11:45 STOCHASTIC AND DETERMINISTIC METHODS FOR BIOCHEMICAL REACTION NETWORKS - L1 GENE TRANSCRIPTION  
*Anilkumar Devarapu*

**Section V: Biomedical Sciences**  
**Room 2021, Bailey Science Center**  
**Jennifer Schroeder, Presiding**

- 9:00 ETHANOL EXTRACTS MADE FROM CHICKEN GRILLED WITH CHARCOAL, BUT NOT PROPANE, SHOW HIGH AHR ACTIVATION IN MOUSE LIVER CELLS  
*Andrew Z. Wingate\* and Jennifer C. Schroeder*
- 9:15 ASSESSING THE ANTIMICROBIAL ACTIVITY OF LEMON AND LEMONGRASS ESSENTIAL OILS AGAINST COMMON MICROBES FOUND IN SKIN INFECTIONS  
*Faith K. Reffitt\*, Bryce T. Parrish\*, and Andrea L. Kwiatkowski*
- 9:30 EVOLUTION OF THE CycG GENE OF THE INSULIN-SIGNALING PATHWAY ACROSS THE *DROSOPHILA* GENUS  
*Jonathan K. Segura\* and Brian W. Schwartz*
- 9:45 DMSO, BUT NOT WATER, CAN EXTRACT COMPOUNDS FROM TURF FIELD INFILL THAT ACTIVATE THE ARYL HYDROCARBON RECEPTOR  
*Veronica Pablo Raymundo\* and Jennifer C. Schroeder*
- 10:00 ANTIMICROBIAL EFFECTS OF EUCALYPTUS AND LAVENDER ESSENTIAL OILS ON COMMON EPIDERMAL BACTERIAL AND FUNGAL STRAINS  
*Savannah L. Poole\*, Bryce T. Parrish\*, and Andrea L. Kwiatkowski*
- 10:15 **Break**
- 10:30 **Section Business Meeting**

**Section VI: Philosophy and History of Science  
Room 2202, Bailey Science Center  
Ronald Mickens, Presiding**

- 9:15 W. PETER HAMBRIGHT: FROM CHICAGO TO HOWARD UNIVERSITY CHEMISTRY  
*Adegboye O. Adeyemo, Janet Butler Reid, and Albert N. Thompson, Jr.*
- 9:30 UNDERSTANDING THE HEMINGWAY MEASURE OF ADULT CONNECTEDNESS SURVEY BY UTILIZING DATA ANALYSIS  
*Gildardo Maya Bautista and Ping Ye*
- 9:45 DISPROVING THE HIERARCHICAL MODEL OF SCIENCE AND PROPOSING A NEW MODEL OF SCIENCE: THE OVERLAPPING PROTEIFORM BUBBLE MODEL OF SCIENCE  
*Mark D. Thomas*
- 10:15 **Break**
- 10:30 **Section Business Meeting**

**Section VII: Science Education  
Room 1202, Bailey Science Center  
PaviElle Johnson, Presiding**

- 9:30 DIGITAL TEXTBOOK OF PRINCIPLES OF CHEMISTRY I  
*Antara Dutta, Maher Attaya, and Ahmed A. Baosman*
- 9:45 CRITICAL MENTORING IN STEM LAB\*\*  
*Manisha Maurya\**
- 10:15 **Break**
- 10:30 **Section Business Meeting**

**Section VIII: Anthropology**  
**Room 3017, Bailey Science Center**  
**Susan Kirkpatrick Smith, Presiding**

- 9:00 COMMUNITY AND ACADEMIC PERSPECTIVES ON THE EXISTENCE OF SKELETAL TEACHING COLLECTIONS AND THEIR REPRESENTATION OF STRUCTURAL INEQUITIES IN THE SOUTHEASTERN UNITED STATES\*\*  
*Sydney Munkus\* and Alice F. Gooding*
- 9:15 SOMETHING OLD SOMETHING NEW: REFINING CHRONOLOGIES IN NORTHWEST INDIA THROUGH RADIOCARBON  
*Teresa P. Raczek*
- 9:30 ANALYSIS OF VERTEBRAE PATHOLOGIES OF GRAVE A650 CHRYSI ISLAND, CRETE, GREECE  
*Abbey E. Bartmess and Susan Kirkpatrick Smith*
- 9:45 PATHOLOGICAL ANALYSIS OF HAND AND WRIST BONES IN CHRYSI (CRETE)\*\*  
*Ashley Goodman and Susan Kirkpatrick Smith*
- 10:00 ACCURACY OF MOBILE DEVICE 3D SCANNING APPLICATIONS WHEN MAPPING HUMAN REMAINS IN SIUMLATED CLANDESTINE GRAVES\*\*  
*Alexander Mitchell and Alice F. Gooding*
- 10:15 **Break**
- 10:30 **Section Business Meeting**
- 11:00 INDICATORS OF THORACIC OSTEOARTHRITIS COMPARED TO RELATIVE AGE ESTIMATED USING THE VERTEBRAL EPIPHYSEAL RING  
*Loctavia Green and Frank L. Williams*
- 11:15 ANCIENT DENTISTRY: DENTAL CARIES OR PARAMASTICATORY BEHAVIOR IN A MANDIBULAR THIRD MOLAR  
*Morgan Paskins, Amanda Pregibon, and Frank L. Williams*



## **HISTORY AND DESCRIPTION OF THE GEORGIA ACADEMY OF SCIENCE**

Organized in 1922 and incorporated as a nonprofit organization in 1953, the Georgia Academy of Science continues to grow in size and academic strength. The interests of Academy members encompass all aspects of science and that interest is expressed through participation in one or more of eight sections: I Biological Sciences, II Chemistry, III Earth & Atmospheric Sciences, IV Physics, Math, Computer Science, Engineering & Technology, V Biomedical Sciences, VI Philosophy & History of Science, VII Science Education, VIII Anthropology.

The Academy is dedicated to the promotion of science education and the fostering of scientific research in the state of Georgia. To that end we publish the Georgia Journal of Science (<http://www.gaacademy.org/journal.html>) and hold annual scientific meetings that emphasize the research presentations of undergraduate, graduate students as well as of the faculty.

Further information about the Academy can be found in the following web pages:

Georgia Academy of Science: <http://www.gaacademy.org/>

Constitution: [http://www.gaacademy.org/GAS\\_Constitution\\_2016.pdf](http://www.gaacademy.org/GAS_Constitution_2016.pdf)

By-Laws: [http://www.gaacademy.org/GAS\\_Bylaws\\_2016.pdf](http://www.gaacademy.org/GAS_Bylaws_2016.pdf)

Membership application: <http://www.gaacademy.org/membership.html>