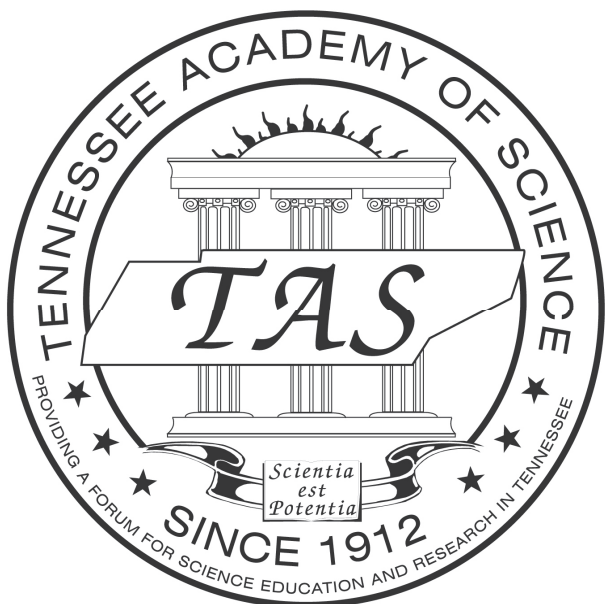


**126th Meeting
Tennessee
Academy of
Science**



**November 19, 2016
Austin Peay
State University,
Clarksville, Tennessee**

Celebrating 104 Years

Tennessee Academy of Science Institutional Sustaining Members

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2017 - The University of Tennessee at Martin

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Welcome . . .

... to the 2016 Annual Meeting of the Tennessee Academy of Science! We hope you enjoy and benefit from this opportunity to present your research, to learn of other research going on in Tennessee, to interact in a relaxed atmosphere with other science professionals and to participate in the business of the Academy.

Please let members of the Executive Committee know if you have any needs or questions and if the meeting in any way does not meet (or if it exceeds) your expectations (e.g., the Saturday “experiment” for our Annual Meeting). We are always striving to improve our Academy and its impact upon sci-entists in Tennessee and beyond.

Announcements

If they are not already TAS members, presenters and attendees may register/become members by mail or at the Annual Meeting.

Registration/Membership forms will be available on-site, and they are available for download from the TAS website:

www.tennacadofsci.org

Dues can be paid in advance of the Annual Meeting or at on-site registration.

Student	\$ 10 annually
Emeritus	\$ 10 annually
Member	\$ 40 annually
Sustaining	\$ 50 annually
Supporting	\$ 100 annually
Life	\$ 400 single payment

In advance of the Annual Meeting, registration/membership forms can be mailed to the TAS Treasurer (please postmark by November 9):

Dr. Steve Murphree,
Department of Biology, Belmont University,
1900 Belmont Boulevard, Nashville, TN 37212-3757

A limited number of **luncheon tickets** will be available for purchase at the registration tables.

Meeting Schedule

Friday, November 18, 2016

5:30 p.m. until 10:00 p.m.	Executive Committee Meeting and Dinner Iris Room, Morgan University Center
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Saturday, November 19, 2016

7:30 a.m. until 1:00 p.m.	Registration Sundquist Science Complex Atrium
7:30 a.m. until 8:30 a.m.	Poster Setup Sundquist Science Complex Atrium (Poster board and easel provided— look for the designated area to set up your poster)
7:30 a.m. until 8:00 p.m.	Meeting of Section Chairs TBD TAS Committee Meetings TBD
8:30 a.m. until 1:00 p.m. 8:30 a.m. until 9:45 a.m.	Poster Display Poster Presentation and Judging Sundquist Science Complex Atrium and Halls
10:00 a.m. until 10:30 a.m.	TAS Business Meeting Sundquist Science Complex E106
10:30 a.m. until 10:35 a.m.	Welcome Dr. Jaime R. Taylor, Dean, College of Science and Mathematics Sundquist Science Complex E106
10:35 a.m. until 11:30 a.m.	Plenary Session Presented by Dr. Carmelo J. Rizzo Sundquist Science Complex E106
11:30 a.m. until 1:00 p.m.	Luncheon Sundquist Science Complex Atrium
1:00 p.m. until finished	Afternoon Technical Sessions/ Section Business Meetings Sundquist Science Complex C120, C123, C220, C224, D210, D319, E203, E205, E206, E208, E303, E305, E306, E310

Meet our Keynote Speaker

10:30 -11:30 Sundquist Science Complex E106

Dr. Carmelo J. Rizzo,

Vanderbilt University

Carmelo Rizzo earned his Bachelor's degree from Temple University. After working a summer at McNeil Laboratories (now Johnson & Johnson Pharmaceutical Research and Development) he entered graduate school at the University of Pennsylvania. During this time, he was trained as a synthetic organic chemist under the direction of Professor Amos B. Smith, completing his Ph.D. in 1990. He then spent 2 years at Columbia University as an NIH Post-doctoral Research Associate in Professor Ronald Breslow's lab. He has been a faculty member at Vanderbilt University since 1992. His research interests are focused on the chemistry and biology of DNA damage. He has co-authored 125 peer-reviewed publications over his career. While at Vanderbilt, Professor Rizzo has served a Deputy Director of the Center in Molecular Toxicology and is currently the Director of Graduate Studies for the Department of Chemistry.

Presentation Title:

DNA Damage: A Key Event in Carcinogenesis and Cancer Chemotherapy

Abstract

DNA damage is widely considered an initiating event in carcinogenesis. DNA is also the cellular target for a number of clinically used cancer chemotherapeutic agents. Two commonly used classes of chemotherapeutic agents that target DNA are alkylating agents and intercalators, which are often administer in combination. Although these agents both target DNA, they are believed to work by different mechanisms. We are exploring a new mechanism of action of a common DNA intercalating agent based on newly discovered reactivity, which is predicted to show synergy with a DNA alkylating agents. The overall goal of these studies is to provide new strategies that improve the efficacy of combination therapies.

Oral Presentations (Student Awards will be given at the end of each Section)

Agriculture

Chair: Tony Johnston
SSC D210
1:00 p.m.– 3:20 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Career readiness skills for veterinary science students. **Clint Ary, Jason Roberts, Renee Stubblefield and J.E. Mehlhorn**, *University of Tennessee – Martin, Martin, Tennessee.*

1:20-1:35 Determination of the best winter canola variety for Tennessee. **Edmund Tetteh* and Jason P. de Koff**, *Tennessee State University, Nashville, Tennessee.*

1:35-1:50 Raccoons (*Procyon lotor*) as potential vectors for zoonotic disease in Martin, Tennessee. **C. Cain*, C. Ary and J. Roberts**, *University of Tennessee at Martin, Martin, Tennessee.*

1:50-2:05 Effect of low-level laser therapy on canine lick granuloma. **Sarah Anderson*, Clint Ary, Amanda Waldon and Erica Carroll**, *University of Tennessee at Martin, Martin, Tennessee.*

2:05-2:20 Unmanned aerial vehicle research at UT Martin. **Patton Webb*, Philip Smartt and Sandy Mehlhorn**, *The University of Tennessee at Martin, Martin, Tennessee.*

2:20-2:35 Controlling powdery mildew on flowering dogwood with different fungicides and biorational products. **Md Niamul Kabir*, Prabha Liyanapathirana, Terri Simmons and Fulya Baysal-Gurel**, *Tennessee State University, Nashville, Tennessee.*

2:35-2:50 Detection of pharmaceuticals in East Fork Stones River in Rutherford County, Tennessee. **Ravneet Kaur*, Anonya Akuley-Amenyenu and Sam Dennis**, *Tennessee State University, Nashville, Tennessee.*

* student author

presenting author, if not first author

2:50-3:05 Zoonotic risk: a study of crypto infection rates of cattle in Lincoln County Tennessee. **Aaron Helms* and Christina Galben**, *Austin Peay State University, Clarksville, Tennessee.*

3:05-3:20 Single-cell type proteomics for studying stress-induced pollen infertility. **Yingde Zhu*, Suping Zhou, Hui Li, Sarabjit Bhatti and Ted Thannhauser**, *Tennessee State University, Nashville, Tennessee and Agricultural Research Service, United States Department of Agriculture, Ithaca, New York.*

Botany

Chair: Sunny Fleming
SSC E205
1:00 p.m. – 2:20 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Evaluation of the composition and structure of algae assemblages in response to eutrophication in Tennessee streams. **Molly R. Grimmer* and Jefferson G. Lebkuecher**, *Austin Peay State University, Clarksville, Tennessee.*

1:20-1:35 Pollination and phenology analysis of the endangered endemic, *Physaria globosa* (Brassicaceae). **Heath Thacker* and Shawn Krosnick**, *Tennessee Technological University, Cookeville, Tennessee.*

1:35-1:50 New insights into the reproductive biology of *Passiflora incarnata* L. (Passifloraceae) in Middle Tennessee. **Shawn E. Krosnick**, *Tennessee Technological University, Cookeville, Tennessee.*

1:50-2:05 Germination of exotic versus native winter annuals in response to changes in moisture and temperature. **Rachael N. Hicks*, Fenglan Wang, Siti N. Hidayati and Jeffrey L. Walck**, *Middle Tennessee State University, Murfreesboro, Tennessee.*

2:05-2:20 A survey of the vascular flora of Cedar Hill Wildlife Management Area, Robertson County, Tennessee. **John Shelton* and Dwayne Estes**, *Austin Peay State University, Clarksville, Tennessee.*

* student author

presenting author, if not first author

Cell and Molecular Biology

Chair: **Bonny B. Millimaki**

SCC D319

1:00 p.m. – 2:05 p.m.

1:00-1:05 Business Meeting

1:05-1:20 A genetic model system to reveal processes underlying human polyglutamine diseases. **Elise A. Kikis, Amy Lee*, Fridien Tchoukous* and Hailey Ung***, *The University of the South, Sewanee, Tennessee.*

1:20-1:35 Expression and characterization of immune function genes and toll-like receptors (TLR) in the adult Guinea fowl using transcriptome analysis. **Gabriel Akerele*, Samuel Nahashon and Thyneice Taylor**, *Tennessee State University, Nashville, Tennessee.*

1:35-1:50 Growth and metabolic indices of furazolidone-induced cardiomyopathy in the pearl grey Guinea fowl. **Collins Khwatenge*, Samuel Nahashon and Thyneice Taylor**, *Tennessee State University, Nashville, Tennessee.*

1:50-2:05 Investigating olfactory hyper-sensitivity in fragile X syndrome mice. **Priscilla O. Ajilore***, *Drexel College of Medicine, Philadelphia, Pennsylvania, and Lee University, Cleveland, Tennessee.*

Chemistry

Chair: **Sarah Pierce**

SSC C220

1:00 p.m. – 2:20 p.m.

1:00-1:05 Business Meeting

1:05-1:20 The preparation and reactivity of novel ferrocene complexes via several common organic condensation reactions. **Makayla Brashears*, Stephen Everly, Cassandra Jones*, Hannah Oakes*, and Emily Thompson***, *Lincoln Memorial University, Harrogate, Tennessee.*

1:20-1:35 The quantification of formaldehyde produced from E-cigarettes by different E-juices. **Krista Gardner* and Sarah S. Pierce**, *Cumberland University, Lebanon, Tennessee.*

1:35-1:50 The synthesis and antimicrobial activity of potential beta-lactamase inhibitors in combination with antibiotics. **Joshua A. Herring*, Ashleigh L. Prince, Alexandra D. Slagle*, Kadie R. Soall* and Tiffany N. Thoms***, *Lincoln Memorial University, Harrogate, Tennessee.*

1:50-2:05 Atmospheric spectroscopy: comparison of FTIR and cavity-ring down spectroscopic techniques in trace-greenhouse gas monitoring. **Samuel Hines*, Lahiru Gamage* and Wilson Gichuhi**, *Tennessee Technological University, Cookeville, Tennessee.*

2:05-2:20 Green synthesis of Dilantin. **Veronica C. Sublett* and Daniel J. Swartling**, *Tennessee Technological University, Cookeville, Tennessee.*

Ecology and Environmental Science

Chair: **Jeronimo Gomes Da Silva Neto**

SSC E306

1:00 p.m. - 3:20 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Contributions to ecology of the globally- rare Hall's Bulrush [*Schoenoplectiella hallii* (A.Gray) Lye, Cyperaceae]. **Edward W. Chester**, *Austin Peay State University, Clarksville, Tennessee.*

1:20-1:35 Effects of mining on aquatic macroinvertebrate communities in surface mined streams of the Cumberland Mountains in East Tennessee. **Gordon A. Counts* and Joseph R. Schiller**, *Austin Peay State University, Clarksville, Tennessee.*

* student author

presenting author, if not first author

* student author

presenting author, if not first author

1:35-1:50 Monitoring agriculturally impacted ponds using aquatic macroinvertebrates in West Tennessee: a ten-year study. **Lauren K. Schnorr* and Steven Hamilton**, *Austin Peay State University, Clarksville, Tennessee.*

1:50-2:05 Depressed, wet, and in the woods: macroinvertebrate community variation in temporary woodland pools. **Brandy N. Schnettler*, Steven W. Hamilton and Joseph R. Schiller**, *Austin Peay State University, Clarksville, Tennessee.*

2:05-2:20 Bioaccumulation of mercury in spotted bass from Norris Reservoir, Tennessee. **Aggy Vanderpool, Damon Johnson and Brian Evanshen**, *Lincoln Memorial University, Harrogate, Tennessee, and East Tennessee State University, Johnson City, Tennessee.*

2:20-2:35 Impacts of forest management on small mammal communities in pine-hardwood forests of Alabama. **Brent C. Newman* and William B. Sutton**, *Tennessee State University, Nashville, Tennessee.*

2:35-2:50 Assessment of grazing snail (*Tegula tridentata*) behavior on different qualities of kelp (*Lessonia trabeculata*). **Gabrielle L. Armour*, Dennis Mullen, and Evie Wieters**, *Middle Tennessee State University, Murfreesboro, Tennessee (GA, DM), and Estación Costera de Investigaciones Marinas de la Pontificia Universidad Católica de Chile (EW).*

2:50-3:05 Use of remote sensing data to model aboveground woody biomass in Tennessee. **Man K. Giri* and Bharat Pokharel**, *Tennessee State University, Nashville, Tennessee.*

3:05-3:20 Microhabitat selection by the Eastern Hellbender salamander (*Cryptobranchus alleganiensis alleganiensis*) in Tennessee. **Jeronimo Gomes Da Silva Neto* and William B. Sutton**, *Tennessee State University, Nashville, Tennessee.*

* student author

presenting author, if not first author

Engineering & Engineering Technology

Chair: John Byrd

SSC E203

1:00 p.m. - 2:05 p.m.

1:00-1:05 Business Meeting

1:05-1:20 DC motor speed control via a centralized control system over a ProfiBus network. **Parker Wyatt*, William Sunderland*, Blake Johnson*, Omar Tantawi, and Khalid H. Tantawi**, *Motlow State Community College, Smyrna, Tennessee.*

1:20-1:35 A low-cost metal detector with wireless transmission. **Yasmin Musa* and Khalid H. Tantawi**, *Motlow State Community College, Smyrna, Tennessee.*

1:35-1:50 Recent advances in friction stir welding for in-space manufacturing. **Russ Longhurst and Allyn Smith**, *Austin Peay State University, Clarksville, Tennessee.*

1:50-2:05 Additive manufacturing, innovation and techno-entrepreneurship ecosystem in the Upper Cumberland Region. **Ismail Fidan**, *Tennessee Technological University, Cookeville, Tennessee.*

Geology and Geography

Chair: Michael W. Bradley

SSC C120

1:00 p.m. - 2:05 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Water depth and distance from shoreline for the Coon Creek Formation (Western Tennessee) in the Late Cretaceous Eastern Mississippi Embayment portion of the Cretaceous Interior Seaway. **Michael A. Gibson**, *The University of Tennessee at Martin, Tennessee.*

1:20-1:35 Groundwater hydrology in a karst aquifer at Tennessee State University. **Renas Barzanji*, Lonnie Sharpe and Tom Byl**, *Tennessee State University, Nashville, Tennessee (RB, LS), U.S. Geological Survey, Nashville, Tennessee (TB).*

* student author

presenting author, if not first author

1:35-1:50 Attenuating acid-rock drainage by stimulating sulfur-reducing bacteria. **Tom Byl and Michael Bradley**, U.S. Geological Survey, Nashville, Tennessee.

1:50-2:05 A statistical interpretation of the pear- shape of the Earth. **A. Tan, A. Alomari* and M. Schamschula**, Alabama A & M University, Normal, Alabama.

Health and Medical Sciences

Chair: D. Nicholas Ragsdale
SSC E303

1:00 p.m. - 1:20 p.m.

1:00-1:05 Business Meeting

1:05-1:20 A veterinarian's perspective: experiential learning by undergraduate pre- veterinary students. **Christina W. Galben**, Austin Peay State University, Clarksville, Tennessee.

History of Science

Chair: Brother Kevin Ryan
Co-Chair: Martin V. Stewart
SSC C224

1:00 p.m. – 1:50 p.m.

1:00-1:05 Business Meeting

1:05-1:20 The making of the atomic bomb. **Brother Kevin Ryan**, Christian Brothers University, Memphis, Tennessee.

1:20-1:35 Proclus' commentary on the first book of Euclid's Elements. **John J. Schommer**, University of Tennessee at Martin, Martin, Tennessee.

1:35-1:50 Archibald Belcher's work experiences in Fort Worth, Texas (1906 – 1907). **Martin V. Stewart**, Middle Tennessee State University, Murfreesboro, Tennessee.

Mathematics and Computer Science

Chair: David R. Grimmatt

SSC E208

1:00 p.m. - 4:05 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Block Numerov-type numerical method for fractional variation of van der Pol equation. **Paul M. Watkins* and Samuel N. Jator**, Austin Peay State University, Clarksville, Tennessee

1:20-1:35 Conservation of African elephants. **Travis Collard*, Jessica Elliott* and Alison Flowers***, Austin Peay State University, Clarksville, Tennessee

1:35-1:50 Defining the cycle space associated to orbits of semi-simple lie groups, **Ben Ntatin**, Austin Peay State University, Clarksville, Tennessee.

1:50-2:05 Developing a new block method to solve Schrödinger's equation using mixed basis functions. **Kaitlyn J. McCollum* and Samuel N. Jator**, Austin Peay State University, Clarksville, Tennessee.

2:05-2:20 Fractional calculus and its applications. **Kindyl L. King*, Samuel N. Jator**, Austin Peay State University, Clarksville, Tennessee.

2:20-2:35 High plains aquifer model. **Ramanjit K. Sahi, Jonathan Collins*, Micah Folk*, Jesse Guy* and Patricia Iman-Hill***, Austin Peay State University, Clarksville Tennessee.

2:35-2:50 Linearization and solution approximations for nonlinear differential equations. **Allison B. Hardee* and Daniel Biles**, Belmont University, Nashville, Tennessee.

2:50-3:05 Mapping the unmapped of Nigeria **Oluwatito P. Ebiwonjumi* and William Hooper**, Belmont University, Nashville, Tennessee.

3:05-3:20 Problems in algebraic combinatorics. **Tucker L. Dowell* and Brad Schleben**, Belmont University, Nashville, Tennessee.

* student author

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3:20-3:35 Using topological invariants to prove selected calculus theorems. **Brent Champion***, **Paul M. Watkins*** and **Ben Ntatin**, *Austin Peay State University, Clarksville, Tennessee.*

3:35-3:50 Variations of network attitudinal models. **Emily Stark*** and **Mark Orr**, *Austin Peay State University, Clarksville, Tennessee and Virginia Polytechnic Institute and State University, Blacksburg, Virginia.*

3:50-4:05 Vector representations of musical harmonic structures. **Brandon Stephens and Peter Eigel**, *Belmont University, Nashville, Tennessee.*

Microbiology
Chair: **Chris Barton**
SSC C123
1:00 p.m. - 1:35 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Impact of coaggregation in biofilm formation of early dental plaque streptococci **Anika Ahmed***, **Ashley Frantellizzi***, **Steven P. Tammariello** and **Giancarlo A. Cuadra**, *Lincoln Memorial University, Harrogate, Tennessee (AA, GC) and Binghamton University, Binghamton, New York (AF, ST).*

1:20-1:35 Anti-microbial activities of endophytic fungal crude extracts isolated from flowering dogwoods (*Cornus florida* L.). **Asha Maheshwari***, **Margaret Mmbaga** and **Agnes K. Kilonzo-Nthenge**, *Tennessee State University, Nashville.*

Physics and Astronomy
Chair: **J. Allyn Smith**
SSC E206
1:00 p.m. – 3:05 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Modeling chalcogenide glasses and thin films using the cation-interlinking network cluster approach (CINCA) with post-Hartree-Fock Methods. **Justin Oelgoetz** and **Laura Judy***, *Austin Peay State University, Clarksville, Tennessee.*

* student author

presenting author, if not first author

1:20-1:35 Initial results of annealed carbon films from paste deposition. **Kevin W. Cooper and Alicia Jessie***, *Lincoln Memorial University, Harrogate, Tennessee.*

1:35-1:50 Zinc oxide nanowire scintillator for ultrafast gamma-ray detection. **Daniel C. Mayo**, **Claire E. Marvinney***, **Richard R. Mu** and **Richard F. Haglund Jr.**, *Austin Peay State University, Clarksville, Tennessee (DM), Fisk University, Nashville, Tennessee (RM), and Vanderbilt University, Nashville, Tennessee (CM, RH).*

1:50-2:05 Citizen science with NASA/MSFC, the U.S. Space and Rocket Center, and Austin Peay State University for the 2017 eclipse. **Mitzi Adams**, **Dennis Gallagher**, **Ghee Fry**, **J. Allyn Smith** and **Spencer Buckner**, *NASA-MSFC, Huntsville, AL (MA, DG, GF), and Austin Peay State University, Clarksville, Tennessee (JAS, SB).*

2:05-2:20 Repeat of the Eddington experiment for the 2017 total solar eclipse, **Spencer L. Buckner**, *Austin Peay State University, Clarksville Tennessee.*

2:20-2:35 Examination of variability in BD+17° 4708. **Jesse McGaha***, **J. Allyn Smith** and **Douglas Tucker**, *Austin Peay State University, Clarksville, Tennessee (JM, JAS), and Fermi National Accelerator Lab, Batavia, Illinois (DT).*

2:35-2:50 A new cataclysmic variable: WDC_0234-455 **Jamin E. Welch***, **Mees B. Fix**, **J. Allyn Smith**, **Douglas Tucker** and **William Wester**, *Austin Peay State University, Clarksville, Tennessee (JW, JAS), Space Telescope Science Institute (MBF), and Fermi National Accelerator Lab, Batavia, Illinois (DLT, WW).*

2:50-3:05 New insights on the open cluster Dolidze-35. **J. Allyn Smith**, **Jacob Robertson***, **Deborah Gullede*** and **Douglas Tucker**, *Austin Peay State University, Clarksville, Tennessee (JAS, JR, DG), and Fermi National Accelerator Lab, Batavia, Illinois (DT).*

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Science and Mathematics Teaching

Chair: Weston Dulaney SSC E305
1:00 p.m. – 3:20 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Implementing “interdisciplinary teaching about Earth for a sustainable future” (InTeGrate) undergraduate education modules at Middle Tennessee State University. **Mark J. Abolins, Judith Iriarte-Gross and Lisa Langenbach**, Middle Tennessee State University, Murfreesboro, Tennessee.

1:50-2:05 How studying globular clusters can bridge the divide between experts and novices in astronomy. **Christopher McDonald* and Jo Lynn Tyner***, Austin Peay State University, Clarksville, Tennessee.

2:05-2:20 Exploring the impact of an arboretum curriculum designed for undergraduate biology students. **Patrick E. Phoebus*, Michael Rutledge and Kim Cleary Sadler**, Middle Tennessee State University, Murfreesboro, Tennessee.

2:20-2:35 A novel method of commercial antacid tablet analysis for the introductory chemistry lab. **Stephen C. Everly and Ashleigh Prince**, Lincoln Memorial University, Harrogate, Tennessee.

2:35-2:50 Inquiry-based learning for math education majors in a number theory class. **Nick Kirby**, Austin Peay State University, Clarksville, Tennessee.

2:50-3:05 Connecting with our students: traditional approaches and radical ideas. **Jennifer T. Thomas**, Belmont University, Nashville, Tennessee.

3:05-3:20 DNA barcoding as a research and teaching tool in the undergraduate curriculum. **Darlene Panvini and Chris Barton**, Belmont University, Nashville, Tennessee.

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presenting author, if not first author

Zoology

Chair: Juliann Waits SSC E310
1:00 p.m. – 2:50 p.m.

1:00-1:05 Business Meeting

1:05-1:20 Differential utilization of arboreal and ground level habitat by the North American deer mouse (*Peromyscus maniculatus*). **Kelsi Palmer*, Nathanael Prather and Michael L. Kennedy**, The University of Memphis, Memphis, Tennessee.

1:20-1:35 A comparison of biodiversity measures of small mammals at arboreal and ground levels in edge habitat of eastern deciduous forest. **Sarah E. Swing* and Michael L. Kennedy**, The University of Memphis, Memphis, Tennessee.

1:35-1:50 I'm not your steppin' stone: recent winter finds and current distribution of the streamside salamander, *Ambystoma barbouri*, in Tennessee. **David I. Withers, Sunny A. Fleming and Stephanie A. Williams**, Division of Natural Areas and Tennessee State Parks, Tennessee Department of Environment and Conservation, Nashville, Tennessee.

1:50-2:05 Interspecific association of ticks on small mammals in Western Tennessee. **Rebecca A. Butler*, Rebecca Trout-Fryxell, Allan E. Houston and Michael L. Kennedy**, The University of Memphis, Memphis, Tennessee (RB, MLK), The University of Tennessee, Knoxville, Tennessee (RTF), The Ames Plantation, Grand Junction, Tennessee (AEH).

2:05-2:20 Sex ratio and fawn-doe ratio for white-tailed deer (*Odocoileus virginianus*) at the Milan Army Ammunition Plant. **Felice A. Murden*, Steve W. Stephenson and Michael L. Kennedy**, The University of Memphis, Memphis, Tennessee (FAM, MLK), Milan Army Ammunition Plant, Milan Tennessee (SWS).

* student author

presenting author, if not first author

2:20-2:35 Ruby-throated hummingbird (*Archilochus colubris*) population growth possibly facilitated by sucrose from feeders. **T. David Pitts**, Martin, Tennessee.

2:35-2:50 Color preferences in foraging *Manduca sexta*: background color, illumination, and the use of achromatic and chromatic signals. **William Kuenzinger***, **Jonathan Travis***, **Jordan Weesner*** and **Joaquin Goyret**, University of Tennessee at Martin, Martin, Tennessee.

Poster Presentations

Sundquist Science Complex Atrium

Set Up: 7:30-8:30 a.m.

(Poster board & easel are provided; posters are displayed by technical section name and number)

Display: 8:30 a.m. – 1:00 p.m.

Judging: 8:30 – 9:45 a.m.

(Presenters should be near their displays during the judging to answer questions.)

Agriculture Posters

1-01 Heirloom tomato germination in Tennessee. **Stacy Warwick***, **S.A. Mehlhorn**, **Phillip Smartt**, and **J.E. Mehlhorn**, University of Tennessee – Martin, Martin, Tennessee.

1-02 Diversification, capital structure, and gross sales among farm business households: how does Tennessee compare? **Aditya R. Khanal** and **Suraj Adhikari***, Tennessee State University, Nashville, Tennessee.

1-03 Honduran coffee trade: economic effects of fair trade certification on individual producers. **Kevin Herrell***, **Rachna Tewari** and **Joey Mehlhorn**, University of Tennessee at Martin, Martin, Tennessee.

1-04 Evolution of online agriculture education: The MSANR case. **Jessica Crews-Garcia** and **J.E. Mehlhorn**, University of Tennessee – Martin, Martin, Tennessee.

1-05 Development of a low-cost protoplast isolation for soybean and canola transformation. **Mary Jane Espina***, **Korsi Dumenyo** and **Ali Taheri**, Tennessee State University, Nashville, Tennessee.

1-06 Industrial oilseed production in Tennessee for biodiesel and bio-based products. **Shivam Chawla***, **Jason P. de Koff** and **Prabodh Illukpitiya**, Tennessee State University, Nashville, Tennessee.

1-07 Field evolved insect resistance in Bt corn inbred and non Bt corn inbreds on Southwestern Corn Borer (*Lepidoptera: Crambidae*). **Hebron H. Smith*** and **Donald L. Sudbrink**, Austin Peay State University, Clarksville, Tennessee.

1-08 Day-length beans and corn in Tennessee. **Stephen Smith*** and **Donald L. Sudbrink**, Austin Peay State University, Clarksville, Tennessee.

1-09 Opportunity and real costs associated with feeder cattle health management: A Pilot Study. **Renee Stubblefield***, **Emalee Buttrey**, **Jason Roberts** and **J.E. Mehlhorn**, University of Tennessee – Martin, Martin, Tennessee.

1-10 Generating high-resolution profiles of histone methylated modification in *Panicum hallii* using ChIP-seq. **Shohana Huq*** and **Suping Zhou**, Tennessee State University, Nashville, Tennessee.

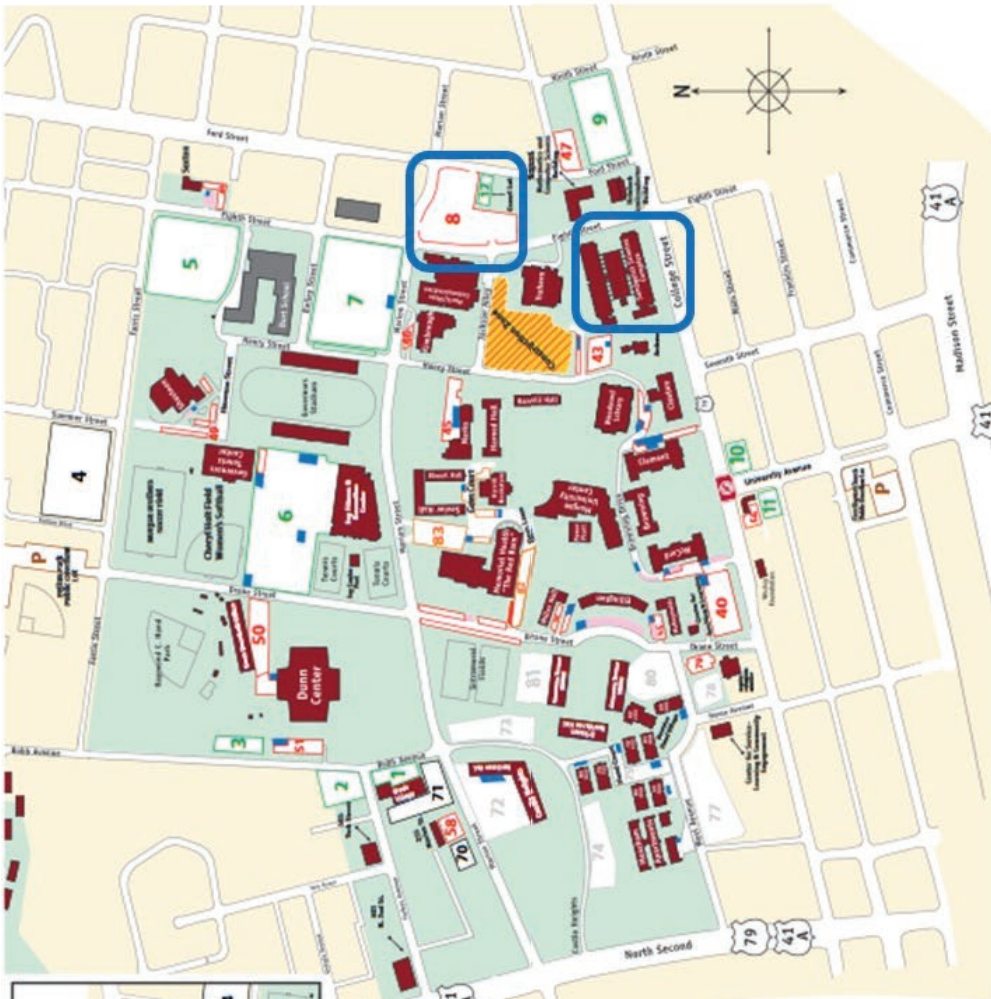
1-11 Why do Tennessee fruit and vegetable farmers hesitate for organic farming? **Kumuditha D HE Liyanage***, **Hiren Bhavsar** and **Md Niamul Kabir**, Tennessee State University, Nashville, Tennessee.

* student author

presenting author, if not first author

* student author

presenting author, if not first author



Park in Lot 8

Conference in the Sundquist Science Complex

PARKING

Lot numbers are for identification and location. Lot number and number color indicate the APSU permit required.

- Faculty & Staff Parking
- Residential Parking
- Residential Parking
- Commons, Emerald Hill & Two Rivers Parking
- ANY valid APSU permit
- P Public overflow lot, no APSU permit required
- Disabled Parking
- Visitor or 30-Minute Parking*

*Visitor and 30-minute parking spaces are indicated in pink for illustration purposes only and printed white with "Visitor" or "30 Minute" at each location.

1-12 Inactivation of food borne pathogens in milk using UV-C irradiation. **Danielle M. Gunter-Ward***, **Ankit Patras**, **Manreet Singh Bhullar**, **Agnes Kilanzo-Nthenge** and **Bharat Pokharel**.

Tennessee State University, Nashville, Tennessee.

1-13 Zoonotic risk: a study of crypto infection rates of cattle in Lincoln County Tennessee. **Aaron Helms*** and **Christina Galben**, *Austin Peay State University, Clarksville, Tennessee.*

1-14 Soil nitrogen and carbon levels in early- planted soybeans versus late-planted soybeans. **Liz Lillge***, **B. Darroch** and **P.M. Gale**, *The University of Tennessee at Martin, Martin, Tennessee.*

1-15 Effects of fungicide timing on soybean yield and yield components. **Kayley Tyner***, **Kacie Clark***, **Hailey Holcomb***, **Hope Renfro*** and **Barbara Darroch**. *University of Tennessee at Martin, Martin, Tennessee.*

1-16 Evaluation of inoculation methods and inoculum level of *Rhizoctonia solani* to determine disease response. **Prabha Liyanapathirana***, **Md Niamul Kabir**, **Terri Simmons** and **Fulya Baysal-Gurel**, *Tennessee State University, Nashville, Tennessee.*

1-17 Aluminum induced proteomics in Switchgrass. **Mahesh Rangu***, **Zhujia Ye**, **Sarabjit Bhatti**, **Suping Zhou** and **Theodore W. Thannhauser**, *Tennessee State University, Nashville, Tennessee, and Cornell University, Ithaca, New York.*

1-18 Influence of long-term furosemide use on bone mineral content, bone metabolism markers, and weigh loss in horses. **Abby Pritchard***, **Holly S. Spooner** and **Rhonda M. Hoffman**, *Middle Tennessee State University, Murfreesboro, Tennessee.*

1-19 Perceptions of welfare regulation at stock- type horse shows. **Andrea R. Rego**, **Holly S. Spooner** and **Rhonda M. Hoffman**, *Middle Tennessee State University, Murfreesboro, Tennessee.*

1-20 Effect of different levels of lysine on expression of genes associated with fat accretion in broiler chickens. **Boniface Kimathi***, **Samuel Nahashon** and **Thyneice Taylor**, *Tennessee State University, Nashville Tennessee.*

1-21 Evaluation of the potential of probiotics to increase phosphorus bioavailability and absorption in broilers. **Joseph Donkor***, **Samuel Nahashon**, and **Thyneice Taylor**, *Tennessee State University, Nashville Tennessee.*

1-22 Cover crop presence and its impact on red maple insect pests. **Sujan Dawadi***, **Karla M. Adesso**, **Jason B. Oliver** and **Paul O'Neal**. *Tennessee State University, Nashville, Tennessee.*

1-23 Patterns in imported fire ant size, geographical distribution, and hydrocarbon/venom alkaloid indices and the potential implications for biological control with phorid flies. **Manoj Pandey***, **Jason B. Oliver** and **Karla M. Adesso**, *Tennessee State University, Nashville, Tennessee.*

Botany Posters

2-01 Stimulation of plant growth by groundwater rich in sulfide. **Danelle Solomon***, **Melanie Kirtland** (*acknowledgement – T.D. Byl*), *Tennessee State University, Nashville, TN (DS), volunteer U.S. Geological Survey, Nashville, TN (MK)*

2-02 Phylogenetic, SEM, and anatomical analysis of *Viscainoa geniculata*. **J. Mark Porter** and **Silas C. Maynard***, *Claremont Graduate University, Claremont, California, and Tennessee Technological University, Cookeville, Tennessee.*

2-03 A study of *Croton setiger* Hook and its comparison with other species within genus *Croton*. **Elizabeth B. Jackson**, *Tennessee Technological University, Cookeville, Tennessee.*

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Cell and Molecular Biology Posters

3-01 Intrinsic characteristics of polyglutamine-containing htt protein determines proteotoxicity in *elegans*. **Hailey Ung***, *The University of the South, Seawanee, Tennessee.*

3-02 Interference of the heat shock response in *C. elegans* through neuronal expression of polyglutamine-expanded ataxin-3 protein. **Fridien Tchoukoua*, Hailey Ung and Elise Kikis**, *The University of the South, Seawanee, Tennessee.*

3-03 Identification of novel protein interactions with the transcription factor Six1. **Shannon Strader*, Zeynep Gromley and Adam Gromley**, *Lincoln Memorial University, Harrogate, Tennessee.*

3-04 Effects of neprilysin expression on stromal and breast cancer cell invasion, **Haley St. John* and Beth Conway**, *Lipscomb University, Nashville, Tennessee.*

3-05 Investigating the effect of super oxide dismutase, 6-hydroxydopamine and exogenous dopamine on the mobility of *Caenorhabditis elegans*. **Arielle Manabat*, Abby Rife* and Nick Ragsdale**, *Belmont University, Nashville, Tennessee.*

3-06 Seeking behaviors of nicotine on *C. elegans*. **A.J. Arnold and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-07 Disinhibition of *C. elegans* towards *Bacillus thuringiensis*. **Samantha Bush* and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-08 Insight into the chemotaxis of *Caenorhabditis elegans* toward pathogenic *Bacillus thuringiensis* Strain 4A4 using chemosensory deficient nematodes. **Stacey Crockett* and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-09 Effects on the motor movement of *Caenorhabditis elegans* after treatment with caffeine. **Madeline Johnson* and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-10 Chemotaxis of *Caenorhabditis elegans* with *Bacillus thuringiensis* 4A4 in vegetative and sporulated growth stages. **Meghan McGath* and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-11 Detection of respiration in *C. elegans* and the effect of different sugars. **Prisha S. Patel* and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-12 Caffeine's effect on chemotaxis of *C. elegans* at various stages of life. **Emily Shearon* and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-13 Expansion on the nematode scent detection test: evaluating *C. elegans* attraction to non-small cell lung cancer. **Brian R. Song and Robert Grammer**, *Belmont University, Nashville, Tennessee.*

3-14 A comparative analysis of microbial profile of chicken and Guinea fowl using metagenomic approach. **Sarayu Bhogaju*, S.Nahashon and X.Wang**, *Tennessee State University, Nashville, Tennessee.*

3-15 Annotation of the *Acidianus hospitalis* genome by undergraduate students using the GENI-ACT platform. **Steven Wall, Katelyn Armstrong, Megan Gardner, Ariana Whitley and Billy Dye**, *Volunteer State Community College, Gallatin, Tennessee.*

3-16 Annotation of hypothetical ORFs in the *Acidianus hospitalis* genome. **Braxton Dawson, Melissa Ortiz, Keri Buttrey and Billy Dye**, *Volunteer State Community College, Gallatin, Tennessee.*

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3-17 Impacts of Wnt Inhibitory Factor-1 (WIF-1) on the Differentiation of Preadipocytes and Inhibition of Wnt signaling suppresses cancer relapse. **Duaa Babaer* and Xiaofei Wang**, Tennessee State University, Nashville, Tennessee.

Chemistry Posters

4-01 Pd-catalyzed amination of 3-(6-Bromo-pyridin-2-yl)-5,6-diaryl-[1,2,4]triazine complexant scaffolds. **Jacob W. Cleveland* and Jesse D. Carrick**, Tennessee Technological University, Cookeville, Tennessee.

4-02 Synthesis of functionalized pyridinyl scaffolds towards the preparation of novel metal thiosemicarbazone complexes as potential DNA topoisomerase-II inhibitors. **Ryan P. Downs* and Jesse D. Carrick**, Tennessee Technological University, Cookeville, Tennessee.

4-03 Measurement of methane and carbon dioxide concentration levels in ambient air in Cookeville region using cavity-ring-down spectrometric technique. **Lahiru Gamage* and Wilson K. Gichuhi**, Tennessee Technological University, Cookeville, Tennessee.

4-04 Progress toward the design and construction of a low-cost raman spectrometer. **Amber Taylor*, Rebecca Bloodworth*, Richard Diegan*, Krysten Harris*, Layla Gargus, Dwight Johnson III, Drake Williams*, Casey Vincent and Jason Alexander**, University of Tennessee at Martin, Martin, Tennessee.

4-05 Lycopene in watermelon. **Becca Rae Campbell**, Austin Peay State University, Clarksville, Tennessee.

4-06 Machine learning predictions of carbonyl reactivity and spectroscopic properties from a database of charge density descriptors. **Kiran K. Donthula and Preston J. MacDougall**, Middle Tennessee State University, Murfreesboro, Tennessee.

4-07 Fluorescence assay analyzing the oxidative properties of nicotine. **Dillon Burrow*, Leslie A. Hiatt and Meagan K. Mann**, Austin Peay State University, Clarksville, Tennessee.

4-08 Uric acid sensing with multi-walled carbon nanotubes modified with zinc oxide nanoparticles and enzymes. **Robert J. Baltz* and Charles C. Chusuei**, Middle Tennessee State University, Murfreesboro, Tennessee.

4-09 A simple assay for nicotine: electrochemical characterization of electronic cigarettes. **Allison N. Schmittou*, Brianna C. Avitabile*, Leslie A. Hiatt and Meagan K. Mann**, Austin Peay State University, Clarksville, Tennessee.

4-10 Quantification of nicotine concentration in electronic cigarettes. **Jacob L. Williams*, Martin E. Miller, Allison N. Schmittou, Leslie A. Hiatt and Meagan K. Mann**, Austin Peay State University, Clarksville, Tennessee.

Ecology and Environmental Science Posters

5-01 Enhancement of cellulosic herbaceous perennials grown to reclaim coal mine soil. **Ekundayo Adeleke* and Kudjo Dzantor**, Tennessee State University, Nashville, Tennessee.

5-02 Understory vegetation comparisons between altered and unaltered sites within the low gradient floodplains in MLRA 134. **Amber Gardiner*, Lisa M. Krueger and Paula M. Gale**, University of Tennessee at Martin, Martin, Tennessee.

5-03 The effects of fertilizer on decomposition of native and invasive exotic plant species. **Gary W. Noel* and A. Darlene Panvini**, Belmont University, Nashville, Tennessee.

5-04 Decomposition rates of *Acer saccharum* and *Lonicera maackii* in mixed litter bags. **Anna Anderson* and A. Darlene Panvini**, Belmont University Nashville, Tennessee.

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5-06 Conservation genetics of the endangered barrens topminnow. **Alexis Harman***, **Natalie Ellis*** and **Carla Hurt**, *Tennessee Technological University, Cookeville, Tennessee.*

5-07 Environmental monitoring of rare freshwater fishes using next-generation sequencing. **Austin L. Ivey***, **Robert T. R. Paine*** and **Carla Hurt**, *Tennessee Technological University, Cookeville, Tennessee.*

5-08 Evaluation of madtom diurnal substrate use in the Clinch River, Tennessee. **Sara Kenney***, **Grady Wells***, **Jeannette Wolak** and **Hayden Mattingly**, *Tennessee Technological University, Cookeville, Tennessee.*

5-09 Aquatic turtle biodiversity of an urbanized wetland in Nashville Tennessee. **Brittaney Hogan***, **Dominique Harris***, **Nicole Witzel***, **Jeronimo Silva***, **Brent Newman***, **Laura Horton*** and **William Sutton**, *Tennessee State University, Nashville, Tennessee (BH, DH, NW, JS, BN, and WS), and Belmont University, Nashville, Tennessee (LH).*

5-10 Occurrence and relative abundance of parasitic leeches (Hirudinea) on aquatic turtles in a wetland environment in Tennessee. **Laura Horton***, **Nicole Witzel***, **Jeronimo Silva***, **Brittaney Hogan***, **Dominique Harris** and **William Sutton**, *Tennessee State University, Nashville, Tennessee (NW, JS, BH, WS), and Belmont University, Nashville, Tennessee (LH).*

5-11 Seasonal variations and statistical analysis of the physicochemical characteristics in a developing wetland in Nashville, Tennessee. **Mark C. Okafor***, **De'etra Young** and **Thomas D. Byl**, *Tennessee State University, Nashville, Tennessee.*

5-12 Distribution of sea urchin density and community structure in different habitats along the northeastern coast of Trinidad. **Markeyta Bledsoe*** and **Stanton G. Belford**, *Martin Methodist College, Pulaski, Tennessee.*

5-13 Aggregation tendencies of female *Vaejovis carolinianus* populations on France Mountain, Tennessee. **Bob A. Baggett***, **Hannah E. Ritter*** and **Margaret E. Melendez***, *Tennessee Technological University, Cookeville, Tennessee (BB, HR), and Middle Tennessee State University, Murfreesboro, Tennessee (MM).*

5-14 Development of an eDNA sampling protocol to identify streamside salamander (*Ambystoma barbouri*) populations in Middle Tennessee. **Nicole Witzel*** and **William B. Sutton**, *Tennessee State University, Nashville, Tennessee.*

5-15 Investigating the effect of pesticides on soil microbe cultures. **Ashleigh Roeser***, **Emily Best***, **Ali Green***, **Araceli Lopez***, **Sequene Mccollough***, **Taylor Orr*** and **John P. DiVincenzo**, *Middle Tennessee State University, Murfreesboro, Tennessee.*

5-16 Comparison between established versus newly created green roofs focusing on microbiology, macroinvertebrates and green roof flora. **Kelsey Saint Clair***, **Chris Barton** and **A. Darlene Panvini**, *Belmont University, Nashville Tennessee.*

5-17 Differences in plant, macroinvertebrate, and microbiota diversity on a well-established green roof and a new green roof. **Sargoel Rezanejad***, **Chris Barton** and **A. Darlene Panvini**, *Belmont University, Nashville, Tennessee.*

Engineering and Engineering Technology Poster

6-1 In-process void detection with magneto-elastic rate of change torque sensor. **Thomas Ruland*** and **William Longhurst**, *Austin Peay State University, Clarksville, Tennessee.*

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Geology and Geography Posters

7-1 In the face of danger: applying fundamental meteorological concepts to an emergency management simulation. **T. Binkley*** and **C. Karmosky**, *The University of Tennessee at Martin, Martin, Tennessee, and State University of New York College at Oneonta, Oneonta, New York.*

7-2 Hydrology of an urban wetland at Tennessee State University. **JeTara Brown*** and **Lonnie Sharpe (acknowledgement-Tom Byl)**, *Tennessee State University, Nashville, Tennessee (JTB, LS), U.S. Geological Survey, Nashville, Tennessee (TB).*

7-3 Road curvature analysis for building a motorcycle route. **Samuel Dotson***, **Benjamin Drury** and **Peter Li**, *Tennessee Technological University, Cookeville, Tennessee.*

7-4 Water quality monitoring along streams and tributaries in the Roaring River watershed, Overton and Jackson counties Tennessee. **Wesley D. Flatt*** and **Peter Li**, *Tennessee Technological University, Cookeville, Tennessee.*

7-5 Radon gas present in karst areas. **Alexander Nicely*** and **Jon R. Zetterberg**, *Tennessee Technological University, Cookeville, Tennessee.*

7-6 Identification and classification of dominant daily weather patterns in Greenland using a temporal synoptic index. **J. A. Reasons***, **B. W. Griffin*** and **C. Karmosky**, *University of Tennessee at Martin, Martin, Tennessee; State University of New York at Oneonta, Oneonta, New York.*

7-7 The Earth hemispheres and their average elevations. **A. Tan**, **A. Alomari*** and **M. Schamschula**, *Alabama A & M University, Normal, Alabama.*

7-8 The principle of isostasy applied to land and water hemispheres of the Earth. **A. Tan**, **A. Alomari*** and **M. Schamschula**, *Alabama A & M University, Normal, Alabama.*

Health and Medical Science Posters

8-1 Homemade vegan and gluten-free breakfast bars. **Corinna Rankin***, **Dominique Gibbs** and **Tara Sexton**, *The University of Memphis, Tennessee.*

8-2 Convallatoxin induces apoptosis in HCT116 colorectal cancer cells. **Sarah Anderson*** and **Chris Barton**, *Belmont University, Nashville, Tennessee.*

8-3 Effects of arsenic trioxide (As₂O₃) on the *in vitro* release of thyroxine from incubated bullfrog (*Lithobates catesbiana*) thyroid glands. **Emily A. Ely*** and **Dominic L. Palazzolo**, *Lincoln Memorial University-DeBusk College of Osteopathic Medicine, Harrogate, Tennessee.*

8-4 Effects of epigallocatechin-gallate and enoxacin on HeLa cells. **Anna Margaret McDonnell*** and **Chris Barton**, *Belmont University, Nashville, Tennessee.*

8-5 Nicotine in electronic cigarette refill solutions (E-liquids): a comparison of five brands of refill solutions purchased locally. **Zuri Hudson***, **John Nelson** and **Dominic L. Palazzolo**, *Lincoln Memorial University-DeBusk College of Osteopathic Medicine, Harrogate, Tennessee.*

8-6 Investigation of p53 activation in HCT116 with the sesquiterpene Beta-Caryophyllene. **Diana S. Neculcea*** and **Chris Barton**, *Belmont University, Nashville, Tennessee.*

8-7 Confronting otherness in a health care educational setting. **T. L. Smith**; **C. A. Ralston***, and **C. Ewing***, *School of Health Studies, The University of Memphis, Memphis, Tennessee.*

8-8 Assessment of anti Herpes activity in *Bidens biternata* and *Mangifera persiciformis*. **Darcy V. Tabotabo*** and **Stephen M. Wright**, *Middle Tennessee State University, Murfreesboro, Tennessee.*

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8-9 Treatment effects of emetine on HCT-116 cells. **Kerry Sommers* and Chris Barton**, Belmont University, Nashville, Tennessee.

8-10 Factors associated with postpartum contraceptive choice. **Elly Riley, Michael Fister*, Claire Pendergrass*, Emily Tower*, John White, Saurabh Sachan and Dustin Temple**, University of Tennessee Health Science Center, Memphis, Tennessee.

8-11 Identification of Amidase negative strains of *Bacillus thuringiensis*. **Sarah Filfilan*, Anthony Ejiofor and Terrance Johnson**, Tennessee State University, Nashville, Tennessee.

8-12 NFAT5/STAT3 Interaction Mediates Synergism of High Salt with IL-17 towards Induction of VEGF-A Expression in Breast Cancer Cells. **Suneetha Amara, Dalal Alotaibi and Venkataswarup Tiriveedhi***, Mercy Hospital, St. Louis, Missouri; Tennessee State University, Brentwood, Tennessee; Tennessee State University, Nashville, Tennessee.

History of Science No poster presentations

Math and Computer Science No poster presentations

Microbiology Posters

9-1 Identification of amidase negative strains of *Bacillus thuringiensis*. **Sarah Filfilan*, Anthony Ejiofor and Terrance Johnson**, Tennessee State University, Nashville, Tennessee.

9-2 Characterization of poly-3-hydroxybutyrate (PHB) produced by *Bacillus cereus* tsu1 using rapeseed cake substrate. **Hui Li* and Suping Zhou**. Tennessee State University, Nashville, Tennessee.

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9-3 Cloning and characterization of multifunctional cellulolytic enzymes screened from metagenomic resources representing ruminal bacteria in the goat. **Santosh Thapa, Hui li, Sarabjit Bhatti and Suping Zhou**, Tennessee State University, Nashville, Tennessee.

9-4 Possibility of toxic indole production by bacteria in human guts. **Emily Alyse Wysocki*, Emery White* and Sergei A. Markov**, Austin Peay State University, Clarksville, Tennessee.

Physics and Astronomy Posters

10-1 Preparation and characterization of spin coated arsenic selenide thin films. **Maria V.White*, Caity Thomas*, Joshua Allen*, Jonathan Bunton* and Andriy Kovalskiy**, Austin Peay State University, Clarksville, Tennessee.

10-2 Comparison of photo-response of thermally deposited and spin-coated arsenic sulphide thin films. **Josh Allen*, Jonathan Bunton*, Caity Thomas*, Maria White*, Stanislav Slang, Miroslav Vicek, Tetyana Ignatova and Andriy Kovalskiy**, Austin Peay State University, Clarksville, Tennessee, (JA, JB, CT, MW, AK) University of Pardubice, Pardubice, Czech Republic (SS, MV) and Lehigh University, Bethlehem, Pennsylvania (TI).

10-3 Fluorescence of Er-doped CsCl-Ga-Ge-S glasses for IR applications. **Jonathan Bunton*, Oleh Shpotyuk, Laurent Calvez and Roman Golovchak**, Austin Peay State University, Clarksville, Tennessee (JB, RG), Jan Dlugosz University, Czestochowa, Poland (OSh), Université de Rennes, Rennes Cedex, France (LC).

10-4 Fluorescence of Pd-doped Ti:CMAS glass and ceramics. **L. Nichols* and R. Golovchak**, Austin Peay State University, Clarksville, Tennessee.

10-5 Electromagnetic pump comprised of common off-the-shelf components to displace a salt-water solution. **Cade T. Friedland*, J. Alexandra Keith* and William R. Longhurst**, Austin Peay State University, Clarksville, Tennessee.

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10-6 Developing a flat field system for Austin Peay State University's 20-inch telescope. **Richard Borges***, **Thomas Ruland*** and **J. Allyn Smith**, Austin Peay State University, Clarksville, Tennessee.

10-7 Spectroscopic reductions of white dwarf stars to support dark energy survey calibrations. **Deborah J. Gulledge***, **Jacob M. Robertson***, **Douglas L. Tucker**, **J. Allyn Smith**, **William Wester III**, **Pier-Emmanuel Tremblay** and **Mees Fix**, Austin Peay State University, Clarksville, Tennessee (DJG, JAS, JMR). Fermi National Accelerator Laboratory (DLT, WW). University of Warwick, Coventry, England (PET). Space Telescope Science Institute, Baltimore, Maryland (MF).

10-8 Discovery of a new quasar: SDSS J022155.26-064916.6. **Jacob M. Robertson***, **J. Allyn Smith#**, **Douglas L. Tucker**, Huan Lin, **Deborah J. Gulledge*** and **Mees B. Fix**, Austin Peay State University, Clarksville, Tennessee (JMR, JAS, DJG), Fermi National Accelerator Laboratory, Batavia, Illinois (DLT, HL), and Space Telescope Science Institute, Baltimore, Maryland (MBF).

10-9 Fitting multi-periodicity in variable stars, a comparison of fitting programs, **Geoffrey S. Burks*** and **Gregory W. Henry**, Tennessee State University, Nashville, Tennessee.

Science and Mathematics Teaching Posters

11-1 Astronomical methods and instrumentation involved in determining velocity dispersion and metallicity for globular clusters. **Jo Lynn Tyner*** and **Christopher McDonald***, Austin Peay State University, Clarksville, Tennessee.

11-2 Addressing civic issues of unpreparedness for natural hazards in Tennessee. **Marilyn A. Kelley**, **Samuel M. Musili**, **Mark Abolins** and **Judith Iriarte-Gross**, Middle Tennessee State University, Murfreesboro, Tennessee.

11-3 Middle Tennessee State University ADVANCE: spotlight on changing the institutional culture to improve the recruitment, retention, and advancement of women STEM faculty. **Judith Iriarte-Gross**, **Brad Bartel**, **Wandi Ding**, **Jackie Eller**, **Karen Petersen**, **Michael Hein**, **Gretchen Webber** and **Denielle Meyerink**, Middle Tennessee State University, Murfreesboro, Tennessee

Zoology Posters

12-1 The correlation of bat activity and bat species richness with insect abundance and insect diversity at an urban pond vs. at a rural pond in Weakley County, Tennessee. **J. Rowdy Englert***, **Jack Grubaugh** and **Nancy Buschhaus**, University of Tennessee at Martin, Martin, Tennessee.

12-2 Wildlife use of livestock water troughs. **Russell Milam***, **Dan Taylor**, **Stuart Tuttle**, **Marcus Miller** and **Nancy Buschhaus**, University of Tennessee at Martin, Martin, Tennessee (RM, NB), Bat Conservation International, Austin, Texas (DT), and USDA National Resources Conservation Service (ST, MM).

12-3 A comparison of bat activity at an urban and a rural pond in northwest Tennessee. **Brittany Woodard***, **Catherine Hixson*** and **Nancy Buschhaus**, University of Tennessee at Martin, Martin, Tennessee.

12-4 An unusual intermediate host in the life cycle of a shark cestode. **Jason Payne** and **John Gunderson**, University of Mississippi, Oxford, Mississippi (JP) and Tennessee Technological University, Cookeville, Tennessee (JG).

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12-5 Genetic evaluation of the historical distribution of *Thomomys bottae* and *Thomomys talpoides* in California. **Brittany Pope, Caprice Hebert*, William Drees, Gary Nickelberry, Meagan Gilliam, Numalee Sisuse, Tamika Jamison, Juliann L. Waits, Roger Baldwin and Michael L. Kennedy**, *The University of Memphis, Memphis, Tennessee (BP, MLK), Southwest Tennessee Community College, Memphis, Tennessee (CH, WD, GN, MG, NS, TJ, JLW), and The University of California - Davis, Davis, California (RB).*

12-6 Do flower naïve *Manduca sexta* sphinx moths forage using chromatic or achromatic vision to select a potential feeding source? **Jonathan Travis*, William Kuenzinger*, Jordan Weesner* and Joaquín Goyret**, *University of Tennessee at Martin, Martin, Tennessee.*

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