

2019

Georgia Academy of Science, University of North Georgia, March 15th-16th, 2019

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GEORGIA ACADEMY OF SCIENCE

ANNUAL MEETING

MARCH 15TH-16TH, 2019

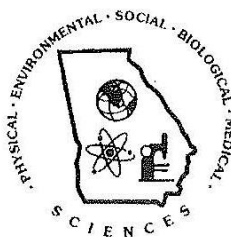
UNIVERSITY OF NORTH GEORGIA

PROGRAM

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THE GEORGIA ACADEMY OF SCIENCE

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

15 March 2019

Dear Colleagues of the Academy,

Welcome to the University of North Georgia, Gainesville Campus for our 2019 Georgia Academy of Science meeting! I am very appreciative of the Science Faculty and Administration of UNG for all of their hard work in their preparations and hosting of this meeting. I especially want to thank the Local Arrangements Committee, under the direction of Dr. Clarke Miller and Dr. Carl Ohrenberg for paving the way for another very successful meeting. I am also grateful to the GAS Council and Committees for a good year leading up to this meeting. At the end of this meeting I will complete my term as President of GAS and “pass the gavel” into the very capable hands of Dr. Mark Davis of UNG. I believe that he will serve the Academy well!!

The GAS Annual Meeting continues to celebrate the achievements of the scientific community of our great State, and it is very important that we, as members of the Academy, continue to be ambassadors toward that cause. Please encourage others to join the Academy as we seek to increase our membership and participating colleges & universities throughout the state of Georgia. It is very important that Georgia Academy of Science continues to champion the cause of undergraduate and graduate research among students as they move on into their respective professions, and to contribute to the greater scientific literacy of the citizens of our state.

Thank you for being the life’s blood of the Academy, and enjoy the meeting!!!

Sincerely,

A handwritten signature in black ink that reads 'Paul T. Arnold'. The signature is written in a cursive style with a large, sweeping 'P' and 'A'.

Paul T. Arnold
President, Georgia Academy of Science



Welcome, Georgia Academy of Science Members!

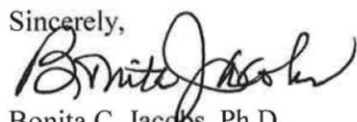
The University of North Georgia is honored to host the 2019 Georgia Academy of Science Annual Meeting! UNG is a leading regional university with great momentum, and we are excited to share the amazing work that is being done by our faculty, staff, and students.

- UNG's enrollment has grown by 45% since 2012, and we serve nearly 20,000 students across five campuses and online, making us a driving force for educational attainment and economic development.
- We attract a very talented and ambitious pool of students, and I am very proud that we have helped students earn prestigious, nationally competitive awards and honors from the Goldwater program, the National Institutes of Health, the U.S. Department of Energy, National Institute of Standards and Technology, and the Woodrow Wilson STEM Teaching Fellowship, among others. In 2018, UNG was named a national top-producer of Fulbright students (we have 13 Fulbright semifinalists this year and anticipate great news from this group!).
- Undergraduate research at UNG has been a long-standing instructional practice, and our basic and applied research initiatives are growing rapidly. Our grants and contracts have nearly doubled in the past five years and total more than \$5.7 million annually.
- UNG is a Center of Academic Excellence in Geospatial Sciences and in Cyber Education, which highlights two fast-growing, specialized programs that are producing great results, such as placing in the top three schools in the nation, out of 377 competitors, in the recent National Security Agency Codebreaker Challenge.
- One of only six senior military colleges in the country, UNG holds unique designations as a State Leadership Institution and as The Military College of Georgia. With more than 750 students in our Corps of Cadets, we are a top-producer of officers for the U.S. Army and the Georgia Army National Guard.

Our world-class faculty and staff inspire service, inquiry, and creativity, and the achievements of our students are our greatest measure of success. I am honored to serve as president of such a dynamic university that is helping students fulfill their potential.

Again, welcome to UNG! I invite you to learn more about what makes this such a special institution, and I hope you have a wonderful meeting.

Sincerely,



Bonita C. Jacobs, Ph.D.
President

University of North Georgia Campus, 3820 Mundy Mill Rd, Oakwood, GA



GAS 2019 PROGRAM
Friday, March 15, 2019

- 10:00 am to 6:00 pm: On-site registration.....Martha T. Nesbitt Building,
.....Main Lobby
- 11:30 am to 1:00 pm: Georgia Academy of Science Board of Directors business meeting
(closed to the public).....Nesbitt, Room 3201
- 12:30 pm to 4:45 pm: Section IV: Oral session, PHYSICS, MATHEMATICS,
COMPUTER SCIENCE, ENGINEERING, AND TECHNOLOGY
.....Nesbitt, Room 4105
- 1:45 pm to 4:45 pm: Section I: Oral session, BIOLOGICAL SCIENCES
.....Nesbitt, Room 3101
- 4:00 pm to 6:00 pm: Poster presentations.....Student Center, Robinson Ballroom
- 4:00 pm to 6:00 pm: Refreshments.....Student Center, Main Lobby
- 6:00 pm to 6:15 pm: Opening remarks by Dr. Paul Arnold.....Student Center,
.....Robinson Ballroom
- 7:00 pm: After-hours social gathering.....(Info available at Registration)
..... 2100 Atlanta Hwy, Gainesville

Saturday, March 16, 2019

- 7:30 am to 10:00 am: Light breakfast.....Martha T. Nesbitt Building,
.....Main Lobby
- 7:30 am to 10:00 am: On-site registration.....Nesbitt, Main Lobby
- 8:00 am to 12:00 pm: Oral sessions/Section business meetings
- 7:45 Section I: BIOLOGICAL SCIENCES.....Nesbitt, Room 3101
- Section II: CHEMISTRY.....Nesbitt, Room 3108
- Section III: EARTH AND ATMOSPHERIC SCIENCES.....Nesbitt, Room 3103
- Section IV: PHYSICS, MATHEMATICS, COMPUTER SCIENCE, ENGINEERING
AND TECHNOLOGY.....Nesbitt, Room 4105
- Section V: BIOMEDICAL SCIENCES.....Nesbitt, Room 3104
- Section VI: PHILOSOPHY AND HISTORY OF SCIENCE.....Nesbitt, Room 3105
- Section VII: SCIENCE EDUCATION.....Nesbitt, Room 3106
- Section VIII: ANTHROPOLOGY.....Nesbitt, Room 3107
- 12:15 pm to 1:45 pm: Lunch, Keynote speaker, Student awards, and Academy Business
Meeting.....Nesbitt, 3110 - Cleveland Ballroom

Geospatial Technologies and Augmented Reality Spark Excitement in Science Education, Research and Outreach

Marguerite Madden and Sergio Bernardes

While we sense and learn about our environment in multiple dimensions, traditional materials used in science education, research and outreach continue to rely predominantly on 2-D displays of data, maps, photographs, and conceptual diagrams. Advances in geospatial technologies, combined with emerging visualization techniques borrowed from gaming, can spark excitement, foster engagement, and create active learning environments. The “Wow” factor is real and science engagement in preschoolers to retirees is critical in our current climate of *big data* and scientific skepticism. Beyond the basic requirement for scientifically informed decision makers, methods for conveying the beauty and wonder of science are key. Researchers at the Center for Geospatial Research within the Department of Geography at the University of Georgia are using geospatial technologies such as unmanned aerial systems (UAS), virtual and augmented reality devices, and multidimensional geovisualization techniques to create a 3D immersion and geovisualization (3DIG) system for education, outreach, and research. Combining data acquisition with structure from motion (SfM) photogrammetric analysis, image processing, geospatial query, and fundamental principles of cartographic display, a powerful set of interactive and immersive initiatives were developed for landscape-scale applications. Specifically, the 3DIG system consists of 1) low cost UAS image data collection and processing to create detailed image mosaics and 3D landscape models; 2) 3D modeling of real surfaces with interactive tangible landscapes (i.e., augmented reality sandboxes); 3) immersive experiences with virtual and augmented reality goggles and environments; and 4) large format display of high definition and multidimensional content using a multiscreen video wall. This presentation will highlight case studies using 3DIG, including assessing coastal hurricane impacts, monitoring small farm crops, GPS tracking of human-elephant conflicts in Zimbabwe, and community-based online story mapping of African American history in Athens, Georgia. Discussion will include the advantages and drawbacks of combining emerging geospatial technologies with human interpretations as we bring our life experiences, perceptions and values to our computer screens.

Dr. Marguerite Madden is a Professor in the University of Georgia Department of Geography and Director of the Center for Geospatial Research (CGR) (cgr.uga.edu) where faculty, staff and students have collaborated on environmental research projects using remote sensing and geographic information systems (GIS) since the mid-1980s. Dr. Madden’s research interests include the application of GIScience to landscape-scale processes and human-animal-environment interactions. She is a Fellow and Past President of the American Society for Photogrammetry and Remote Sensing (ASPRS) and Editor of the ASPRS *Manual of GIS* (2009). She also served as the International Society for Photogrammetry and Remote Sensing (ISPRS) Technical Commission President for Commission IV, “Digital Mapping and Geodatabases” (2008-2012) and the ISPRS Council Second Vice President (2012-2016). She earned B.A. and M.A. degrees in Biology from the State University of New York and Ph.D. in Ecology from the University of Georgia.

FRIDAY PAPER PRESENTATIONS

*Denotes student presenter

** Denotes student research in progress

Section I: Biological Sciences

Room 3101, Nesbitt Building

Margaret Smith, Presiding

- 1:45 PATTERNS IN THE IMPERILMENT OF NATIVE FRESHWATER FISHES OF GEORGIA, Mark Howington*, Caroline Cox*, and Darrien Henson*
- 2:00 SPAWNING MIGRATION PATTERNS OF SICKLEFIN REDHORSE IN BRASSTOWN CREEK**, Caroline E. Cox* and Johnathan G. Davis
- 2:15 EFFECTS OF PLEISTOCENE CLIMATIC FLUCTUATIONS ON THE PHYLOGEOGRAPHY AND DEMOGRAPHIC HISTORY OF THE PATENT LEATHER BEETLE *ODONTOTAENIUS DISJUNCTUS***, Taylor S. Procter* and Frank Fontanella
- 2:30 ASSESSING THE GENETIC DIVERSITY OF INVASIVE TILAPIA INFILTRATING HAWAIIAN STREAMS, Jordan L. Yacoub* and Caroline Fowler*
- 2:45 NATIVE POPULATION IS MALADAPTED IN COMPETING WITH INVASIVE SPECIES, BUT INTRASPECIFIC VARIATION SUGGESTS CHANGING BEHAVIOR, Aubrey P. Crowell*, J. Lindley McKay, Kaveh Eden*, and Olga Milenkaya
- 3:00 DORSAL SCUTE AND GROWTH DEVELOPMENT IN *ACIPENSER FULVESCENS* IN DIFFERENT ENVIRONMENTAL CALCIUM CONCENTRATIONS**, Rachael N. Hicks* and Janet Genz
- 3:15 **Break**
- 3:30 HOME RANGE AND HABITAT USE OF THE EASTERN BOX TURTLE (*TERRAPENE CAROLINA*) IN THE NORTH GEORGIA PIEDMONT**, Amber L. Rittgers*, Samantha A. Shea*, and Kayla Bonadie*
- 3:45 CHARACTERIZATION AND EVOLUTION OF GTPASES OF IMMUNITY ASSOCIATED PROTEINS (GIMAP) IN CNIDARIANS AND DINOFLAGELLATES, Jenny Christine Coelho* and Angela Zeccola Poole
- 4:00 THE ROLE OF SPHINGOSINE RHEOSTAT IN UPTAKE OF DINOFLAGELLATE SYMBIONTS BY THE SEA ANEMONE *EXAIPTASIA PALLIDA*, Mary B. Rowland*, Alexa M. Bilsky*, Sheila A. Kitchen, Aki Ohdera, and Angela Z. Poole

- 4:15 ALTERNATIVE GENES FOR EXPLORING RANAVIRUS PHYLOGENETICS: FOUR CORE GENES COMPARED TO THE MAJOR CAPSID PROTEIN.** , Abigale R. Garner* and Amanda L.J. Duffus
- 4:30 SELECT CORE GENES OF RANAVIRUS SUGGEST NEW MODELS FOR FUTURE PHYLOGENETIC STUDIES** , Amanda D. Mileham* and Amanda L.J. Duffus
- 4:45 INFLUENCE OF SEASON, INTERTIDAL ZONE, AND SEDIMENT DEPTH ON MEIOFAUNA OF NANNYGOAT BEACH, SAPELO ISLAND, GEORGIA, Kendall Maze* , Richard Settele* , Andrew Shirley* , David Turner* , Jill Schulze , and Nancy Eufemia Dalman

Posters (on display 4:00–6:00 pm, Student Center, Robinson Ballroom)

**Section IV: Physics, Mathematics, Computer Science and Technology
Room 4105, Nesbitt Building
L. Ajith DeSilva, Presiding**

- 2:00 A NUMERICAL APPROACH TO A HANGING SPRING-MASS-PENDULUM SYSTEM** , Zachary C. Patterson-Goss* and Javier E. Hasbun.
- 2:15 AN INVESTIGATION OF TRANSPARENT WIDE BAND GAP SEMICONDUCTORS** , Nicole Morris* , L. Ajith DeSilva, Dilip Chauhan and A. G. U. Perera.
- 2:30 ARTIFICIAL LOW PASS MATERIAL, Kayla Mack* and Arun Kumar Saha.
- 2:45 THE CONTINUED VARIABILITY OF ABSORPTION TROUGHS IN NGC 3783** Braven Lyall* , Astrid Dieguez* , and Jay Dunn.
- 3:00 **Break**
- 3:30 THE QUANTUM COMPUTATIONAL STUDY OF GEOMETRIC CONFIGURATIONS OF HCCCN CO₂ COMPLEX, Kyle Vuong* and Lu Kang.
- 3:45 UNDERSTANDING CLASSICAL MECHANICS THROUGH PEER LEADERSHIP** James C. Howard* and Javier Hasbun.
- 4:00 THE EFFECT OF TEMPERATURE AND HUMIDITY ON THE ELECTRICAL RESISTANCE OF BORON NITRIDE NANO-PARTICLES** Trevor Banks* and Ben DEMAYO.
- 4:15 EXACT AND NONSTANDARD FINITE DIFFERENCE SCHEMES FOR A MODIFIED LAW OF COOLING, William Dula* and Ronald E. Mickens.

Posters (on display 4:00–6:00 pm, Student Center, Robinson Ballroom)

FRIDAY POSTER PRESENTATIONS
Robinson Ballroom, Student Center
4:00–6:00 pm

Section I Posters: Biological Sciences

A BLIND STUDY ON THE PREVALENCE OF ANABOLIC STEROID CLENBUTEROL AMONG COLLEGIATE ATHLETES AND THE EFFECTIVENESS OF GOLD NANOPARTICLE LATERAL FLOW IMMUNOASSAY TEST-KITS., Joshua Queen* and Helene Peters

A COMPARATIVE PHENOTYPIC ANALYSIS OF BACTERIA COLLECTED FROM ELASTIC HAIR BANDS, Taylor M. Bennett*, Savannah H. Blalock*, and Jessi Barker Shrout

ANALYSIS OF HOXB₃A-SPECIFIC GENOMIC DNA AMONG EVOLUTIONARILY DIVERGENT TELEOST FISHES HAS REVEALED HIGH SEQUENCE DIVERGENCE IN PUTATIVELY FUNCTIONAL REGIONS, Abigail L. English* and Adam Davis

ANALYSIS OF WATER QUALITY WITH COMMUNITY RICHNESS, Michael J. Wiley*

ANALYZING PHYLOGENETIC RELATIONSHIPS AMONG RANAVIRUSES: MYRISTILATED MEMBRANE PROTEIN AND OTHER POTENTIAL ALTERNATIVES TO MAJOR CAPSID PROTEIN**, Riley B. Fuller* and Amanda L. J. Duffus

ANALYZING RANAVIRUS CORE GENES FOR PHYLOGENETIC RECONSTRUCTION**, Leigha M. Henson* and Amanda L. J. Duffus

BEE-CLIPSE 2017: DID THE SOLAR ECLIPSE AFFECT HONEY BEE (APIS MELLIFERA) BEHAVIOR, Caitlin Forkin*, Powell Bob, and Greg Payne

CAN ANCIENT FELIDS AND CANIDS BE DISTINGUISHED BASED UPON THEIR TOOTH MARKS? A CASE STUDY ON MODERN BONES, Nicole M. Crain*, Madison E. Ussery*, Todd B. Bennett*, Elizabeth J. Noble*, Cory E. Duckworth*, Jessica R. Patterson, and David B. Patterson

CAN YOU TRUST THE RESULTS OF YOUR AUTOMATED BAT CALL CLASSIFIER?, Sara Alisha Robertson* and Michael Bender

CRYPTIC SPECIATION IN A BIODIVERSITY HOTSPOT: AN INTEGRATED APPROACH TO SPECIES DELIMITATION IN THE RINGNECK SNAKE DIADOOPHIS PUNCTATUS, Emily E. Miles*, Polly J. Strott*, and Dr. Frank M. Fontanella

DO CAROLINA CHICKADEES BEHAVE ADAPTIVELY AGAINST THE NEWLY ESTABLISHED HOUSE WRENS?**, Kaveh Eden*, J. Lindley McKay, Aubrey P. Crowell*, and Olga Milenkaya

IN VITRO PROPAGATION OF STEVIA REBAUDIANA, Andrew P. Bryan*, Hung X. Ho*, and Pushpa Yadav

INVESTIGATING BYSSAL THREAD PRODUCTION IN NATIVE AND NON-NATIVE MUSSELS IN JACKSONVILLE, FLORIDA**, Ellery R. Harding* and Yvette L. Garner

INVESTIGATING THE INFLUENCE OF SMALL-SCALE LIGHT POLLUTION ON BAT ACTIVITY**, Anton L. Mejias*, Mason C. Calrisle*, and Michael J. Bender

INVESTIGATION OF CRYPTIC DIVERSITY IN THE CRAYFISH OF COASTAL GEORGIA, Caroline Fowler*, Jordan Yacoub*, and David Weese

INVESTIGATION OF TEMPORAL AND SPATIAL DIFFERENCES IN FISH COMMUNITIES OF THE HIWASSEE RIVER WATERSHED, Hannah Walker* and Aubrey Crowell*

LABORATORY EVALUATION OF SELECTED INSECTICIDES ON FIELD-COLLECTED POPULATIONS OF BOLLWORM AND TOBACCO BUDWORM LARVAE-2018-UPDATE, Bridget Piatt* and Greg Payne

NATIVE POPULATION IS MALADAPTED IN COMPETING WITH INVASIVE SPECIES, BUT INTRASPECIFIC VARIATION SUGGESTS CHANGING BEHAVIOR, Aubrey P. Crowell*, J. Lindley McKay, Kaveh Eden*, and Olga Milenkaya

PHYLOGEOGRAPHY AND POPULATION DEMOGRAPHY OF THE EASTERN WORM SNAKE CARPHOPHIS AMOENUS**, Brianna A. Baggett* and Frank Fontanella

SCENT LURES: DO THEY WORK FOR SMALL MAMMAL SAMPLING? Maggie M. Woodall*, Jancy O. Burge*, and Michael J. Bender

SEASONAL CHANGES IN REPTILE DIVERSITY AND DISTRIBUTION ACROSS VARYING ENVIRONMENTS IN SMITHGALL WOODS STATE PARK, WHITE COUNTY, GEORGIA**, Cory E. Duckworth*, Peyton Heath*, Morgan Kepner*, Madison Ussery*, Andrew Malphurs*, Elizabeth Noble*, Vanessa Reale*, Jake Roberts, Logan Ruchti*, Jasmine M. Williamson, David B. Patterson, and Jessica R. Patterson

SURVEY OF MANGROVE ROOT EPIBIONT COMMUNITY STRUCTURE IN BOCAS DEL TORO, PANAMA**, John T. Sparks Jr.* and Yvette L. Garner

TESTING ISLAND BIOGEOGRAPHY THEORY USING SMALL MAMMALS ON ISLANDS IN LAKE LANIER, GEORGIA, Alex Ceren*, Mary Redmon*, M. J. Bender, Gherry Martin, and Kevin O'Donnell

THE EFFECT OF A DOG'S AGE ON THE AMOUNT OF ORAL PENICILLIN RESISTANT BACTERIA, Justina R. Conena* and Andrea L. Kwiatkowski

THE EFFECT OF MICROPLASTICS ON LYTECHINUS VARIEGATUS**, Victoria Archbold*, Taylor Asman*, Kayla Grimes*, Octavio Aguado*, Vincent D. Bartolomei*, and Margaret S. Smith

THE OCCURRENCE AND DISTRIBUTION OF MELISSOCOCCUS PLUTONIUS (WHITE, 1912 AND NOSEMA CERANEA (FRIES, ET AL. 1996) IN HONEY BEES APIS MELLIFERA (LINNAEUS, 1758) FROM APIARIES IN SOUTH EAST GEORGIA., Sarah Batchelor* and Helene Peters

THE OCCURRENCE OF METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (ROSENBAACH, 1884) IN COLLEGIATE CONTACT AND NON-CONTACT SPORTS., Autumn Lopez* and Helene Peters

TYROSINASE CHARACTERIZATION AND EXPRESSION IN EXAIPTASIA PALLIDA, Alexa M. Bilsky*, Grace F. Bailey*, Mary Beth Rowland*, and Angela Z. Poole

UNIVERSITY OF NORTH GEORGIA HERBARIUM PROJECT**, Samantha Shea*, Hannah Umstead*, and Amber Rittgers*

DIVERGENT GENE EXPRESSION OF HOXB₃B IN TELEOST FISHES IS DUE TO DIVERGENCE OF UPSTREAM CIS-REGULATORY ELEMENTS, Erin Polvony* and Adam Davis

INVESTIGATION OF TEMPORAL AND SPATIAL DIFFERENCES IN FISH COMMUNITIES OF THE HIWASSEE RIVER WATERSHED, Hannah Walker* and Aubrey Crowell*

Section II Posters: Chemistry

PHOSPHORYLATING PROTEINS TO REPLACE CASEIN IN CHEESE ANALOGS**, Jessica Haskett and Jim Konzelman

SYNTHESIS AND ANTI-PROLIFERATIVE ACTIVITY OF N,N'-BIS-SUBSTITUTED-2,4-TRIAZOLIUM SALTS WITH LIPOPHILIC AND HYDROPHILIC SUBSTITUENTS, Thong Ta, ZiJie Lin, Shanina S. Johnson, John E. Gordon, Monica Frazier, Jonathan Meyers, and Kerri L. Shelton

THE ISOLATION OF CALCIUM OXALATE FROM FRESH SPINACH**, Shannon A. Falk* and Jeremy T. Cooper Ph. D

Section III Posters: Earth and Atmospheric Sciences

SOIL SEEDBANK ANALYSIS OF VARIOUS WETLAND TYPES ON SAPELO ISLAND**, Emily J. Glasco*, Marina Williams*, Idah Ngoma*, Samuel Mutiti, and Christine Mutiti

INVESTIGATING THE ABILITY OF WATER TREATMENT RESIDUALS TO FILTER CONTAMINANTS**, Lauren A. Barber*, Taylor Upole, and Mutiti Samuel

MICROPLASTICS IN COASTAL GEORGIA'S AQUATIC ENVIRONMENTS**, Amelia Gardner*, Stefan Becker*, Nadia Schenck*, and Samuel Mutiti

SELECTIVITY OF LYSIS BY OCTANOL-WATER; APPLICATION TO HARMFUL ALGAE, Cameron Chalker*, Esmeralda Hernandez*, and J.E. Schneider Jr.

STABILITY OF CHLOROPHYLL AND PHYCOCYANINE EXTRACTED FROM CYANOBACTERIA WITH OCTANOL: WATER, Esmeralda Hernandez*, Cameron Chalker*, and J.E. Schneider Jr.

EFFECTS OF PLANT SENESCENCE ON WATER QUALITY IN A SMALL, SEMI-ISOLATED FRESHWATER WETLAND, Summer G. Wright* and James B. Deemy Ph.D

EVALUATION OF THE MICROBIAL GROWTH, AS AN INDICATION OF WATER QUALITY, AT VARIOUS FOOD CONCENTRATION, Erin Kim*

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

A NOVEL GLASS FOR BIOLOGICAL APPLICATIONS**, Diane Patterson*, Peyton Butler*, Mohamed Odeh*, Andrew Duenas*, Ki Dae Kim*, Kisa S. Ranasinghe, and Rajnish Singh.

A SURVEY OF ULTRAVIOLET SPECTRA FOR UFO SIGNATURES**, Annie Truong* and Jay Dunn.

UP-CONVERSION BOOSTED ALL-INORGANIC CSPBBR₃ PEROVSKITE SOLAR CELL**, Christine C Nnyamah*, Tyler Hurst*, and Liqiu Zheng.

Section V Posters: Biomedical Sciences

ABLATING LEPTIN-MEDIATED CELL SURVIVAL WITH SMALL LEPTIN ANTAGONIST IN VARIOUS CANCERS, Crystal C. Lipsey*, Lyn Huff, Rob Robey, Michael M. Gottesman, and Ruben R. Gonzalez-Perez

DETERMINING THE ABILITY OF QUERCETIN AND RESVERATROL TO INHIBIT BAP-MEDIATED CYTOTOXICITY IN HEPG2 CELLS**, Kristen O. Scoggins and Jennifer C. Schroeder

DETERMINING WHETHER TURF BEAD EXTRACT IS MUTAGENIC IN THE PRESENCE OF CYP1A1**, Coleen C. Johnson and Jennifer C. Schroeder

DOES METHYLPHENIDATE DECREASE MUTATION RATES OF CIGARETTE SMOKE IN A MODIFIED AMES ASSAY?**, John J. Chisholm and Jennifer C. Schroeder

SELECT AGONISTS OF THE ARYL HYDROCARBON RECEPTOR AND THEIR EFFECTS ON LACTIC ACID LEVELS IN HUMAN HEPATOCYTES**, Haley E. Garrett and Jennifer C. Schroeder

Section VII Posters: Science Education

STEM IDENTITIES OF YOUNG BLACK MEN: RESILIENCE, PARTICIPATION & PERSISTENCE Kenton McNeal*, Adam Woods*, Amy Salter**

Section VIII Posters: Anthropology

COMPARISON OF MOLAR MORPHOLOGY FROM EXTANT CERCOPITHECID MONKEYS AND PLIOCENE PARAPAPIO FROM MAKAPANGSANG, SOUTH AFRICA USING ELLIPTICAL FOURIER ANALYSIS **, Alexander Chil Kim* and Frank L. Williams

DIETARY RECONSTRUCTION OF LATE NEOLITHIC FARMERS FROM THE MEUSE RIVER BASIN OF BELGIUM USING DENTAL MICROWEAR, Kate Sherrill and Frank L. Williams

EVALUATION OF MISSISSIPPIAN PERIOD HUNTING PRACTICES IN GEORGIA**, Bryant C. Long*

PATTERNS OF SWIFT CREEK INTERACTION IN THE CHATTAHOOCHEE RIVER VALLEY, Gary Owenby*

THE BIOARCHAEOLOGY OF THE TUGALO SITE (9ST1): DIET, DISEASE AND HEALTH OF THE PAST**, Nompumelelo B. Hlophe*

SCORING PREMOLAR AND MOLAR DENTAL MORPHOLOGY USING THE ARIZONA STATE UNIVERSITY DENTAL ANTHROPOLOGY SYSTEM, Chelsea D. Morgan* and Frank L. Williams

SATURDAY PAPER PRESENTATIONS

***Denotes student presenter**

**** Denotes student research in progress**

Section I: Biological Sciences Room 3101, Nesbitt Building Margaret Smith, Presiding

- 7:45 DETERMINING ANTLION SPECIES DIVERSITY IN GWINNETT COUNTY USING GENETIC ANALYSIS OF THE CO1 GENE **, Kassiel N. Serrano Rocha*, Madelyn D. Yaceczko*, Mark A. Schlueter, and Patrick W. Cain
- 8:00 DETERMINING ANTLION SPECIES DIVERSITY IN GWINNETT COUNTY USING MORPHOLOGICAL FEATURES AND PRINCIPAL COORDINATE ANALYSIS**, Madelyn D. Yaceczko*, Kassiel N. Serrano Rocha*, Mark A. Schlueter, and Patrick W. Cain
- 8:15 FACTORS IMPACTING PREDATOR TRAP DESIGN IN THE ANTLION**, Ashley K. Forrester*, Brianna M. Jimenez*, Mark A. Schlueter, and Patrick W. Cain
- 8:30 HABITAT PREFERENCES OF THE ANTLION (FAMILY MYRMELEONTIDAE) AND ITS IMPACT ON PIT CONSTRUCTION**, Rebeca Estefania Aceves Mundo*, Ceraya Carmel Nichols*, Mark A. Schlueter, and Patrick W. Cain
- 8:45 PREY PREFERENCES OF THE PREDATORY LARVA OF THE ANTLION (FAMILY MYRMELEONTIDAE) **, Tooba Anwar*, Alexis Adeojo*, Mark A. Schlueter, and Patrick W. Cain
- 9:00 THE RELATIONSHIP BETWEEN PREDATOR AND PREY BODY SIZE IN DETERMINING PREDATION SUCCESS IN THE ANTLION **, Dylan Philips*, Kaylee Phillips*, Gwyneth Rivera*, Mark A. Schlueter, and Patrick W. Cain
- 9:15 VARIABILITY IN PREDATION SUCCESS IN ANTLIONS (FAMILY MYRMELEONTIDAE) IN DIFFERENT HABITAT TYPE**, Amer Dzebo, Camille N. Beach*, Mark A. Schlueter, and Patrick W. Cain
- 9:30 BIOTIC AND ABIOTIC FACTORS INFLUENCING ANTLION PIT PLACEMENT**, Taylor G. Bowen*, Giovana A. Cabello*, Tyquan N. Gidden*, Mark A. Schlueter, and Patrick W. Cain
- 9:45 INVESTIGATING THE DEEP CHLOROPHYLL MAXIMUM IN LAKE LOUISE, GEORGIA**, Danielle M. Ward* and James A. Nienow
- 10:00 **Break and Section Business Meeting**

Section II: Chemistry
Room 3108, Nesbitt Building
Samuel Abegaz, Presiding

- 8:30 CONVERSION OF BIOMASS TO FORMIC ACID AT MODEST TEMPERATURES AND PRESSURES**, Savannah L. Hardin*, Lena M. Powell*, and Charles D. Swor
- 8:45 DIGITAL TEXTBOOK FOR SURVEY OF CHEMISTRY I COURSE**, Antara Dutta, Maher Atteya, and Jerry Poteat
- 9:00 PREPARATION, THERMAL PROPERTIES, SELF-ASSEMBLY AND GELATION STUDIES OF ACRIDINE LINKED CHOLESTERYL CARBAMATE, Tyler Sawyer and Ajay Mallia
- 9:15 SELF-ASSEMBLY AND GELATION STUDIES OF N-(HYDROXYALKYL) OCTADECANAMIDES BASED SIMPLY STRUCTURED LOW MOLECULAR MASS GELATORS, Janaki Patel and Ajay Mallia
- 9:30 SYNTHESIS AND APPLICATION OF HYDROGELS FOR NUTRIENT RECYCLING, Victor Sincevich, Madison Preston, Hannah Conner, and Seungjin Lee Ph.D.
- 10:00 **Break and Section Business Meeting**
- 10:30 THE FOLATE PATHWAY AS TARGET FOR ANTIMALARIAL ACTIVITY: MOLECULAR DOCKING OF SULFONAMIDES WITH PLASMODIUM AND BACTERIAL DIHYDROPTEROATE SYNTHASE, Emile W. Bongkiyung
- 10:45 ULTRAFILTRATION FOR SEPARATION AND PURIFICATION OF TRIGLYCERIDE TO BE USED IN THE PRODUCTION OF FATTY ACID METHYL/ETHYL ESTERS, Jason Mills and Seungjin Lee Ph.D.

Section III: Earth and Atmospheric Sciences
Room 3103, Nesbitt Building
Samuel Mutiti, Presiding

- 7:30 SELECTIVITY OF LYSIS BY OCTANOL-WATER; APPLICATION TO HARMFUL ALGAE, Cameron Chalker, Esmeralda Hernandez, and J.E. Schneider Jr.
- 7:45 STABILITY OF CHLOROPHYLL AND PHYCOCYANINE EXTRACTED FROM CYANOBACTERIA WITH OCTANOL: WATER, Esmeralda Hernandez*, Cameron Chalker*, and J.E. Schneider Jr.
- 8:00 RELATIONSHIP BETWEEN SALINITY AND ALGAL BIOMASS IN COASTAL WATERS OF GEORGIA**, Morgan Rasmussen*, Julia Steele*, Samuel Mutiti, Kalina Manoylov, and Christine Mutiti

- 8:15 SOIL SEEDBANK ANALYSIS OF VARIOUS WETLAND TYPES ON SAPELO ISLAND**, Emily J. Glasco*, Marina Williams*, Idah Ngomo*, Samuel Mutiti, and Christine Mutiti
- 8:30 THE DISTRIBUTION OF MACROINVERTEBRATES ON SAPELO ISLAND, GA, Marissa Louise Mayfield*, Julia Steele*, Samuel Mutiti, and Christine Mutiti
- 8:45 ASSESSING SOIL REDOX CONDITIONS USING IRIS TUBES IN A CENTRAL GEORGIA WETLAND, Cameron S. Skinner*, Allison Rick VandeVoort, Christine Mutiti, and Samuel Mutiti
- 9:00 MICROPLASTICS IN COASTAL GEORGIA'S AQUATIC ENVIRONMENTS**, Amelia Gardner*, Stefan Becker*, Nadia Schenck*, and Samuel Mutiti
- 9:15 DESCRIPTION OF EOCENE-AGED MAMMAL FOSSILS FROM WILKINSON COUNTY, GEORGIA, Parker D. Rhinehart* and Alfred J. Mead
- 9:30 PETROLOGIC AND PETROGRAPHIC ANALYSIS OF THE ALTAMAHA FORMATION IN THE SOPERTON AREA, TREUTLEN COUNTY, GEORGIA **, Wiley M. Griffin IV*
- 9:45: QUANTIFYING LEAD EXPOSURE THROUGH DUST, VEGETABLES AND FRUITS IN KABWE, ZAMBIA, Idah Ngoma* and Samuel Mutiti
- 10:00 **Break and Section Business Meeting**
- 11:00 PILOTING REMEDIATION STRATEGIES FOR LEAD POLLUTION IN KABWE ZAMBIA**, Samuel Mutiti, Idah Ngoma*, Victor Shitumbanuma Dr, and Rachel Serafin
- 11:15 SUMMARY OF UNDERGRADUATE RESEARCH ACTIVITIES ON PEGMATITES IN THE NORTHCENTRAL GEORGIA BLUE RIDGE**, Mark S. Groszos, Richard R. Arnett, Kristen L. Gholson, Hunter T. McDermitt, Danial W. Ragan, Richard W. Thomas, and Kavin Towne
- 11:30 THE LATE PLEISTOCENE ENVIRONMENT OF COASTAL GA AS INDICATED BY THE FAUNA OF CLARK QUARRY, GLYNN COUNTY, GA, Alfred J. Mead
- 11:45 DIATOM VOUCHER FLORA AND COMPARISON OF COLLECTION METHODS FOR SOUTHEASTERN TRIBUTARY UPPER THREE RUNS CREEK**, Katie M. Johnson* and Dr. Kalina M. Manoylov

Section IV: Physics, Mathematics, Computer Science and Technology
Room 4105, Nesbitt Building
L. Ajith DeSilva, Presiding

- 9:00 STRUCTURAL ANALYSIS OF A BIOACTIVE GLASS CONTAINING NANOCERIA**, Kisa S. Ranasinghe and Rajnish Singh.
- 9:15 MODEL OF PIEZOELECTRIC COEFFICIENT OF HEXAGONAL TWO-DIMENSIONAL MATERIALS, Lok C. Lew Yan Voon, Morten Willatzen, and Zhong Lin Wang.
- 9:30 MARS SOUTH POLAR CAP SIZE AND POSITION IN 2018, Richard W. Schmude Jr.
- 9:45 ULTRAVIOLET BRIGHTNESS OF URANUS AND NEPTUNE, Richard W. Schmude Jr. and Brian Harden*.
- 10:00 **Break and Section Business Meeting**
- 10:30 A THREE BLADE WIND TURBINE WITH OPTIMIZED PERFORMANCE, R. Luminda Kulasiri.
- 10:45 OPTICAL TRAPPING AND ITS MODELING**, Javier E. Hasbun Dr. and Suvranta K. Tripathy.
- 11:00 ELEMENTARY DERIVATION OF THE NUCLEAR FORCE RANGE-POTENTIAL DEPTH RELATIONSHIP, 'Kale Oyedeji and Ronald E. Mickens.
- 11:15 DEVELOPMENT OF ENERGY CONCEPTS AND WORK-KINETIC ENERGY THEOREM, D.G. Sumith P. Doluweera.
- 11:30 PARTICULATE DAMPERS FOR ABSORPTION OF STRUCTURAL VIBRATIONS AT AUDIBLE FREQUENCIES, Hasson M. Tavossi.

Section V: Biomedical Sciences
Room 3104, Nesbitt Building
Mark Hollier, Presiding

- 8:15 Establishment of CRISPR/Cas9-Aided Knockout of the ZIC2 gene in the African American Prostate Cancer Cell Line E006AA-Pr, Janelle C. Moore
- 8:30 ALTERATIONS IN MELANIN CONTENT IN RESPONSE TO OXIDATIVE STRESS IN EMBRYONIC ZEBRAFISH**, J. Blake Metivier* and Linda G. Jones
- 8:45 ANALYSIS OF BIOLOGICAL ACTIVITY OF A NOVEL BIOACTIVE GLASS**, Rajnish Singh and Kisa Ranasinghe

- 9:00 BRACES/SPLINT DESIGN FOR A RADIAL NERVE INJURY, Patrick R. Hodgins* and Abiye Seifu
- 9:15 Investigating the Interaction between Adenoviral Protein E4 11k and Cellular Processing Body Protein Ddx6**, Courtney Faith Moon and Kasey A. Karen
- 9:30 INVESTIGATION OF THE ANTIMICROBIAL PROPERTIES OF SANGUINARIA CANADENSIS EXTRACT **, Bailey Strickland, Andrea L. Kwiatkowski, and Paul T. Arnold
- 9:45 Localization of Pat1b Proteins During Adenovirus Infection**, Kaylyn ReNae Scanlon and Kasey A. Karen
- 10:00 **Break and Section Business Meeting**

Section VI: Philosophy and History of Science
Room 3105, Nesbitt Building
Charmayne E. Patterson, Presiding

- 9:00 ORMSBY MITCHELL AND THE CINCINNATI OBSERVATORY, Bob Powell and David Powell
- 9:30 THE LEVEL STRUCTURE OF MATHEMATICS: SOME IMPLICATIONS, Imani Beverly and Ronald E. Mickens
- 10:00 **Break and Section Business Meeting**
- 10:30 THE ROLES OF ACADEMIC GENEALOGIES, Ronald E. Mickens and Charmayne Patterson
- 11:00 UNAVAILABLE: THE SCHOLARLY WORK SEARCH AND RETRIEVAL IMPASSE, Bryan A. Briones

Section VII: Science Education
Room 3106, Nesbitt Building
Peter A. Roessle, Presiding

- 10:00 INCREASING STUDENTS' SUCCESS IN SURVEY OF CHEMISTRY II COURSE, Pavielle M. Johnson
- 10:30 INCREASING THE CONFIDENCE OF STUDENT SCIENTISTS THROUGH ACADEMIC INTERVENTIONS AT MINORITY-SERVING INSTITUTIONS Brittany O. Chambers**
- 11:00 **Break and Section Business Meeting**

**Section VIII: Anthropology
Room 3107, Nesbitt Building
Alice Gooding, Presiding**

- 8:45 CONTEXTUALIZING PREHISTORIC OCCUPATION AT 9DW276 (RICE FARM), DAWSON COUNTY, GEORGIA**, William M. Balco and Cole Ashby
- 9:00 INTERPRETING PREHISTORIC POTTERY FROM 9DW276 (RICE FARM), DAWSON COUNTY, GEORGIA**, Rebekah Jackson* and William M. Balco
- 9:15 THAT DAM OVERLOOK: SUSSING OUT SETTLEMENT IN SCRIVEN**, M. Jared Wood, Joshua A. Herrin, and J. Valentino Sheridan IV
- 9:30 PRESERVING THE MEMORY OF THOSE PERILOUS TIMES: ARCHAEOLOGY OF A CIVIL WAR PRISON IN BLACKSHEAR, GEORGIA**, Colin H. Partridge*
- 9:45 ENERGY EXPENDITURE ACROSS THE ETOWAH CHEIFDOM: TESTING A HUMAN MODEL AGAINST ESTABLISHED ALGORITHMS**, Alice F. Gooding, Joseph Eleam*, and Patrick Wilborn*
- 10:00 **Break and Section Business Meeting**
- 10:30 TESTING ANCESTRAL HOMOGENEITY OF ANATOMICAL TEACHING CRANIA**, Christopher M. Goden, Alice F. Gooding
- 10:45 ENGAGING WITH THE PUBLIC: AN EXAMINATION OF AN ANTHROPOLOGY OUTREACH PROGRAM, Hannah D. Bauguess*

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>