

2018

Number 1, Program of the Annual Meeting

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GEORGIA ACADEMY OF SCIENCE

ANNUAL MEETING

APRIL 13TH-14TH, 2018

UNIVERSITY OF WEST GEORGIA

PROGRAM

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THE GEORGIA ACADEMY OF SCIENCE

Supporting the Physical, Environmental, Social,
Biological, and Medical Sciences

13 February 2018

Dear Colleagues of the Academy,

Welcome to the University of West Georgia for our 2018 Georgia Academy of Science meeting! I wish to extend our heartfelt thanks to the Science Faculty and Administration of this great Institution for hosting this meeting. I would specifically like to thank Dr. Neal Chesnut and Dr. Javier Hasbun for all of their hard work in making arrangements for this meeting and for its program. I am also grateful to the GAS Council and Committees for a very productive year leading up to this meeting.

As we celebrate many of Georgia's scientific endeavors at this meeting, let us continue to foster the growth of our Academy through the recruitment of fellow faculty and students, and the encouragement of others from Colleges & Universities throughout Georgia to share in this forum. It is critical that we continue to champion scientific research and be important ambassadors of science to the citizens of Georgia. In addition, Georgia Academy of Science is a wonderful venue for both undergraduate and graduate students to develop their research and presentation skills as they transition into professional practitioners of science.

Thank you for participating in this meeting, and I wish for you all a great time of scientific exchange and collegiality!!!

Sincerely,

A handwritten signature in black ink that reads 'Paul T. Arnold'. The signature is written in a cursive, slightly slanted style.

Paul T. Arnold
President, Georgia Academy of Science



Greetings Georgia Academy of Science Members!

Welcome West! The University of West Georgia is honored to host the 2018 Georgia Academy of Science Annual Meeting. We have been busy making preparations for several months now and we are excited for you to see all the amazing things happening at UWG.

UWG is a Southern Association of Colleges and Schools (SACS) Level VI University validating the expanse of our graduate programs (four doctoral), and is now a university of over 13,500 students and over 60,000 alumni - big enough to provide all that you need to succeed, yet small enough to know your name. We have accomplished so many things – record enrollment, record degrees conferred, record scholarships awarded, record fundraising, record 4 & 5 year grad rates, record incoming freshman GPA, record economic impact, and record institutional budget. UWG aspires to be the best comprehensive university in America - sought after as the best place to work, learn, and succeed. I'm proud to be president of such a dynamic university that is in motion and continually on the rise.

Our College of Science and Mathematics consists of six departments (Biology, Chemistry, Computer Science, Geosciences, Mathematics, and Physics) and offers a wide variety of undergraduate and graduate programs, in addition to serving the core science and mathematics needs of all students at UWG and providing professional development to the K-12 teaching community. Our programs are student-centered, providing enriching experiences to the students, from small classes to research experiences. We make it a point to prepare students to ask questions about the mysteries of the universe as well as to find STEM (Science, Technology, Engineering and Mathematics) related jobs.

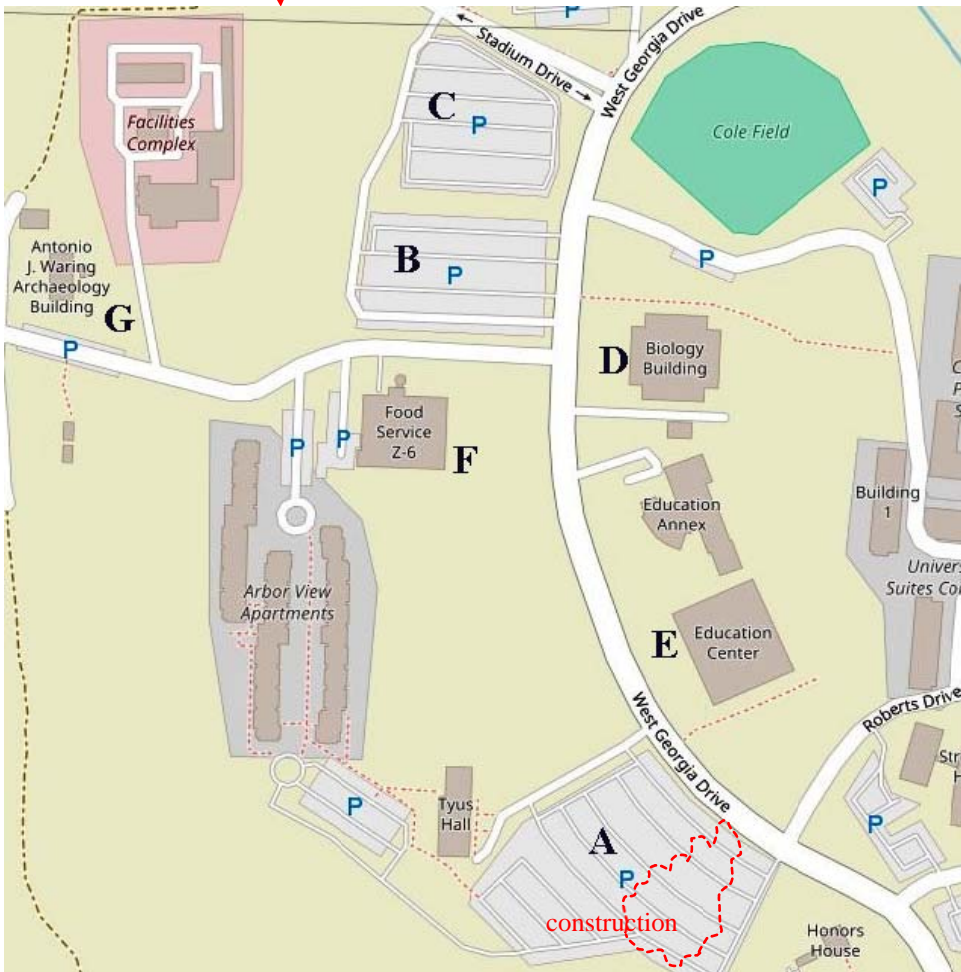
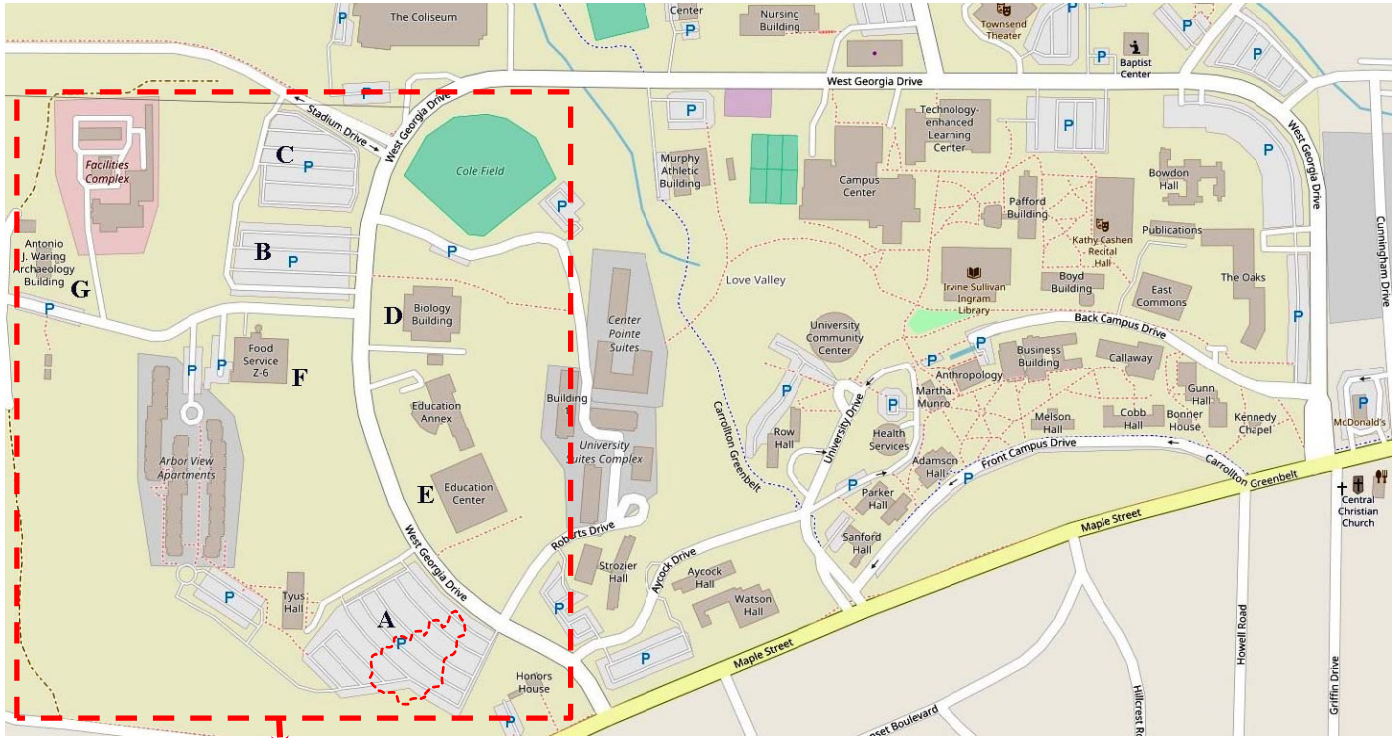
I invite you to get to know and explore UWG. Enjoy our campus, search our website, and most of all, have an exciting and energizing meeting. We hope to see you again soon.

Sincerely,

A handwritten signature in black ink, appearing to read "Kyle Marrero".

Dr. Kyle Marrero
President

University of West Georgia Campus, 1601 Maple Street, Carrollton, GA



A, B, C: Tyus, Z-6, and Coliseum freely available parking areas
D, E: Biology and Education Center (EC) halls
F: Z-6 or Food Services dining hall
G: Waring Laboratory

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University of West Georgia Local Arrangements Committee



In the picture: (from left) Abdollah Khodkar, Anja Remshagen, Gregory Payne, Frank Fontanella, Neal Chesnut, Javier Hasbun, Ajith DeSilva, and Julie Talbot.

Not present: Anne Gaquere, Lok Lew Yan Voon, Nicholas Sterling, Douglas Stuart, Sharmistha Basu-Dutt, Chris Tabit, James Mayer, Kimberley Scasny, Brent Gilles, and Stacey Britton.

GAS 2018 PROGRAM

Friday, April 13, 2018

- 10:00 am to 6:00 pm: On-site Registration.....Main Lobby, Education Center (EC)
- 11:30 am to 1:00 pm: Georgia Academy of Science Board of Directors business meeting
(closed to the public).....Room 225, Education Center (EC)
- 12:30 pm to 4:45 pm: Section IV: Oral session, PHYSICS, MATHEMATICS,
COMPUTER SCIENCE,
ENGINEERING, AND TECHNOLOGY
.....Classroom 004, EC
- 3:30 pm to 4:30 pm: Section I: Oral session, BIOLOGICAL SCIENCES
..... Classroom 005, EC
- 5:00 pm to 6:00 pm: Poster presentations, refreshmentsClassrooms 001-003, EC
- 6:00 pm to 6:15 pm: Opening remarks, Dr. Paul Arnold and UWG President Kyle Marrero
..... Classrooms 001-003, EC
- 6:15 pm to 7:15 pm: Keynote lecture by A. G. Unil Perera..... Classrooms 001-003, EC

Infrared Radiation for Healthy Living: Disease Diagnostics

The incidence rates of cancers and other chronic diseases have been increasing in many regions and populations. There are more than 70,000 new cases of inflammatory bowel diseases (IBD) such as ulcerative colitis, diagnosed every year. Established diagnostic techniques for cancers and ulcerative colitis are invasive, cause discomfort, and are not cost-effective. The compliance rate for the screening of such diseases is very small due to this discomfort, expense, and the risk of complications. Thus, it is important to develop minimally invasive or noninvasive and cost-effective prescreening strategies.

Attenuated total reflection Fourier transform infrared (ATR-FTIR) spectroscopy accompanied with different data analysis frameworks can provide an excellent spectroscopic technology to extract biochemical information from bio-fluids, which can lead to the identification of diseases. Results show that dried serum samples can be used to detect the biochemical changes induced by cancers and IBDs. This potential technology can be further developed into a noninvasive, personalized diagnostic tool in which patient-to-patient differences in molecular signatures would allow the assessment of disease status and personalized drug management.

A. G. Unil Perera is a Regent's Professor of Physics, in the Department of Physics & Astronomy, at Georgia State University. He obtained his Ph.D. from the University of Pittsburgh. His primary research focus is on developing multi-band and terahertz photon detectors. Recently, he has focused on applying IR techniques to diagnostics. He has received various awards including the GSU Alumni Distinguished Professor Award. Dr. Perera has also had more than 190 technical articles published and has 5 patents (or applications) to his credit. He is a Fellow of the American Physical Society, the Society of Photo-Instrumentation Engineers, and of the Institute of Electrical and Electronics Engineers. He is also an Editor of the IEEE Journal of Electron Device Society.

Saturday, April 14, 2018

7:30 am to 8:30 am: Light Breakfast.....Main Lobby, Education Center (EC)

7:30 am to 9:30 am: On-site Registration.....Main Lobby, Education Center (EC)

8:00 am to 12:00 pm: Oral Sessions/Section Business Meetings

Section I: BIOLOGICAL SCIENCES.....Classroom 005, EC

Section II: CHEMISTRY.....Classroom 003, EC

Section III: EARTH AND ATMOSPHERIC SCIENCES.....Classroom 002, EC

Section IV: PHYSICS, MATHEMATICS, COMPUTER SCIENCE, ENGINEERING
AND TECHNOLOGY.....Classroom 004, EC

Section V: BIOMEDICAL SCIENCES.....Classroom 226, EC

Section VI: PHILOSOPHY AND HISTORY OF SCIENCE.....Classroom 001, EC

Section VII: SCIENCE EDUCATION.....Classroom 225, EC

Section VIII: ANTHROPOLOGY.....Classroom 229, EC

12:15 pm to 1:45 pm: Lunch, Student awards, and Academy Business Meeting

.....Lower Level Z-6 (dining hall)

2:00 pm: Special Events

- Tour of the Antonio J. Waring Jr. Archaeological Laboratory (sign-up required)
This is a research facility dedicated to the scholarly pursuit of knowledge about past cultures within Georgia and nearby areas. The laboratory supports the archaeological research and instructional activities of the faculty in the Department of Anthropology and is a resource for visiting scholars from across the United States.
- Tour of the New Biology Building (sign-up required)
The Biology Building has recently undergone extensive renovations and will be a premiere facility on the UWG campus.
- Recommended self-guided activities in the Carrollton area
 - Carrollton's Green Belt provides miles of beautiful walking/biking trails on a paved path.
 - Carrollton's Downtown Square has excellent restaurants in a beautiful small town setting.

FRIDAY PAPER PRESENTATIONS

***Denotes student presenter**

****Denotes student research in progress**

Section I: Biological Sciences

Classroom 005, Education Center (EC)

Margaret Smith, Presiding

- 3:30 A STUDY OF MAMMAL DIVERSITY AND ABUNDANCE IN RURAL, SUBURBAN, AND URBAN TEMPERATE FORESTS LOCATED IN NORTHERN GEORGIA USING MULTIPLE TYPES OF SCENT LURES AND TRAIL CAMERAS**, Carol K. Smith * and Mark A. Schlueter
- 3:45 COMPARISON OF SPOTTED BASS POPULATIONS AMONG THREE NORTH GEORGIA RESERVOIRS**, Sarah Gossett*, Harrison Barton, and Johnathan G. Davis
- 4:00 ASSESSING WATER-DEPENDENCE OF A STORED GRAIN PEST, TENEBRIO MOLITOR**, Kerstin G. Thulé*, Alexander E. Olvido, and Jim Konzelman
- 4:15 THE INFLUENCE OF LYTIC AND LYSOGENIC MYCOBACTERIOPHAGES ON THE EFFICACY OF ANTI-MICOBACTERIAL DRUGS, Shea Alexandra Morris* and Indiren Pillay
- 4:30 EFFECT OF MS-222 DOSAGES ON SEDATION AND RECOVERY TIME OF TWO NON-GAME FISHES, Elizabeth Lowe*, Bailey Grantham*, and Johnathan G. Davis

Posters (on display 5:00–6:00 pm, Classrooms 001-003, EC)

Section IV: Physics, Mathematics, Computer Science, and Technology

Classroom 004, Education Center (EC)

L. Ajith DeSilva, Presiding

- 12:30 STUDY OF EXTENDED WAVELENGTH INFRARED DETECTION ON P-GAAS/ALGAAS HETEROSTRUCTURES, Dilip Chauhan*, A. U. Perera, Lianhe, Li, Li Chen, Edmund H. Linfield.
- 12:45 RAPID DETECTION OF CELL ACTIVATION, Hemendra Ghimire*, A. U. Perera, Jitto Titus, Chadi Filfili and Julia K. Hillard.
- 1:00 THE EFFECT OF TEMPERATURE AND HUMIDITY ON THE ELECTRICAL RESISTANCE OF ZIRCONIUM DIOXIDE NANO-PARTICLES**, Austin Duke* and Ben DeMayo.
- 1:15 MODELING TEMPERATURE CHANGE OF A COMPUTER COMPONENT USING AN RLC CIRCUIT**, Kelly S Ford* and Javier E. Hasbun.
- 1:30 OPTICAL PROPERTIES OF ALQ₃ AND TiO₂ MULTI LAYERS PROCESSED BY SPIN COATING**, Sarahn, Nazaret*, Amber Ethridge* and L. Ajith DeSilva.

- 1:45 BOROSILICATE GLASS AS A CARRIER FOR NANOCERIA**, Adam L. Quinn* Kisa Ranasinghe and Rajnish Singh.
- 2:00 SUPPLEMENTAL INSTRUCTION IN CLASSICAL MECHANICS USING COMPUTATION**, Justin Hill* and Javier E. Hasbun.
- 2:15 GAP CAPACITANCE VERSUS INTERDIGITAL CAPACITANCE, Christopher J. Ferguson and Arun K. Saha.
- 2:30 RESONANCE REPULSION IN A COUPLED TORSIONAL OSCILLATOR, William Reeves and Tom Colbert.
- 2:45 **Break**
- 3:00 APPLICATION OF TUNGSTEN (W) ATTENUATORS FOR THE REDUCTION OF DOWNSCATTER PHOTONS IN DUAL-ISOTOPE SIMULTANEOUS-ACQUISITION NUCLEAR CARDIOLOGY IMAGING**, Steven A Garner* and Gregory G. Passmore.
- 3:15 MOLECULAR ORGANIZATION IN CELL MEMBRANES**, Austin S. Osby* and Theja N DeSilva.
- 3:30 NESHAP AREA-SPECIFIC DOSE-RELEASE FACTORS FOR POTENTIAL ONSITE MAXIMALLY EXPOSED INDIVIDUAL LOCATIONS USING CAP88-PC VERSION 4.0, Pauline N. Trimor* and Joseph Newton.
- 3:45 BENCHMARKING OF SRNL ENVIRONMENTAL DOSIMETRY CODES TO GENII VERSION 2.10.1, Evaleigh S. Bell* and Joseph Newton.
- 4:00 GENERATION OF IMMUNOLIPOSOMES USING MICROFLUIDIC DEVICES**, Meaghan Lawrence* and Josefa Guerrero Millan.
- 4:15 THE TORSIONAL OSCILLATION MODEL OF T-SHAPED CYANOACETYLENE CARBON DIOXIDE DIMER COMPLEX, HCCCN ... CO₂, Bingbing Li* and Lu Kang.
- 4:30 THEORY OF MULTI-BAND INDIRECT K-EDGE BIMAGNON RIXS, Sean Mongan* and Trinanjan Datta.
- 4:45 UNDERSTANDING MECHANICS WITH APPLICATIONS IN MATLAB/OCTAVE THROUGH PEER-LED WORKSHOPS**, Charles A. Zander* and Javier E. Hasbun.

Posters (on display 5:00–6:00 pm, Classrooms 001-003, EC)

FRIDAY POSTER PRESENTATIONS

Classrooms 001-003, Education Center (EC)

5:00 pm –6:00 pm

Section I Posters: Biological Sciences

ARE THE eIF2- α HOMOLOGUE AND PUTATIVE TYROSINE KINASE PROTEINS OF RANAVIRUSES SUITABLE TARGETS FOR PHYLOGENETIC RECONSTRUCTION? Ami J. Davis*, Justin D. Serna*, and Amanda L. J. Duffus

POLLEN SIZE AS AN INDICATOR OF PLOIDY LEVEL IN RHEXIA, A SMALL GENUS OF FLOWERING PLANTS ENDEMIC TO THE NORTH AMERICAN COASTAL PLAIN, IN NORTH FLORIDA AND COASTAL GEORGIA**, Autumn L. Czander* and M. Raine Foulkes*

FIRST CHROMOSOME NUMBER DETERMINATIONS IN UTRICULARIA FLORIDANA, THE FLORIDA YELLOW BLADDERWORT, A CARNIVOROUS AQUATIC PLANT ENDEMIC TO THE SOUTHEASTERN UNITED STATES. **, Zachary William Izen* and Corene DePhillips*

EVOLUTION OF ANTI-PREDATORY BEHAVIOR AMONG CAROLINA CHICKADEES (POECILE CAROLINESIS) IN RESPONSE TO A NOVEL PREDATOR, THE HOUSE WREN (TROGLODYTES AEDEON)** , Lex Dunn*, James Lindley McKay, Lucy Maleni Aviña*, and Olga Milenkaya

POPULATION-LEVEL RESPONSE OF CAROLINA CHICKADEES TO THE EXPANSION OF HOUSE WRENS IN APPALACHIAN GEORGIA**, Maximillian Marvin Muldoon* and Olga Milenkaya

POLYPLOIDY AND GENOMIC VARIATION IN NORTHERN FLORIDA AND COASTAL GEORGIA POPULATIONS OF RHEXIA, A SMALL GENUS OF FLOWERING WETLAND PLANTS ENDEMIC TO THE NORTH AMERICAN COASTAL PLAIN**, Corene DePhillips*, M. Raine Foulkes*, Autumn Czander*, and Zachary W. Izen*

ARE PARTIAL MAJOR CAPSID PROTEIN AND eIF2- α SEQUENCES ENOUGH TO DETECT RECOMBINATION IN UK RANAVIRUS ISOLATES? Leigha M. Henson*, Kuttichantran Subramanian, Amanda L. J. Duffus, and Thomas B. Waltzek

IS THE MYRISTILATED MEMBRANE PROTEIN OF RANAVIRUSES AN ACCEPTABLE ALTERNATIVE FOR PHYLOGENETIC ANALYSIS?**, Riley B. Fuller* and Amanda L.J. Duffus

VALIDATION OF ESTIMATED SICKLEFIN REDHORSE GROWTH FROM PECTORAL FIN RAYS USING RECAPTURED INDIVIDUALS, Kaylyn Crossley* and Johnathan G. Davis

SOLAR ECLIPSE HAS NO DISCERNIBLE EFFECT ON BAT ACTIVITY, Sara A. Robertson* and Michael J. Bender

CORAL HOST PREFERENCES OF CHRISTMAS TREE WORMS, SPIROBRANCHUS GIGANTEUS, IN CALABASH CAYE, BELIZE, Madeleine S. Wagner*, Katelyn P. Yeakley*, Nancy E. Dalman, and Jill G. Schulze

ROLE OF PHOSPHATASES IN OLFACTORY SIGNALING IN MITRAL CELLS**, Melissa Cavallin Johnson, Carlos Cano*, Kim Loberbaum-Fears*, Adam Wharton*, and Thomas Parks*

EXPRESSION LEVELS OF VASA, PAX-1 LIKE INTERACTING, AND GERANYL-GERANYL TRANSFERASE ACROSS DEVELOPMENTAL STAGES OF THE WASP COPIDOSOMA FLORIDANUM**, Rafael Hernandez* and Margaret S. Smith

BADGE COLOR AFFECTS RATE OF ATTACK UPON MALE FENCE LIZARDS, SCELOPORUS UNDULATUS, Amelia A. Daniel*, Michael J. Bender, and Gregory D. Hartman

THE IMPACTS OF NITRATES ON MILLIPEDE WEIGHT, MAINTANANCE, AND BEHAVIOUR**, Christina Cortes*, M. Cole Brogden*, Allison Rick VandeVoort*, and Bruce A. Snyder

INSECT SUCCESSION ON CARRION: AN INTRODUCTION TO FORENSIC ENTOMOLOGY, Bayli Peoples* and Greg Payne

PARENTAL ANTI-PREDATORY BEHAVIOR OF CAROLINA CHICKADEES (POECILE CAROLINENSIS) BASED ON CLUTCH SIZE MANIPULATION**, Lucy Maleni Aviña*, James Lindley McKay, Lex Dunn*, and Olga Milenkaya

VARIATION IN STRUCTURAL NEST PROPERTIES AND THEIR EFFECTS ON REPRODUCTIVE SUCCESS IN CAROLINA CHICKADEES**, Eryn Elysabeth Cochran*, James Lindley McKay, Lucy Maleni Aviña*, Lex Dunn*, and Olga Milenkaya

LABORATORY EVALUATION OF SELECTED INSECTICIDES ON FIELD-COLLECTED POPULATIONS OF BOLLWORM AND TOBACCO BUDWORM LARVAE-2017-UPDATE, Emily Adams* and Greg Payne

INTEGRATED SPECIES DELIMITATION OF THE RINGNECK SNAKE DIADOPHIS PUNCTATUS IN A BIODIVERSITY HOTSPOT**, Polly Strott* and Frank M. Fontanella

SURVEY OF INSECT AVAILABILITY FOR FORAGING BATS IN THE SHOAL CREEK DISTRICT OF ALABAMA'S TALLADEGA NATIONAL FOREST, Justin Dover* and Greg Payne

SHORT TERM EFFECTS OF HURRICANE IRMA ON THE PHYTOPLANKTON OF LAKE LOUISE, GEORGIA**, Marque'l K. Gould*, Adam J. Nienow, and James A. Nienow

THE EFFECT OF SLEEP EXTENSION ON PHYSICAL PERFORMANCE IN COLLEGIATE ATHLETES, Katie Sills* and Helene Peters

ANALYSIS OF THE DEOXYNUCLEOSIDE KINASE GENE FROM RANAVIRUS GENOMES SUGGESTS A NEW MODEL FOR PHYLOGENETIC STUDY, Amanda D. Mileham* and Amanda L.J. Duffus

SURVEY OF NATIVE AND NON-NATIVE BIVALVE SPECIES IN BOCAS DEL TORO, PANAMA**, John T. Sparks Jr.* and Yvette L. Garner

SOIL NITRIFICATION ANALYSIS AND MILLIPEDE CONTRIBUTION**, M. Cole Brogden*, Christina Cortes*, Allison Rick VandeVoort*, and Bruce A. Snyder

EFFECTS OF SUBLETHAL EXPOSURE TO GLYPHOSATE ON SWIMMING AND FEEDING BEHAVIOR IN KILLIFISH, *Fundulus heteroclitus*, J. Baxter*, T. Hernandez*, A. Shirley*, K. Maze*, and N. E. Dalman.

Section II Posters: Chemistry

ENZYME-CATALYZED HENRY REACTION. Anne C. Gaquere-Parker.

THE USE OF CYCLIC VOLTAMMETRY FOR THE EVALUATION OF ANTIOXIDANT CAPACITY. Catherine Fairchild*, Andre Jackson*, and Victoria Geisler.

THE PH DEPENDENCE OF THE EXCITATION AND EMISSION SPECTRA OF UMBELLIFERONE**. Nia Keyes*, Abigail Schwartz*, and Donna L. Gosnell.

SYNTHESIS AND CHARACTERIZATION OF BIODIESEL FROM WASTE OIL AND GREASE AND CHARACTERIZATION OF ITS COMBUSTION EXHAUST WHEN USED AS FUEL**. Matthew Derosa*, Anirudh Veludhandi*, Neelam Khan, Seungjin Lee, Sang H. Park, David P. Pursell, and Kathryn Zimmermann.

SYNTHESIS AND CHARACTERIZATION OF CARBOXYLATE COMPLEXES OF LANTHANIDE (III) IONS**. Zewdu Gebeyehu and Charles E. Milliron.

SYNTHESES AND CRYSTAL STRUCTURES OF POTASSIUM SALTS OF 3-NITROPHENOL AND 4-NITROPHENOL, Paula A. Kahn and Kenneth L. Martin.

Section III Posters: Earth and Atmospheric Sciences

COMPARING WETLAND SOIL PROPERTIES USING IRIS TUBES, Alexander J. Morley*, Samuel Long*, Cameron Skinner*, Samuel Mutiti, Christine Mutiti, and Allison VandeVoort

SPATIAL ANALYSIS AND TRANSPORT OF PHOSPHATE AT BABE AND SAGE FARM SOILS**. Zachary Stephen Bond and Allison VandeVoort

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

ABUNDANCES AND IONIZATION EQUILIBRIUM SOLUTIONS OF BROMINE, RUBIDIUM, AND XENON IN ASTROPHYSICAL NEBULAE**, Briana T. Lewis-Marshall*, Nicolas C. Sterling, Ryan L. Porter*, John E. Harrison*, Courtney L. Spencer*.

THREE-DIMENSIONAL ELASTICITY OF A RUBBERBAND**, Auric Saha* and K. C. Chan.

DETERMINING BLADE PARAMETERS FOR OPTIMIZED WIND TURBINE BLADES**, Josiah Donn*, Ratnapuli L. Kulasiri.

COSMIC RAY MUON RATE MEASUREMENTS AT KSU**, Anthony Niebank*, and Ratnapuli L. Kulasiri.

NOVEL APPLICATION OF ZINC OXIDE NANOWIRE IN SOLAR CELLS**, Thomas G. Salazar*, Janeses Bibbs and Liqiu Zheng.

PHOTOLUMINESCENCE OF INP/ZNS NANOCRYSTALS UNDER PRESSURE**, Tyler S. Young*, G. Neal Chesnut and L. Ajith DeSilva.

FIXING STOICHIOMETRY OF CUI FOR CONTROLLED MEASUREMENTS OF SEMICONDUCTING PROPERTIES**, Nicole Morris*, Joshua Harwell*, L. Ajith DeSilva, and K. Tennakone.

BRAGG MIRROR BASED ON ALQ₃/TiO₂ MULTILAYERS**, Amber Ethridge*, Sarah Nazaret*, L. Ajith DeSilva, and Theja N. De Silva.

THE EFFECT OF THE HUBBLE CONSTANT AND ENERGY INDICES α AND β ON THE MEASURED GRBS REDSHIFT DISTRIBUTION**, Cecilia Ratke*, Truong Le.

APPLYING PERCOLATION METHOD OF GALAXY FORMATION TO 3-DIMENSIONS AND DIFFERING VELOCITY CURVES FOR SHEER**, Jared M. Mooney*, Truong Le.

JETS LAUNCHING RAIDUS IN LOW-POWERED RADIO-LOUD AGNS IN ADVECTION-DOMINATED ACCRETION FLOWS**, William T. Newman*, Truong Le.

Section V Posters: Biomedical Sciences

OPTIMIZING GOAT SKIN FIBROBLAST CULTURE CONDITIONS FOR CLONING, Aakash Arora* and Mahipal Singh.

A COMPARISON OF THE EFFECTS OF CIGARETTE SMOKE CONDENSATE AND E-CIGARETTE VAPOR OIL SOLUTIONS (WITH OR WITHOUT NICOTINE) ON THE ARYL HYDROCARBON RECEPTOR IN HUMAN LIVER HEPG2 CELLS, Rachel V. Benson* and Jennifer C. Schroeder.

EFFECTS OF EXPOSURE TO LEAD (Pb) AND OTHER DIVALENT CATIONS ON NEUROMASTS OF THE POSTERIOR LATERAL LINE IN EMBRYONIC ZEBRAFISH**, Arielle L. Charles*, Rachel C. Lepine*, and Linda G. Jones.

EFFECTS OF EXPOSURE TO LIGHT OR DARK AND VITAMIN D ON ACTIVATION OF MAP KINASE IN JUVENILE ZEBRAFISH**, Ashlee M. Franji* and Linda G. Jones.

INCREASE OF AHR ACTIVITY BY OMEPRAZOLE CAN BE REDUCED IN THE PRESENCE OF RESVERATROL OR QUERCETIN, Ana E. Galdamez* and Jennifer C. Schroeder.

THE INDUCTION OF GENTAMICIN RESISTANCE IN *PSEUDOMONAS AERUGINOSA* THROUGH REPEATED EXPOSURE, Ashley N. Hayman* and Paul T. Arnold.

THE ROLE OF THE ENDOCANNABINOID SYSTEM DURING ZEBRAFISH DEVELOPMENT**, Sara K. Jorgensen* and Linda G. Jones.

INHIBITING CELL SURVIVAL OF OBESITY-RELATED CANCER WITH LEPTIN ANTAGONISTS, Crystal C. Lipsey*, Adriana Harbuzariu, and Ruben R. Gonzalez-Perez.

DETERMINGING THE BINDING SITE OF ADENOVIRUS E4 11K TO CELLULAR DDX6**, Kathryn E. McGraw*, Courtney F. Moon*, and Kasey A. Karen.

LOCALIZATION OF P-BODY PROTEINS DURING ADENOVIRUS 5 INFECTION**, Garrett H. Medley*, Emilee M. Friedman*, and Kasey A. Karen.

EFFECTS OF TYPE 1 DIABETES ON THE COMPOSITION OF THE ORAL AND GUT MICROBIOMES**, Meghan N. Tonnesen* and R. Drew Sieg.

EFFECTS OF MENSTRUAL CYCLE AND BIOFLAVONOID CONSUMPTION ON CIRCADIAN RHYTHM **, Trista R. Twiford*, Kelsy R. Hice*, and Jennifer C. Schroeder.

Section VII Posters: Science Education

IMPACTS OF A FIELD-BASED, INTERDISCIPLINARY STUDY ABROAD PROGRAM IN BELIZE ON STUDENT LEARNING AT THE UNIVERSITY OF WEST GEORGIA**
Randi Barney*, Yvette L. Garner, and Naomi Stuesser

THE SIGNIFIGANCE OF THE STUDY OF EVOLUTION: DEVELOPMENT AND IMPLEMENTATION OF AN INTERACTIVE COURSE MODULE: PHASE II**
Cynthia Lynn Wilson¹, Nilabhra M. Sanyal², Alisha Wise¹, and Soma Mukhopadhyay¹

IMPLEMENTING A FLIPPED LEARNING ENVIRONMENT IN GENERAL BIOLOGY
1**, Kathleen S. Hughes

DEVELOPMENT OF A COST EFFECTIVE FLOW CELL COLORIMETER KINETICS LABORATORY, Jack Orchard, Jeremy Cooper, and Jim Konzelman

Section VIII Posters: Anthropology

COLLAPSE ON THE ANDEAN FRONTIER: EFFECT OF STATE FRAGMENTATION ON PRODUCTION AND EXCHANGE ** on Production and Exchange **, Zachary Michael Spiezio*

DIGGING DEEP WITH A PHOTON SHOVEL: ELEMENTAL ANALYSIS OF ANCIENT ANDEAN CERAMICS, Robert Paul Theberge*

ELLIPICAL FOURIER ANALYSIS OF MANDIBULAR FIRST MOLAR OCCLUSAL OUTLINES FROM THE LATE NEOLITHIC OF BELIGUM, Frank L'Engle Williams and Katherine M. Lane*

SATURDAY PAPER PRESENTATIONS

***Denotes student presenter**

****Denotes student research in progress**

Section I: Biological Sciences

Classroom 005, Education Center (EC)

Margaret Smith, Presiding

- 9:00 BASELINE WATER MONITORING OF THE OHOOPEE RIVER, John M. Sanders*, Johnathan Davis*, Kaitlin Warren, Jen Hillburn, and David Chevalier
- 9:15 EVALUATION OF THE EFFECT OF SEPTIC SYSTEMS OF NITROGEN AND PHOSPHORUS LOADING IN CHATUGE RESERVOIR, Caroline Elizabeth Cox* and Johnathan G. Davis
- 9:30 ONE-HEALTH BIOSURVEILLANCE FOR BLOOD-FEEDING PHLEBOTOMINE FLIES AS POTENTIAL DISEASE VECTORS IN NORTHWEST GEORGIA, USA, Jared Brumbelow*, Anna Claire Tucker*, and David Bruce Conn
- 9:45 BIOSURVEILLANCE FOR MOSQUITOES AS POTENTIAL DISEASE VECTORS IN NORTHWEST GEORGIA USA: A ONE-HEALTH APPROACH, Anna Claire Tucker*, Jared Brumbelow*, and David Bruce Conn
- 10:00 **Break and Section Business Meeting**

Section II: Chemistry

Classroom 003, Education Center (EC)

Samuel Abegaz Presiding

- 8:30 CHARGE DENSITY EFFECTS ON MEMBRANE POTENTIAL AND SIZING DSPC LIPOSOMES**, R. Kelly Brumbelow II* and Josefa Guerrero Millan.
- 8:45 SYNTHESIS AND ANTI-PROLIFERATIVE ACTIVITY OF N,N'-BIS-SUBSTITUTED -2,4-TRIAZOLIUM SALTS WITH VARIOUS SUBSTITUENTS, ZiJie Lin, Camila Cardenas, Jared Bies, Jacqueline Strickland, John D. Gorden, Monica Frazier, Jonathan M. Meyers, and Kerri L. Shelton.
- 9:00 EFFECTS OF STRUCTURE ON RADICAL-SCAVENGING ABILITY OF PHENOLS, Jacob Sudduth and Victoria Geisler.
- 9:15 EXPLORATION OF BINDING SELECTIVITIES OF CUCURBIT[N]URILS WITH ALKALI METAL IONS VIA ESI-MS, Abigail Patanao*, Mailei Zhang-Smith*, Nicholas Scafidi*, and Andrew Sennett*
- 9:30 Withdrawn
- 9:45 LINEAR DICHROISM IN THE UNDERGRADUATE PHYSICAL CHEMISTRY LAB**, Donna L. Gosnell

10:00 **Break and Section Business Meeting**

Section III: Earth and Atmospheric Sciences

Classroom 002, Education Center (EC)

Mark Groszos, Presiding

9:30 DEVELOPING METHODS FOR QUANTIFYING IRIS TUBE DATA, Samuel Long*, Alexander Morley*, Cameron Skinner*, Christine Mutiti, Samuel Mutiti, and Allison VandeVoort.

10:00 **Break and Section Business Meeting**

Section IV: Physics, Mathematics, Computer Science, and Technology

Classroom 004, Education Center (EC)

L. Ajith DeSilva, Presiding

8:00 PROTECTING LOCAL STUDENTS: IDENTIFYING UNSAFE SOLAR ECLIPSE SHADES, Ben Jenkins, Stephen Ramsden and Bob Powell.

8:15 THE BRIGHTNESS OF MERCURY IN THE NEAR INFRARED (J AND H FILTERS), Richard W. Schmude, Jr.

8:30 WIDEBAND ULTRAVIOLET BRIGHTNESS MEASUREMENTS OF THE PLANET URANUS, Richard W. Schmude, Jr.

8:45 EARLY COURSE PERFORMANCE ALERTS INCREASE PERCENTAGE OF PASSING GRADES IN RETENTION CHALLENGED TECHNOLOGY AND MATH INTENSIVE ONLINE COURSES, Ulrike G. Lahaise.

9:00 ATTENUATION OF GROUND-BORNE BUILDING VIBRATIONS BY PARTICULATE MEDIA AT THE AUDIBLE FREQUENCIES, Hasson M. Tavossi.

9:15 THINKING THROUGH THE MODEL, D G Sumith P. Doluweera.

9:30 PHOTOSENSITIVE PLANTS AND THE TOTAL SOLAR ECLIPSE ON AUGUST 21, 2017, Bob Powell, James Hembree and Ben Jenkins.

9:45 BOB POWELL, A PHYSICIST, RECOGNIZING 50-YEAR OF SERVICE TO GEORGIA ACADEMY OF SCIENCE, L. Ajith DeSilva.

10:00 **Break and Section Business Meeting**

10:30 THEORETICAL DISCOVERY OF A NOVEL EMERGING SUPERCONDUCTING STATE, Theja N. DeSilva.

10:45 CAN RECENTLY DISCOVERED JAHN TELLER METALLIC PHASE BE SUPERCONDUCTING? Theja N. DeSilva.

11:00 THE USE OF THE EULER-CROMER NUMERICAL METHOD IN CLASSICAL MECHANICS, Javier E. Hasbun.

11:15 ATMOSPHERIC PRESSURE VARIATIONS IN THE NORTH GEORGIA MOUNTAINS, Bob Powell and Ben Jenkins.

- 11:30 OUTREACH BEFORE AND DURING THE GREAT AMERICAN SOLAR ECLIPSE, Bob Powell and Ben Jenkins.
- 11:45 Withdrawn

Section V: Biomedical Sciences
Classroom 226, Education Center (EC)
Jennifer Schroeder, Presiding

- 9:00 EFFECTS OF TURF BEAD EXTRACT ON AHR ACTIVITY IN HUMAN LIVER CELLS IN THE PRESENCE AND ABSENCE OF RESVERATROL AND QUEECETIN**, Hilda Yazmin Ramos*, Rachel M. Perusse*, and Jennifer C Schroeder.
- 9:15 INVESTIGATION OF ANTIBACTERIAL EFFECTS OF SOUTHERN APPALACHIAN PLANTS: *PHYTOLACCA AMERICANA* AND *JUGLANS NIGRA* ON SELECTED BACTERIA **, Nathan A. Barnes* and Paul T. Arnold.
- 9:30 EFFECTS OF RESVERATROL CONCENTRATIONS ON THE ARYL HYDROCARBON RECEPTOR IN THE PRESENCE OF INDIGO DYE OR BENZO[A]PYRENE IN HUMAN LIVER CELLS, Cassidy A. Starling* and Jennifer C. Schroeder.
- 9:45 ACTIVATION OF MAP KINASES IN RESPONSE TO OXIDATIVE STRESS IN EMBRYONIC ZEBRAFISH**, Karly M. Zacharias* and Linda G. Jones.
- 10:00 **Break and Section Business Meeting**

Section VI: Philosophy and History of Science
Classroom 001, Education Center (EC)
Charmayne E. Patterson, Presiding

- 9:00 THE ROLE OF LIBRARIANS IN THE CREATION AND DISSEMINATION OF SCIENTIFIC KNOWLEDGE**. Ronald E. Mickens Ph.D., Bryan A. Briones, and Imani K. Beverly
- 9:30 THE REASONS (SOMETIMES) FOR A CHANGE OF MIND, Imani Beverly and Ronald E. Mickens
- 10:00 **Break and Section Business Meeting**
- 10:30 UNKNOWN, NOT HIDDEN FIGURES IN SCIENCE: THE ROLE OF INVISIBLE COLLEGES, Ronald E. Mickens and Charmayne Patterson
- 11:00 SPELMAN COLLEGE, A NATIONAL LEADER IN THE ORIGIN OF BACCALAUREATE DEGREE GRADUATES WHO EARN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) GRADUATE DEGREES. Albert N. Thompson Jr.

Section VII: Science Education
Classroom 225, Education Center (EC)
Peter Roessle, Presiding

- 9:00 AR PHYSICS EDUCATION. K.C. Chan
9:30 PROJECT-BASED LEARNING: LEARNING THROUGH GUIDED CLASS PROJECTS IN AN UPPER LEVEL SPECIAL TOPICS CLASS, Tolulope O. Salami
10:00 **Break and Section Business Meeting**

Section VIII: Anthropology
Classroom 229, Education Center (EC)
Alice Gooding, Presiding

- 8:45 JUNCTIONS AND DISJUNCTIONS BETWEEN TRADITIONAL PASHTUN BIRTH PRACTICES AND MODERN MEDICINE**, Krystallyn Keith*
9:00 SLEEP LOSS AS A CULTURAL SYNDROME, Stephanie Duncan*
9:15 THE ROLE OF SOCIOECONOMIC STATUS IN THE LIVES OF PATIENTS WITH ATTENTION DEFICIT DISORDER**, Hannah Elicker*
9:30 SAPELO VOICES REVISITED: ON THE IMPORTANCE OF COMMUNITY-DRIVEN PROJECTS**, William A. Schulz*
9:45 A TYPOLOGY AND ANALYSIS OF MIDDLE WOODLAND PROJECTILE POINTS AND OTHER LITHICS RECOVERED FROM THE LOWER DABBS SITE IN NORTH GEORGIA**, William R. Heflin*
10:00 **Break and Section Business Meeting**
10:30 ARCHAEOLOGICAL METAL DETECTION AT PICKETS MILL BATTLEFIELD, Michael D. McClung
10:45 ERROR IN SEX ESTIMATION METHODS FURTHER COMPOUNDS IDENTITY ISSUES IN FORENSIC ANTHROPOLOGY **, Jessica P. Daniels
11:00 GENDER DIFFERENCES IN THE HEALTH BENEFITS OF A BICYCLE-PEDESTRIAN TRAIL, Lisa L. Gezon, Anne Kristen Hunter, and Emily McKendry-Smith

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

By-Laws: http://www.gaacademy.org/GAS_Bylaws_2016.pdf

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