









# 103rd ANNUAL MEETING

**Murray State University  
Murray, Kentucky  
November 3-4, 2017**



**KAS - 103 Years Serving Kentucky**

# Sponsors

<b>Platinum Level</b>	ASRC Michelin	
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<b>Break Sponsors</b>	Hancock Biological Station on Kentucky Lake  Sullivan University College of Pharmacy	 
<b>In Kind</b>	Kentucky Science Center	

# Exhibitors

**KBRIN (Kentucky Biomedical Research Infrastructure Network)**

**Kentucky Organization of Field Stations**

**Kentucky State University College of Agriculture, Food and Sustainable Systems**

**University of Kentucky Chemistry Department**

**University of Kentucky Graduate School**

**Murray State University**

**Summer Undergraduate Research in Pharmacology and Environmental Health Sciences - University of Kentucky**

**Ky Mesonet at Western Kentucky University**

## WELCOME TO MURRAY STATE UNIVERSITY



Murray State University welcomes the Kentucky Academy of Science to Murray for its 103rd annual meeting. The westernmost of Kentucky's regional comprehensive universities is known for its high-quality academic programs and warm hospitality. The university has grown to more than 10,000 students on the main campus in Murray and our regional campuses in Paducah, Hopkinsville, Madisonville, and Henderson. Many of these students are pursuing degree programs in the Jesse D. Jones College of Science, Engineering and Technology, which is comprised of six academic departments: Biological Sciences, Chemistry, Geosciences, Mathematics and Statistics, Occupational Safety and Health, and the MSU Institute of Engineering.

Our college is proud to showcase the three newest academic buildings on campus, all of which will be on display for conference attendees. The Biological Sciences building was completed in 2007, followed in 2009 by Jesse D. Jones Hall, home of our Department of Chemistry. The Engineering and Physics building opened in 2017. Each facility is equipped with state-of-the-art instrumentation and together they provide more than 150,000 square feet of comfortable, modern instructional and research space for faculty and students in those disciplines. They are joined by the Jones Family Clock Tower, a beautiful structure that has already become an iconic part of the Murray State landscape. In addition to our academic buildings, we are proud to be home to a number of prestigious scientific research centers. The Watershed Studies Institute, a Commonwealth Center of Excellence, coordinates multidisciplinary research and educational initiatives that focus on water-related ecological systems. Hancock Biological Station (HBS), located less than 20 minutes from the campus on Kentucky Lake, is a year-round teaching and ecosystem research facility where students have unique opportunities to interact with faculty and visiting scientists. The Mapping Applications Resource Center is involved in teaching, research, and service to the region in the fields of remote sensing and GIS. The Chemical Services Laboratory provides analytical and environmental services to individuals, corporations, agencies and other institutions in the mid-south region.

Murray State University is committed to its educational mission in expanding opportunities in the sciences to the citizens of our commonwealth. We are pleased to support the Kentucky Academy of Science as host of this year's annual meeting, and pledge our continued dedication to the achievement of our mutual goals. Our local arrangements committee has worked to provide the Academy with a comfortable and convenient venue for its meeting. If we can be of any assistance to you, please let us know. Best wishes for an enjoyable and productive meeting.

*Steve Cobb, Dean  
Murray State University  
Jesse D. Jones College of Science, Engineering and Technology*

# KENTUCKY ACADEMY OF SCIENCE

103rd Annual Meeting  
November 3 - 4, 2017  
Murray State University

## GOVERNING BOARD EXECUTIVE COMMITTEE

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## DIVISION REPRESENTATIVES AND AT-LARGE MEMBERS

2017 - Biological Sciences ..... **Michael Fultz**, *Morehead State University*  
2019 - Biological Sciences ..... **Maggie Whitson**, *Northern Kentucky University*  
2018 - Physical Sciences ..... **Richard Gelderman**, *Western Kentucky University*  
2017 - Physical Sciences ..... **R. Douglas Chatham**, *Morehead State University*  
2018 - Social & Behavioral Sciences..... **Kerrie McDaniel**, *Western Kentucky University*  
2017- Social & Behavioral Sciences ..... **Gregory Corso**, *Morehead State University*  
2017 - At - Large..... **Mary Janssen**, *KCTCS*  
2019 - At - Large..... **Tracy Hodge**, *Berea College*

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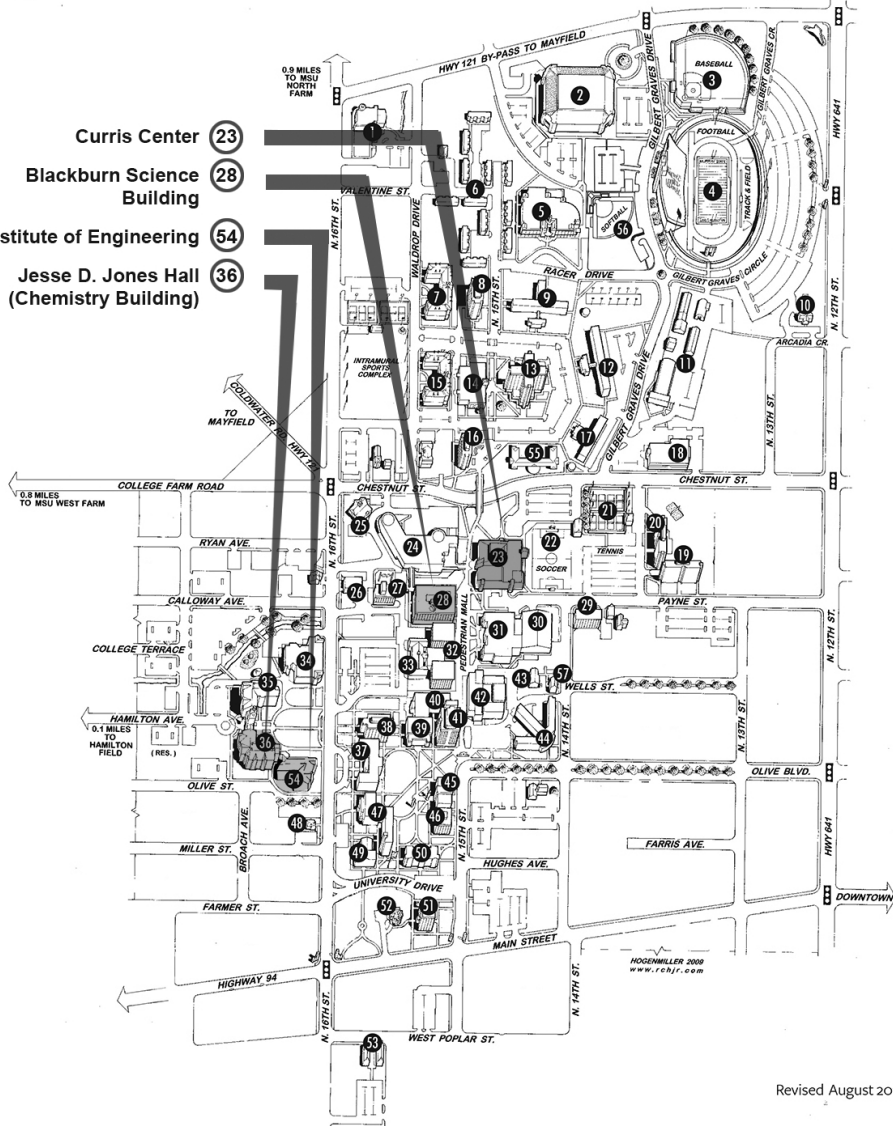
# MAP OF MURRAY STATE UNIVERSITY



## MURRAY STATE UNIVERSITY



- Curriss Center (23)
- Blackburn Science Building (28)
- Institute of Engineering (54)
- Jesse D. Jones Hall (Chemistry Building) (36)



Revised August 2017

**Murray State Parking & Navigation:** Please carpool with colleagues!  
 We add an average of 19.6 pounds of CO<sub>2</sub> to the atmosphere for each gallon of gas we consume!

## **WELCOME AND KEYNOTE**

Saturday, November 4, 2016  
3:00 pm - 4:00 pm, Curris Center Ballroom

### **Welcome**

Dr. Darrin Smith, KAS President  
Eastern Kentucky University

Dr. Mark Arant, Vice President for Academic Affairs /  
Provost, Murray State University

### **Presiding**

Dr. Jennifer Birriel, KAS President-Elect  
Morehead State University

### **Keynote Presenter**

**Dr. Jeffrey Bennett**

## **“Communicating Science to the Public”**



Jeffrey Bennett holds a B.A. in Biophysics from the University of California at San Diego and an M.S. and Ph.D. in Astrophysics from the University of Colorado at Boulder. He specializes in mathematics and science education, writing for and speaking to audiences ranging from elementary school children to college faculty. His extensive teaching experience, which spans all levels from preschool through graduate school, includes having founded and run a private science summer school for elementary and middle school children and teaching more than fifty college classes in astronomy, physics, mathematics, and education. He has received numerous awards for his teaching and writing, including the American Institute of Physics Science Communication Award.

Among his other major endeavors, Dr. Bennett served two years as a Visiting Senior Scientist at NASA Headquarters, where he was the first scientist hired within a science division specifically to leverage science missions for education. Working closely with

Continued, page 6

NASA’s Education Division and teams working with the Hubble Space Telescope and other science missions, he was credited with helping bridge the cultural divide between education and science. In addition, he created the Initiative to Develop Education through Astronomy (originally IDEA, later called IDEAS), developed the Perspectives From Space concept (and creating its poster set) that was ultimately adopted as the global theme for International Space Year, and helped start the program known as Flight Opportunities for Science Teacher EnRichment (FOSTER), which flew teachers on the Kuiper Airborne Observatory and evolved to become the Airborne Astronomy Ambassadors program that now flies teachers on the SOFIA airborne observatory.

Perhaps his most visible achievements have been his work in developing educational scale models of the solar system. He proposed the idea for and helped develop both the Colorado Scale Model Solar System (on the University of Colorado campus) and the Voyage Scale Model Solar System on the National Mall in Washington, DC. The Voyage model is now being replicated (through the Voyage National Program) in many other cities around the United States.

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## 2017 Local Arrangements Committee Murray State University

Annie Dail

Angela Guyton

Kevin Revell

Oliver Beckers

Gerry Harris

Carl Woods

Steve Cobb

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### STAY CONNECTED WITH KAS



**Wi-Fi Network:** Visitors can connect to “Murray State Guest ” by selecting it from the list of available networks. Open your web browser and you will need to enter your email address and agree to the terms of use.



**Facebook :** Follow the Kentucky Academy of Science



**Tweet** about the 2017 annual meeting at #KAS2017



## SYMPOSIUM

Saturday, Nov 4, 2017, 4:00-5:00pm  
Curris Center Ballroom

Moderator: Wilson Gonzalez-Espada

### “Out in the Field: Experiences Communicating Science to the Public”

Panelists will include:



**Dr. Jeffrey Bennett**

Astronomer, Teacher, Writer



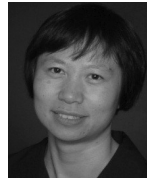
**Kim Hunter**

Chief Program Officer at the  
Kentucky Science Center



**Richard Gelderman**

Professor of Physics at WKU,  
recipient of 2016 KAS Science  
Education & Outreach Award



**Robin Q. Zhang, Ph.D.**

Professor and Chair, Department  
of Geosciences, Murray State  
University



**David White**

Commonwealth Endowed Chair,  
Professor, Biological Sciences  
& Director, Hancock Biological Station  
[www.murraystate.edu/hbs](http://www.murraystate.edu/hbs)



**Gerry Harris**

Hancock Biological Station, Murray  
State University

**PROGRAM SUMMARY****FRIDAY, NOVEMBER 3**

1:00pm - 3:00pm	KAS Board meeting (open to all KAS members) ..... <i>Commonwealth Suite</i>
3:00 pm	Registration Open ..... <i>Rocking Chair Lounge, Curris Center</i>
3:00 pm	Section Leaders and Judges Meeting ..... <i>Stables, 1st Floor of the Curris Center</i>
3:00 pm - 5:00 pm	Tour - Hancock Biological Station 2 hour round trip..... <i>Meet in front of Curris Center for van pickup.</i>
3:00 pm - 9:30 pm	Practice Rooms for Oral Presentations..... <i>Tennessee Room and Cumberland Room, Curris Center</i>
4:00 pm - 5:00 pm	Tour - Mapping Applications and Resource Center (MARC) ..... <i>Meet outside of Blackburn 425</i>
4:00 pm - 5:00 pm	Tour - New Institute of Engineering facility ..... <i>Meet in the lobby</i>
4:00 pm - 5:00 pm	Tour - Chemistry Building ..... <i>Meet in the lobby</i>
4:00 pm - 5:00 pm	KAS Business meeting ..... <i>Mississippi Room, Curris Center</i>
4:00 pm - 5:00 pm	Poster Check In ..... <i>3rd Floor Curris Center</i>
5:00 pm - 8:00 pm	Friday night Poster Party & Social Hour ..... <i>Curris Center</i>

**FRIDAY EVENING - POSTER SESSIONS**

5:00 pm - 8:00 pm	Agricultural Sciences ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Botany ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Cellular & Molecular Biology..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Chemistry Analytical/Physical ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Chemistry Organic/Inorganic ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Computer & Information Sciences ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Ecology & Environmental Sciences..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Engineering ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Geography ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Geology ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Health Sciences ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Microbiology ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Physics & Astronomy..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Physiology & Biochemistry ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Psychology ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Science Education ..... <i>Curris Center</i>
5:00 pm - 8:00 pm	Zoology ..... <i>Curris Center</i>
8:30 pm -11:00 pm	Biology Social..... <i>Corvette Lanes, 1415 Main St.</i>

**SATURDAY, NOVEMBER 4**

7:30 am	Registration opens..... <i>Curris Center</i>
7:30 am- 10:30 am	Coffee and Tea Locations..... <i>Crows Nest, Curris Center and 2nd floor lobby, Blackburn</i>
7:30 pm - 12:00 pm	Practice Room for Oral Presentations..... <i>Cumberland Room, Curris Center</i>

7:30 pm - 2:30 pm	Practice Room for Oral Presentations..... <i>Tennessee Room, Curris Center</i>
9:00 am - 3:00 pm	Exhibitors ..... <i>3rd floor Curris Center</i>
9:30 pm - 10:30 am	Morning Breaks

### SATURDAY MORNING - ORAL PRESENTATIONS

8:00 am - 12:00 pm	Agricultural Sciences ..... <i>The Stables, Curris Center 1st floor</i>
8:15 am - 10:00 am	Chemistry Analytical/Physical ..... <i>Blackburn 320</i>
8:00 am - 11:30 am	Cellular & Molecular Biology ..... <i>Barkley Lecture Room, Curris Center</i>
8:00 am - 12:00 pm	Ecology & Environmental Science ..... <i>Curris Center Theatre</i>
8:30 am - 11:00 pm	Geography ..... <i>Mississippi Room, Curris Center</i>
9:00 am - 11:00 am	Geology ..... <i>Blackburn 228</i>
9:00 am - 11:00 am	Psychology ..... <i>Blackburn 155</i>
10:00 am - 11:00 am	Engineering ..... <i>Ohio Room, Curris Center</i>
8:00 am - 11:30 am	Physics & Astronomy..... <i>Blackburn 312</i>
9:00 am - 11:00 pm	Science Education ..... <i>Blackburn 249</i>
12:00 pm - 1:00 pm	Lunch -on your own or box lunch ( <i>Pick up preordered box lunches in Rocking Chair lounge</i> )
12:00 pm - 1:00 pm	Mentor-Matching ..... <i>Winslow Dining Hall</i>
1:00 pm - 2:45 pm	KAS-KCTCS Science Faculty meeting ..... <i>Blackburn 249</i>

### SATURDAY AFTERNOON - ORAL PRESENTATIONS

1:00 pm - 2:00 pm	Agricultural Sciences ..... <i>The Stables, Curris Center 1st floor</i>
1:00 pm - 2:00 pm	Anthropology/Sociology ..... <i>Ohio Room, Curris Center</i>
1:00 pm - 1:15 pm	Botany ..... <i>Mississippi Room, Curris Center</i>
1:00 pm - 2:30 pm	Chemistry – Organic & Inorganic ..... <i>Blackburn 135</i>
1:00 pm - 2:15 pm	Computer & Information Sciences ..... <i>Blackburn 312</i>
1:00 pm - 2:30 pm	Ecology & Environmental Science ..... <i>Curris Center Theatre</i>
1:00 pm - 1:30 pm	Health Sciences ..... <i>Blackburn 155</i>
1:00 pm - 2:00 pm	Mathematics ..... <i>Blackburn 228</i>
1:00 pm - 1:45 pm	Microbiology ..... <i>Cumberland Room, Curris Center</i>
1:00 pm - 2:00 pm	Physiology & Biochemistry ..... <i>Barkley Lecture Room, Curris Center</i>
1:15 pm - 2:30 pm	Zoology ..... <i>Mississippi Room, Curris Center</i>
2:30 pm - 3:00 pm	Poster Removal ..... <i>Curris Center</i>
2:30 pm - 4:30 pm	Coffee & Tea..... <i>Crows Nest, Curris Center</i>
3:00 pm - 4:00 pm	Keynote by Global Warming Primer author Jeffrey Bennett. Reception with Dr. Jeffrey Bennett and KAS Science Communicators ..... <i>Curris Center Ballroom</i>
4:00 pm - 4:15 pm	Reception and Presentation of 2017 Science Education and Outreach Award..... <i>Curris Center Ballroom</i>
4:15 pm - 5:15 pm	Symposium: Out in the Field: Experiences Communicating Science to the Public..... <i>Curris Center Ballroom</i>

# Mentor matching: Looking for a future graduate advisor?

Winslow Dining Room at noon Saturday

If you are a biology undergraduate/graduate student and looking for a future biology advisor for your M.S. or Ph.D., please come to Winslow dining on Saturday at lunch time. Biology faculty who are interested in recruiting students will be present in the cafeteria (look for signs on the tables) and will be happy to talk to you about possibilities in their labs.



## Friday Night Biology Social

*Let's get to know each other  
a bit better.*



Biologists of all disciplines (including students), join us for a round of bowling, arcade games, and/or drinks at Corvette lanes at 8:30pm.

1415 Main Street - in close walking distance!

Bowling specials for some of the first bowlers in line!

## Friday Field Trips and Outings

**3:00 pm: Hancock Biological Station** - The Hancock Biological Station (HBS), located on Kentucky Lake less than 20 minutes from the campus, is a year-round teaching and research ecosystem facility where students have unique opportunities to interact with faculty and visiting scientists. A variety of field courses are taught each summer at the Station. Meet in front of Curris Center for van pickup. 2 hour round trip returning to Curris Center at 5pm.

**4:00 pm: Biology Building** - was completed in 2008. It houses 7 teaching labs, several lecture spaces, 12 research labs, office space, the Herbarium, Animal Collection, Animal Care Facility and a Molecular Biology Facility. Additional Biology teaching and research spaces are located in Jones Hall (Chemistry) and the new Engineering Physics Buildings. Meet in the lobby.

**4:00 pm: MARC/Geosciences** - The tour will bring conference attendees to the Mapping Applications and Resource Center (MARC) on the 4th floor of the Blackburn Science Building. We will show our computer classrooms, large-format scanners and printers, and GPS equipment for geospatial technologies. The participants will visit our Terrain Modeling Lab that houses a stream table, an augmented reality sandbox, and a 3D printer. They will also visit our Environmental Monitoring and Modeling lab. We will meet in the 4th floor hallway on the east side of Blackburn, outside of computer classroom 425.

**4:00 pm: New Institute of Engineering facility** - The Engineering and Physics building was completed in 2017 and houses the Institute of Engineering – mainly programs in Engineering Physics (Mechanical Engineering, Electrical Engineering, Biomedical Instrumentation and Aerospace Engineering) and Physics. Student laboratory spaces associated with these programs include: Physics electricity and magnetism, Physics mechanics, circuits, fluid mechanics, standards/measurement, senior design, rapid prototype, optics, astronomy, and the high-bay research and development lab. In addition, there are lab and research spaces for Biology and Chemistry. Engineering and Physics faculty have dedicated research labs to include: solid state Physics, advanced Physics, astrophysics, swarm systems, automated manufacturing, non-destructive testing, thermos-fluid energy devices, power systems, and laser and photonics. Meet in the lobby.

**4:00 pm: Chemistry Building** - In May 2009, the Department of Chemistry moved into the newly constructed Jesse D. Jones Hall. In our main entryway we feature a Living Periodic Table, built by Mr Jim Barnett, displaying many samples of actual elements. The Chemical Services Laboratory provides state of the art chemical analytical services and expertise in the areas of Environmental Analysis, Organic Synthesis, Inorganic Substance Analysis, Controlled Substance Analysis, Bioassay & Bio-analytical Techniques and much more!



*Kentucky Academy of Science*

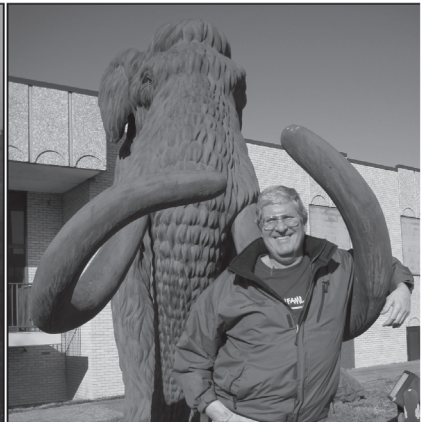
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For more information, see the webpage:  
[https://www.kyscience.org/about\\_our\\_publications.php](https://www.kyscience.org/about_our_publications.php)



**Kelly Watson**



**Walter Borowski**

**OK, you've presented  
your work at KAS,  
so why not publish it?**



**The *Kentucky Journal of Undergraduate Scholarship* (KJUS) is an online journal that will publish original research and creative works by undergraduate students currently enrolled at post-secondary educational institutions in Kentucky.**

**The topics vary by discipline, and will be categorized into one of several domains, including Life Sciences, Engineering, Social Sciences, Humanities, Creative Writing, Performance Arts, and MORE!**

**Please visit the website at  
<http://encompass.eku.edu/kjus/>**

**For more information and questions, please contact the Executive Editor, Dr. Jonathan Gore ([Jonathan.Gore@eku.edu](mailto:Jonathan.Gore@eku.edu))**

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AGRICULTURE,  
FOOD SCIENCE, AND  
SUSTAINABLE SYSTEMS  
AND LAND GRANT PROGRAM

## Student Competition Awards

In the interest of an earlier end time for those who have a long drive home, we have not scheduled an Awards Ceremony this year. Winners names will be posted at Registration as they are decided, and we encourage all 1st 2nd and 3rd place winners to come by Registration to check the lists and have your photo taken at our KAS Winners Photo Booth! We will be posting your names and photos on our website after the meeting, and certificates will be mailed to winners. Thank you!

We plan to bring the Awards Ceremony back next year at WKU.



## POSTER PRESENTATIONS

Posters can be set up on Friday from 4:00 - 5:00 pm. Please check in at the Poster check in desk on the 3rd floor of the Curris Center. Each presenter will be provided with a poster board and clips, and each poster board will be identified with a number that matches the presenter's poster number. There will be individuals available to help guide you to your place.

The posters should remain up for the duration of the meeting. Students who enter the Undergraduate Research Competition must be at their posters at their scheduled time Friday to be judged.

Underlined authors are presenting.

**Poster Judging: Friday 5:00-8:00 pm**

### AGRICULTURAL SCIENCES

Curris Center

*Chair: Jean Gumirakiza*

*Secretary:*

Poster #	Title, Authors, Affiliations
61.	<b>Effects of excess dietary branched chain amino acids (leucine and isoleucine) on growth and health of Nile tilapi.</b> <u>Cora Teets</u> , Waldemar Rossi, Vikas Kumar - Kentucky State University
62.	<b>A Comparison of the Characteristics of Kentucky and Illinois Soils Under Various Land Cover.</b> <u>Bernedette Chadwick</u> , Michael Mercer, Bailey Webster, Brandon Clark, Iin Handayani, Brian Parr - Murray State University
63.	<b>Dehydration of autumn olive berries for human consumption.</b> <u>Changzheng Wang</u> , Lingyu Huang, Cecil Butler - Kentucky State University
64.	<b>Developing cold-hardy perennial ornamentals for Kentucky.</b> <u>Hideka Kobayashi</u> - Kentucky State University

65. **Distinguishing Differences of Soil Physical Properties in Irrigated and Non- Irrigated Corn-soybean Rotation and Pasture.** Harry Franklin, Duncan Thomas, Connor Raymond, Jacob Flemming, Iin Handayani, Brian Parr - Murray State University
66. **Effects of fertilization on growth performance of lotu plants in containers.** Changzheng Wang - Kentucky State University
67. **Impact of Soil-Set®, Grain-Set®, and Liqui-Plex® Formulations on Hot Pepper Yield.** George Antonious, Kirk Pomper, Eric Turley, Quinn Heist, Thomas Trivette, Lusekelo Nkuwi, Yogendra Upadhyaya, Bjesh Mishra - Kentucky State University
68. **Online Shoppers; Who Attends Farmers' Markets, Who Does Not, and Why?** Jean Dominique, Gumirakiza, Thomas Kingery, Stephen King - Western Kentucky University
69. **Soil Distinguishing Factors in Pasture and Irrigated Soils in Tennessee, Kentucky, and Illinois.** Spencer Fulkerson, Joel Reddick, Landon Williams, Blake Remmert, Iin Handayani, Brian Parr - Murray State University
70. **Soil Properties in Varying Crop and Non-Crop Areas of Calloway County, Kentucky.** Zack Eells, Canaan Wring, Clay Smotherman, Connor Moore - Murray State University
71. **The Impact of Cropping Systems on Soil properties in Fredonia and Princeton Kentucky.** Bailey Webster, Iin Handayani, Brian Parr - Murray State University
72. **Yield of Eggplant Grown in Horse Manure and Vermicompost Amended Soil.** Yogendra Upadhyaya, Thomas Trivette, Lusekelo Nkuwi, Bijesh Mishra, George Antonious - Kentucky State University
73. **Analyzing Quality and Quantity of Binary and Pure Stands of Low Lignin and Standard Alfalfa.** Kelly Hagan -Asbury University, Ray Smith -University of Kentucky

## **BOTANY**

Curriss Center

*Chair: Lawrence Alice      Secretary: Maggie Whitson*

74. **Is there an association between sex ratio and the level of sex expression among plant populations?** Juliana Silveira Costa - Federal University of Juiz de Fora; Justin Cornett, D. Nicholas McLetchie - University of Kentucky
75. **Detection of Cryptic Interspecific Hybridization Between *Morus rubra* and *M. alba* Using Molecular Markers.** Taylor Horton, Dayle Saar - Murray State University
76. **Is wintercreeper's (*Euonymus fortunei*) success as an invader due to avoidance of herbivory?** Nellie Heitzman, Sarah Bray - Transylvania University
77. **Building an interactive tree map for the Bellarmine University campus.** David Robinson, Kaitlyn Yates - Bellarmine University

## **CELLULAR AND MOLECULAR BIOLOGY**

Curriss Center

*Chair: Emily Shifley      Secretary: Gary ZeRuth*

78. **Assessing the role of the gene, *pebbled*, in *D. melanogaster* ASP Invasive Behavior,** Hasan Salim, WKU
79. **Elucidating the Relationship Between *sox4a* and *sox4b* in the Zebrafish Eye.** Hadley Neal - KBRIN; Rebecca Petersen, Wen Wen, Ann Morris - University of Kentucky
80. **Characterizing the role of CP1 in *Drosophila melanogaster* and its effects on basement membrane degradation and signaling.** Dane Flinchum, Ajay Srivastava - Western Kentucky University
81. **Examining Gene Expression during *Xenopus* Embryonic Development.** Maria Stewart, Emily Shifley - Northern Kentucky University
82. **Functional Analysis of Signaling Molecules Involved in Spermiogenesis of *Drosophila melanogaster*.** Lee Kendall - Centre College; Samuel White - Murray State University; Douglas Harrison - University of Kentucky

83. **Identifying genetic modifiers in a *Drosophila* model of Inclusion Body Myopathy.** Amber Follin - Biology Department, Berea College; Kyla Britson, Tom Llyod - Neuroscience and Neurology, Johns Hopkins Medicine
84. **FGF and RA signaling pathways interact during development of the *Xenopus* pharynx.** Sarah Kunkler, Emily Shifley - Northern Kentucky University
85. **The effect of benzo[a]pyrene on motor function in neonatal mice.** Katelyn Dunn, Tamika Chappell, Lisa Massie, Shelby Caudill, Pamela Dickson, Nicholas Brinkman, Rachel Dempsey, Christine Curran - Northern Kentucky University
86. **Role of autophagy-related protein Vps34 in the function of adipose tissues and interactions with the immune system.** Henry Kwan, Lan Wu, Luc Van Kaer, Luke Postoak, Margaret Sabourin - Vanderbilt University Medical Center
87. **Using gene expression to better understand macrophages' role in tissue regeneration.** Kendall Collins - KBRIN at University of Kentucky; Jennifer Simkin, Ashely Seifert - University of Kentucky
88. **Visualizing Programmed Genome Arrangement in Live Sea Lamprey Embryos.** Conner Hounshell - Kentucky Biomedical Research Infrastructure Network; Courtney Waterbury, Jeremiah Smith - University of Kentucky
89. **Sex Specific Gene Control of Cardiac Fibrosis.** Bruce Northington - Eastern Kentucky University/ KBRIN, McNair
90. **Annotation of Spock and Inky Mycobacteriophages.** Brittany Farnsley, Jennifer Doyle, Moria Magre - Spalding University
91. **Direct detection of double-stranded DNA of *Staphylococcus aureus* using engineered zinc finger proteins.** Jiyoung Shim, Barnabas Kim, Moon-Soo Kim - Western Kentucky University
92. **Functional and genetic studies of the tRNA modification protein Trm732 in yeast.** Hannah Sizemore, Daisy DiVita, Julia Ziebro, Michael Guy - Northern Kentucky University
93. **Exploring Small Molecule Drugs Binding To Ribosomal**

- Protein L11.** Swetaben Patel, Michal Hetman, Lukasz Slomnicki - University of Louisville
94. **Identification of Selective DDR1 Kinase Inhibitors Using Structure Activity Relationship.** Issac Domenech, Ambra Pozzi, Corina Borza, Craig Lindsley, Daniel Jeffries - Vanderbilt University Medical Center
95. **NADPH oxidase-derived ROS regulate TLR2 responses in mouse dendritic cells.** Morgan Bahnsen - KBRIN
96. **SOCS 1 Role In Manipulation of Neutrophil Signaling By Oral Pathogen, Filifactor alocis.** Thomas Case, KBRIN
97. **Quantifying Tetracycline resistance genes in swine waste anaerobic digester over a period of 100 days.** Melanie Couch - Western Kentucky University; Getahun Agga, John Loughrin, Rohan Parekh - ARS USDA; Eric Conte - Western Kentucky University
98. **Identification of the enzyme responsible for the acp3U modification in bacteria.** Maggie Thomas, Jamison Burchett, Justen Mamaril, Michael Guy - Northern Kentucky University
99. **Impact of Mutations in the EGO and GSE Complexes on Genomic Instability in Saccharomyces cerevisiae.** Samuel Ammerman, Erin Strome - Northern Kentucky University

## **CHEMISTRY: ANALYTICAL & PHYSICAL**

Curris Center

*Chair: Harry Fannin      Secretary: Bommanna Loganathan*

1. **Analysis of Protein Conformations Using Computer Simulations.** Jonnah McManus - Western Kentucky University Chemistry / Gatton Academy
2. **GC-MS analysis of Volatile Organic Compounds in Metastatic and Non-Metastatic Breast Cancer Cells.** Clara Reasoner - Berea College; Amanda Siegel, Hiroki Yokota, Mangilal Agarwal - Indiana University Purdue University Indianapolis

3. **Anaerobic Degradation of Tetracyclines in Agricultural Manure.** Brandon Couch, John Kasumba - Western Kentucky University; John Loughrin - USDA; Eric Conte - Western Kentucky University
4. **Community Usage of Select Illicit and Prescribed Drugs and their Occurrence in the Clarks River.** Allie Skees, Katelyn Foppe, Bikram Subedi - Department of Chemistry, Murray State University
5. **Towards the creation of turn-on fluorescent Schiff base probes for hydrogen sulfide detection.** Maxwell Conte - Western Kentucky; Ali Abd-Elaal - Department of Petrochemicals, Egypt Petroleum Research Inst.; Aaron Kirtland - The Carol Martin Gatton Academy of Mathematics and Science; Yong-Ill Lee, Department of Chemistry, Changwon National University, S.K.
6. **Polyunsaturated Fatty Acid Profile in Hemp-Fed Chicken Egg.** Cole Hulen - Murray State University; Cheyenne Hooks, Nathan Denney - Department of Agriculture Science, Hutson School of Agriculture; Lauren Clark, Gregory Clark - Kentucky 21st Century Agriculture; Bommanna Loganathan, Brian Parr, Bikram Subedi - Murray State University
7. **From Halogenated Anthracenes to Bendable Displays: Decoding the Structure-Optical Gap Correlation.** Kevin Pierce, Alex Thome, Jill Cao, Sebastian Jezowski - Murray State University
8. **The Analysis of Contact Lenses as Forensic Evidence Using FT-IR and Refractive Index.** Rachel Bracker, Lori Wilson - Eastern Kentucky University
9. **Measurement of J-coupling in Mixed Lead and Sodium Pyrophosphate Glasses with PASS and TEPIETA.** Tomas Flores, Jay Baltisberger, Sara Garner - Berea College; Shay Steele - College of Wooster

10. **Sedimentation Fractionation.** Michael Greiving - Kentucky State University
11. **Salt-Assisted Ultrasonicated De-aggregation and Advanced Electrochemistry of Detonation Nanodiamond.** Brendan Evans, Alex Henson, Sanju Gupta - Western Kentucky University
12. **Comparison of Inorganic Elemental Concentrations in Water Samples and Occurrence of Zebra Mussels in Kentucky Lake, USA.** Nicole States, Henry Pruett, Bikram Subedi - Murray State University; Susan Hendricks, David White - Hancock Biological Station, Bommanna Loganathan - Murray State University
13. **ZrO<sub>2</sub>-β-Cyclodextrin (CD) catalyzed synthesis of 2,4,5-trisubstituted imidazoles and 1,2-disubstituted benzimidazoles u.** K.N. Thimmaiah, Mark Montgomery, Padma Thimmaiah, Ashish Pagare, Larry Sylvester, Ray Cox, Paul Grisham, Piya Adris, Lindsay Massie - Northwest MS Community College
14. **Water Purification using Magnetic Biochar.** Anne Carlisle - Western Kentucky University
15. **Computer Simulations of Conformations of Large Dynamic Proteins.** Harper Sewalls - Western Kentucky University
16. **A DRIFT Plus TG Device Reveling Unknown Chemicals Reaction Mechanisms.** Junjie Xiang - Western Kentucky University
190. **Heavy Metal Accumulation in Aporrectodea complex and Risk Assessment of Bio Magnification.** Demetrius Davis - Kentucky State University/University of Kentucky
192. **New Materials for Optoelectronic Devices: Structure-Optical Gap Trends in Halogenated Aromatic Compounds.** Alex Thome, Jill Cao, Kevin Pierce, Sebastian Jezowski - Murray State University

## CHEMISTRY: ORGANIC/INORGANIC

Curriss Center

*Chair: Kevin Revell*

*Secretary: Kyle Watson*

17. **Application of metal-organic framework materials in dye-sensitized solar cells.** Ryan Boggess, Bangbo Yan - Western Kentucky University
18. **Effect of Iron charge state on P450 BM3 stability.** Catherine Denning, David Heidary, Edith Glazer - University of Kentucky
19. **Fluorescence properties of metal-organic frameworks containing ruthenium and copper ions.** Bangbo Yan, Robert Spears - Western Kentucky University Department of Chemistry
20. **Kinetic analysis of the mechanosyntheses of transition metal complexes and precursors.** Erin O'Donnell, Rachel Allenbaugh - Murray State University
21. **Kinetic Studies of High-valent metal(IV)-oxo porphyrins generated by chemical and photochemical methods.** Haiyan liu - Western Kentucky University
22. **Light Activated Ruthenium Peptide Hybrids.** Lydia Millard - Kentucky State University
23. **N-Heterocyclic Carbene Complexes.** Mario Chavarria, Cheyenne Haynes - Berea College
24. **Optimization of lipid extraction from *Scenedesmus acutus* via in-situ transesterification.** Vincent Kelly - Kentucky State University; Robert Pace - University of Kentucky
25. **Photocatalytic reduction of carbon dioxide by metal-organic framework materials.** Hannah Brooks, Bangbo Yan - Western Kentucky University
26. **Promotional Effect of Platinum on Nickel Catalysts in the Conversion of Lipids to Hydrocarbons in Diesel Range.** Kelsey Huff - Kentucky State University; Ryan Loe, Tonya Morgan, Eduardo Santillan- Jimenez, Mark Crocker - University of Kentucky's Center for Applied Energy Research



27. **Reduction of Mannich Bases to Form 1,3-Amino Alcohols Using a Knölker-type Catalyst.** Alexandra Redden, Rachel Whittaker, Kane Ferguson - Murray State University
28. **Selective C–O bond reductions in carbohydrate derivatives using boron based reagents.** Luis Gonzalez Anguiar - Berea College
29. **Solid-Phase Synthesis of Heteroatom-Activated Antibiotics.** Morgan Uebelacker, Jacob Nanney, Kyle Watson - Kentucky Wesleyan College
30. **Storage of Solar Energy in Strained Bis-Anthracene Cycloadducts and Release as Heat by Mechanical Grinding.** Erin Calvert, Kasey Clear, Sebastian Jezowski - Murray State University
31. **Synthesis and catalytic studies of metalloporphyrin complexes as biomimetic models for cytochrome P450 enzymes.** Benjamin Kash - Gatton Academy, Western Kentucky University; Haiyan Liu, Rui Zhang - Western Kentucky University
32. **Synthesis and Properties of a Ruthenium Polypyridyl Complex.** Hannah Cope, Bangbo Yan - Western Kentucky University
33. **Synthesis of Cleavable Acetal Antibody Drug Conjugate.** Luis Salazar Guzman - Berea College
34. **Synthesis of Platinum-Malonate-Luteinizing Hormone Releasing Hormone (Pt-Mal-LHRH), an Anti-Cancer Agent.** Charles Greif - Eastern Kentucky University
35. **Synthesis of Poly(4-hydroxystyrene) by Living Anionic Polymerization for Block Copolymer Lithography.** Beau Schweitzer - Berea College
36. **Synthesizing Cleavable Acetal Antibody Drug Conjugates.** Michael James, Sarah Tabor, Elizabeth Thomas - Berea College

## COMPUTER AND INFORMATIONAL SCIENCES

Curriss Center

*Chair: Jerzy Jaromczyk*

*Secretary: Muzaffar Ali*

37. **Incorporating WeBWork in a Mathematics Classroom.** Haley Replogle, Kyle Besing - Kentucky Wesleyan College
38. **Open Science Grid (OSG) Tier2 Grid Site at Bellarmine University for the LSST (Large Synoptic Survey Telescope) Project.** Russell Sexton, Stephen Denny, Akhtar Mahmood, M. Saleem - Bellarmine University

## ECOLOGY AND ENVIRONMENTAL SCIENCES

Curriss Center

*Chair: Maheteme Gebremedhin*

*Secretary: Roberta Challener*

100. **American Chestnut restoration in Daniel Boone National Forest: a GIS approach.** Jacob Pease - Murray State University
101. **Comparative Analysis of Soil Elemental Composition Using Portable X-Ray Fluorescence In Multiple Land Use Practices.** Ellyn Anthony, Oguz Sariyildiz, Mamata Bashyal, Shawn Lucas - Kentucky State University; Tony Silvernail - Runchero Farms; John Sedlacek - Kentucky State University
102. **Ant communities of temperate tree canopies along an urban-rural gradient.** Heather Short, Daniella Prince, Benjamin Adams, Keegan Thompson, Chloe Lash, Stephen Yanoviak - University of Louisville
103. **Is it enough? Passive Restoration in a Western Colorado Stream.** Melody Feden, Howard Whiteman - Murray State
104. **The Mobility of Nickel in Soil and the Efficacy of Sphagnum Peat Moss to Immobilize Nickel with Contaminated Soils.** Vanetta Graves - Kentucky State University
105. **Leaf Toughness in Tropical Rainforest Plants Depends on Leaf Age in Dicots but Not Monocots.** Shelby Watkins, Stephen Yanoviak, Christopher Frost - University of Louisville

106. **Examining the Relationship Between Temperature and Vegetation Phenology: Is Soil a Better Predictor than Air?** Kevin “Austin” Johnessee, Monika Staszczak - Murray State University
107. **Effect of Slope and Packing Ratio on the Behavior of Matchsticks Burnings.** Roma Karna, Sunil Karna, Priya Karna, Sunil Karna - Union College
108. **Site selection by the Jefferson’s and spotted salamanders based on substrate pH.** Tosha Shokes, Jarrett Johnson - Western Kentucky University
109. **Assessing the effects of urban air pollution on lichens.** Austin Adam, Roberta Challener - Bellarmine University
110. **The Effects of Stream Degradation on Food Web Stability.** Hannah Moore, Howard Whiteman - Murray State University
111. **Water Levels and Temperatures Define Narrow Window of Larval Fish Phenology in Kentucky Lake.** Spencer Phillips, Nathan Tillotson, Ben Tumolo, Michael Flinn - Murray State University
112. **Honey Bee Gene Expression Response to Pesticides Under Differential Nutritional Status.** Alishea Brown, Farida Olden - Kentucky State University
113. **Patterns of Herbivory Among Leaves of Tropical Forest Canopy Trees.** Maria Shields, Christopher Frost, Stephen Yanoviak - University of Louisville
114. **Driver bias in intentional wildlife-vehicle collisions.** Mary Wilkinson, Terry Derting - Murray State University
115. **Using Hardiness Zones to Determine Phenological Variation.** Whitney Buechler, Bassil El Masri, Paul Gagnon - Murray State University

116. **Assessing Stormwater Impacts and Hydrogeological Influences on Water Quality in an Urban Karst Lake.** Rachel Kaiser, James Shelley - Western Kentucky University
117. **Is aboveground pathogen load influenced by belowground pathogen presence, plant community diversity, or precipitation.** Aspen Workman - University of Louisville; Claudia Stein, Scott Mangan - Washington University in St. Louis
118. **Insect Pollinator Diversity in Gardens Across an Urban-to-Suburban Gradient.** Jacob Lawson, Margaret Carreiro, Lindsay Nason, Perri Eason, Amy Cherry - University of Louisville
119. **Sensing and educating the NEXUS to sustain ecosystems (SENSE): A Kentucky-West Virginia partnership.** David White, Susan Hendricks - Murray State University; Mindy Armstead - Marshall University; Bill Ford, Jimmy Fox - University of Kentucky
120. **Improving Detection and of a Threatened Anuran Species (*Lithobates areolatus*) in Western Kentucky.** Michaela Lambert - University of Kentucky
121. **Exploring the impact of body size variation on trophic cascades using mole salamanders (*Ambystoma talpoideum*).** Robin Baker - Murray State University; Cy Mott - Eastern Kentucky University; Katelyn May, Howard Whiteman - Murray State University
122. **Ability of Bald Cypress (*Taxodium distichum*) to enhance aquatic structure in backwater embayments of reservoirs.** Christy Soldo, Michael Flinn - Murray State University
123. **Dose of a plant-derived volatile cue affects *Arabidopsis thaliana* defense phenotypes.** Sarah Bissmeyer, Chris Frost, Grace Freundlich - University of Louisville
124. **Season fluctuations in *Ambystoma barbouri* eDNA in central Kentucky streams.** Andrew Nesselroade, Ronald

Sams, Cierla McGuire - Asbury University; Sumathi Sankaran-Walters, Mike McGrann - Walters William Jessup University; Malinda Stull, Ben Brammell - Asbury University

125. **Caterpillar Predation Rates Across an Urban-Suburban Gradient.** Amy Cherry, Jacob Lawson, Lindsay Nason, Margaret Carreiro, Perri Eason - University of Louisville
126. **Proliferation of Zebra Mussels (*Dreissena polymorpha*) in Kentucky Lake during 2017.** Michael Flinn, Melody Feden, Ben Ferguson, Bradley Hartman, Kayleen Parker, Spencer Phillips, Ivan Roe, Christy Soldo, Susan Hendricks - Murray State University - Hancock Bio Station
127. **Detection of *Percopsis omiscomaycus* (trout-perch) using eDNA in eastern Kentucky streams.** Andrew Nesselroade, Harold Brabon - Asbury University; David Eisenhour, Brooke Washburn, Lynn Eisenhour - Morehead State University; Ben Brammell - Asbury University
128. **Ant tarsal adhesion on oak leaves differing in trichome density.** Keegan Thompson - University of Louisville; Alyssa Stark - Villanova University; Steve Yanoviak - University of Louisville
129. **Body Size of Leaf-Carrying and Hitchhiking Leafcutter Ants in a Tropical Forest.** Virginia Nunamaker, Chris Nunamaker, Steve Yanoviak - University of Louisville
130. **Assessing the diet of *Perimyotis subflavus* and *Nycticeius humeralis* bats before and after the occurrence of WNS.** Summer Wheeler, Amie Towery - Murray State University
131. **Health of the Lee Branch on the Midway University Campus: Biological stream assessments and stream habitat assessments.** John Delfino - Midway University; Guipsy Lopez
132. **Relationship between fish biomass and eDNA in central Kentucky streams.** Ramon Guivas, Kyle Laufenburger, Ben Brammell - Asbury University

133. **Effects of Roundup on Feeding Behavior of Larval Blue Dashers, *Pachydiplax longipennis*.** Kayleen Parker, Claire Fuller - Murray State University
134. **Assessing Mussel Condition and Potential Dam Impact on the Green River, KY,** Lauren Mayton - Campbellsville University
135. **Herbivory rates of Amazonian melastomes are unaffected by the presence of domatia-inhabiting ants.** Jeffrey Fox, Chris Frost, Steve Yanoviak - University of Louisville
136. **Honeysuckle leaf blight causes a growth decline in Amur honeysuckle seedlings.** Onyinye Uwolloh, Sarah Farrar, Kimberly Wolfe, Steven Castellano, Richard Boyce - Northern Kentucky University

## **ENGINEERING**

### **Curriss Center**

*Chair: Aaron Daley*

*Secretary: Shen Liu*

39. **Green Roofs: Synergistic Benefits to Energy and Environmental Building Design.** *Emery Ginger* - Murray State University
40. **Automated Control System For Photo-bioreactor.** Madankrishna Acharya - Kentucky State University
41. **Biomass Stove Design Project: Automated Fuel Feeder System.** Chance Davice, Mark Mahoney, Constantine Botimer, Chris True, Jedidiah Radosevich - Berea College
42. **Integrated Computational Design of Tunable 3D CNT/ Graphene Hybrid Nanomaterials.** Tyler Stoffel, Jordan Garcia, Charles Lu - University of Kentucky; Johnson Joseph - Fiat Chrysler Automobiles
43. **Quantification of Cast Aluminum Pores using MATLAB (by Rayens, N., Cai, P., and Zhai, T.)** Nathan Rayens, Tongguang Zhai, Pei Cai - University of Kentucky

## **GEOGRAPHY**

### **Curriss Center**

*Chair: Buddhi Gyawali      Secretary: Christopher Day*

44. **Comparing Vegetation Index and Classification methods for detecting agriculture conservation practice using Landsat image.** Kenneth Hancock - Murray State University
45. **Unmarked Burial Identification at the Frankfort, KY Cemetery using Ground Penetrating Radar and LIDAR data.** Jarod Jones, Jordan Wison, jeremy sandifer, Ken Bates - Kentucky State University
46. **Land Cover Change Assessment in Six Major Watersheds of Central, and Eastern Kentucky using National Land Cover Database.** Aman Bhatta, Saaruj Khadka Bijesh Mishra, Buddhi Gyawali, Prabisha Shrestha, Jeremy Sandifer, Tilak Shrestha - Kentucky State University

## **GEOLOGY**

### **Curriss Center**

*Chair: Ann Harris      Secretary: David Dockstader*

47. **Using Sequential LiDAR to Monitor & Catalog Landslides in Kenton and Campbell Counties in Northern Kentucky.** Roger Olson, Benjamin Roenker, Hawkins Warner, Zachary Ivey, Tim Faller, Sarah Johnson - Northern Kentucky University
48. **Variability of Soil Organic Carbon Storage in Alluvial Landforms: A Case Study from Western Kentucky.** Benedict Ferguson, Gary Stinchcomb - Murray State University: Department of Geosciences
49. **Late Holocene Paleoflood Depositional Sequences: Middle Tennessee River Valley, USA.** Christopher Stewart, Gary Stinchcomb - Murray State University; Steve Forman - Baylor University; Lisa Davis - University of Alabama

50. **Site Formation of the Middle Pleistocene Farre Archaeological Site, Northern Kenya.** Mallory Gerzan, Gary Stinchcomb - Murray State University
51. **Investigation of Omnivory in the Drilling Gastropod, *Urosalpinx Cinerea*, Using Stable Isotope Analysis.** Molly Karnes - Murray State University

## HEALTH SCIENCES

Curriss Center

*Chair: Bruce Branan*

*Secretary: Avinash Tope*

137. **An Automatic Segmentation Method for the Thigh Muscles and Adipose Tissue of Spinal Cord Injured Patients.** Carter Waugh, Kentucky Biomedical Research Infrastructure Network
138. **Demographic/occupational/tumor characteristics & extent of metastasis melanoma patients diagnosed in Florida, 1996-2010.** Frederick Bebe - Kentucky State University; Shasha Hu - University of Miami, Miller College of Medicine; Tony Brown, Oriens Tulp - SAT College of Medicine & graduate School
139. **Effect of select phytochemicals on salivary and urinary pH.** Ralphiel Payne, Sydney Leisure - Kentucky Wesleyan College
140. **Effects of salt on the textural characteristics of fish meatballs prepared from deboned Asian carp meat.** Lingyu Huang, Cecil Butler, Changzheng Wang - Kentucky State University
141. **Examining the Expression and Function of Septin Proteins in Human Pancreatic Cancer Cells.** Danielle Upton - UPIKE, Maiyon Park - KYCOM-UIPIKE, Valerie Dixon, Zachariah Slattery - KYCOM
142. **Health Impact of a Shared Use Path in Rural Appalachia: A Pilot Study.** Louisa Summers, Scott Heggen, Christopher Harris, Daryl Sullivan, Peter Hackbert - Berea College



143. **Immunogenicity of Novel Vaccines for Hepatitis C Virus.** Donniesha Mason, Ashley Wentworth, Reese Triana - Northern Kentucky University, Joseph Mester - Employer
144. **Measurement of Influenza Severity in Tennessee Hospitalized Patients, 2016-2017.** Allison Harper - Berea College; Tiffanie Markus, Gail Hughett, Danielle Ndi, Karen Leib, H. Keipp Talbot - Vanderbilt University
145. **Secondary Traumatic Stress and Resilience in Emergency Medical Service Providers: A Look at the Adaptive and Maladaptive.** Manoj Pathak - Murray State University; Cindy Austin, Simon Thompson - Department of Trauma and Burn, Mercy Hospital
146. **The Relationship Between Maternal Physical Activity and Infant Motor Development.** Nikitha Rajendran - Gatton Academy, Western Kentucky University; Rachel Tinius - Western Kentucky University
147. **Urinary 8-OHdG as a Non-Invasive Biomarker of Oxidative Stress in Metabolic Syndrome (MetS).** Bisola Asaolu, Avinash Tope - Kentucky State University
148. **Using engineered zinc finger proteins to detect pathogen-specific DNA.** Caleb Sedlak - Department of Chemistry WKU
149. **Zinc, Dietary Fat, and Sex have Interacting Influences on BTBR Mice in the Open Field Test.** Kandis Arlinghaus - Bellarmine University; Nicholas Mellen - University of Louisville

## MICROBIOLOGY

Curriss Center

*Chair: Lingyu Huang*

*Secretary: Joseph Mester*

150. **Inactivation of Fungal Spores with Heat and UVC.** Colin Hartman, Sarah Goodrich, Mitchel Lange, Zadah Coy, Joseph Mester - Northern Kentucky University

151. **Mycobacteriophages: Inky and Spock.** Moria Magre, Brittany Farnsley, Jennifer Doyle - Spalding University
152. **Antifungal Endophytes as a Source of Novel Bioactive Compounds.** Katie Sawvell, John Carmen - Northern Kentucky University
153. **Production of hydrogen peroxide as a virulence factor by *Mycoplasma mycoides subspecies capri*.** Zackery Newton, Rachel Pritchard - Kentucky Wesleyan College
154. **The Prevalence of Bacteria Resistant to Vancomycin and Colistin in Waters Around Louisville.** Rachel Mahbubani, Amy Priest, Annie Koenig, Easton Ford, Doug Krauth, Deborah Yoder-Himes, Paul Himes - University of Louisville
155. **Isolation and Characterization of the Mycobacteriophage Acquire49.** Charles Mosley, Tyler Burton John Starnes - Somerset Community College
156. **Extraction and Elucidation of Active Compounds in Antimicrobial Producing Isolates.** Zaria Elery, John Carmen - Northern Kentucky University
157. **Survey of Vancomycin- and Colistin-Resistant Bacteria in Environmental Water Samples Across Louisville.** Easton Ford, Morgan Robinson, Amy Priest, Rachel Mahbubani, Doug Krauth, paul himes, Deborah Yoder-Himes - University of Louisville
158. **Non-pathogenic *Neisseria sicca* ATCC 29256 undergoes natural transformation.** Mark Sirianno, Paul Duffin - Transylvania University
159. **The Toxic Effects of Chemically Synthesized and Biologically Fabricated Gold Nanoparticles on *Caenorhabditis elegans* Fit.** Grayson Fuller - Western Kentucky University

160. **Targeting Proteolytic Activity using protease inhibitors as natural therapeutics for human metapneumovirus (HMPV).** Amber Earlywine - Berea College, Department of Chemistry

## PHYSICS AND ASTRONOMY

Curriss Center

*Chair: Troy Messina*

*Secretary: Marilyn Akins*

52. **Comparison of Period Finding Techniques to Identify RR Lyrae Stars.** Connor Edwards, Logan Hicks, Tyler Labree, Matthew Buelsing, Nathan De Lee - Northern Kentucky University
53. **Electromagnetic Wave Motion Around a Black Hole.** Amanda Manning, Sharmanthie Fernando - Northern Kentucky University
54. **Analyzing Color Relations for RR Lyrae in KELT.** Logan Hicks, Connor Edwards, Tyler Labree, Matthew Buelsing, Nathan De Lee - Northern Kentucky University
55. **Gold and Silver Nanoparticles Decorated Graphene as ‘smart’ Surface Enhanced Raman Scattering (SERS) Platforms.** Alexander Banaszak, Tyler Smith, Sanju Gupta - Western Kentucky University
56. **Large-Area Graphene Membranes and Mesoporous Deionization Electrodes for Water Desalination.** Alex Henson, Brendan Evans, Sanju Gupta - WKU Department of Physics and Astronomy
57. **Nanoparticles-grafted functionalized graphene coated with nanostructured polyaniline layered nanocomposites as high-perf.** Romney Meek, Sanju Gupta - Western Kentucky University
58. **Surface Functionality Of Graphene-family Nanomaterials On Electronic And Phononic Properties For Applied Electrochemistr.** Brendan Evans, Alex Henson, Sanju Gupta - Western Kentucky University

59. **Systematic Study of the Effects of Incorporation of Carbon Nanotubes into the GexSe1-x Glass System.** John Adamick, John Rademacher, Chari Ramkumar, Wayne Bresser - Northern Kentucky University
60. **The Study of Light Paths Around Black Holes.** Abigail Campbell - Northern Kentucky University

## PHYSIOLOGY AND BIOCHEMISTRY

Curriss Center

*Chair: Michael Smith*

*Secretary: Julia Carter*

161. **An improved, 'green' tetramethylbenzidine-based assay for the quantification of hemoglobin.** Johnathon Hurt, Joan Hembree - University of the Cumberland
162. **Developing TALE proteins as a sensor for detecting pathogens.** Kathrine Gaiko - Western Kentucky University
163. **Examining the role of muscarinic acetylcholine receptors in regulation of larval *Drosophila melanogaster* feeding and loc.** Meagan Medley - KBRIN
164. **Identification of a *Drosophila melanogaster* model to explore O-GlcNAc signaling.** Emily Altman - Georgetown College; JoBeth Bingham, Dr. Lewis Watson - University of Pikeville
165. **Inhibition of PDE4 fails to reverse behavioural deficits induced by muscarinic receptor blockage.** Samuel Case, Ilsun White - Morehead State University
166. **Investigating Potential Mechanisms of Clove Oil (Eugenol) in Model Systems.** Elizabeth Grau, Alec Bradley, Danielle Cantrell, Samantha Eversole, Carolyn Grachen, Kaylee Hall, Claire Kinmon, Paula Ortiz Guerrero, Bhavik Patel, Robin Cooper - University of Kentucky

167. **Investigating the Synergistic Effects of Two Curcuminoids and Cisplatin on Cancer Cell Migration and ROS Release.** Blaine Patty, Matthew Millay, Jerry Monroe, Michael Smith - Western Kentucky University
168. **MK-801, a NMDA antagonist, reverses scopolamine-induced behavioral deficits.** Elizabeth Collins, Sami Case, Brianna Ward, Ilsun White - Morehead State University
169. **Pharmacological identification of cholinergic receptor subtypes in *Drosophila*.** Eashwar Somasundaram, Aya Omar - University of Kentucky; , Cole Malloy - NIH; Robin Cooper - University of Kentucky
170. **The effects of a ketogenic diet on behavior and synaptic transmission in a *Drosophila* model.** Alex Stanback, Hunter Maxwell, Clare Cole, Katherine Johnson, Jenni Ho, La Shay Byrd, Samantha Danyi, Sushovan Dixit, Madan Subheeswar, Maddie Stanback - University of Kentucky

## PSYCHOLOGY

Curriss Center

*Chair: Richard Osbaldiston      Secretary: KatieAnn Skogsberg*

177. **Can nicotine improve scopolamine-induced behavioral deficit?** Brianna Ward, Elizabeth Collins, Ilsun White - Morehead State University
178. **Betta fish spontaneously use the combination of numerosity and surface area during discrimination learning.** Alicia Bedolla, Evelyne Rivera Perez, Joseph Barger, Jasmine Roman, Sarah Jones - Berea College
179. **What influences recognition of emotion among college students.** Shannon Mapes, Suzanne Savard, Ilsun White, Kinetta Crisp - Morehead State University

180. **Dual-task methodology: The use of video games as a surrogate for traditional laboratory tasks.** Mark Morris, Vanessa Jones, Stephani Prince - Morehead State University; Nicholas Kelling - University of Houston Clear Lake; Gregory Corso - Morehead State University
181. **Implicit Gender Bias, Commercials, and Cooperation.** Rick Holland - Berea College
182. **Let's Face It: The Effects of Disclosure Type and Modality on Student Comfort.** Caitlin Taulbee - Berea College
183. **Maternal reflective functioning and dyadic synchrony.** Madison Raymer, Megan Conn - Morehead State University
184. **Maternal trauma and parenting sensitivity: Implications for attachment-based interventions.** Ashley Hamm, Madison Raymer, Dr. Shari Kidwell - Morehead State University Psychology Department
185. **The Effect of Noise, Intention, and Time of Day on Memory.** Alicia Bedolla - Berea College
186. **Affect Perseverance or Affect Momentum?** Stephanie Temple - Berea College

## SCIENCE EDUCATION

Curriss Center

*Chair: Shira Rabin*

*Secretary: Karen Hlinka*

187. **The POGIL Approach to Teaching.** Lucas Collett - Berea College
188. **Using the POGIL Approach in Non-Stem Disciplines.** Miguel Valdes, Megan Hoffman, Lucas Collet - Berea College

189. **Preparing K-8 teachers to utilize learning progressions to teach properties of materials.** Martin Brock - Eastern Kentucky University

## **ZOOLOGY**

Curriss Center

*Chair: Roy Scudder-Davis*

*Secretary: Oliver Beckers*

171. **Dietary effects on behaviors for *Drosophila*: behaviors, survival and physiological responses.** Maddie Stanback, Alexandra Stanback, Tristan Donovan, Priscilla Boachie, Brendon Stockwell, Carly Ballinger-Boone, Emma Higgins, Meaghan Labarre, Alexa Larson, Micaiah McNabb - University of Kentucky
172. **Characterization of mating behaviors and risk of cannibalism in *Tigrosa georgicola* wolf spiders.** Talon Garman, Laura Sullivan-Beckers - Murray State University
173. **Bat Call Monitoring Study and Discrimination Between Species in Taylor County, Kentucky.** Katherine Cappel - Campbellsville University
174. **Comparing inner ear morphologies of globicephaline (Odontoceti: Delphinidae: Globicephalinae) dolphins.** Abigail Glass - Murray State University, Rachel Racicot - Vanderbilt University; Michelle Casey - Murray State University; Simon Darroch - Vanderbilt University
175. **Heritable Behavioral Tendencies of the African Lion.** Natalie Mercer, Shannon Finerty - Kentucky Wesleyan College
191. **The Effect of Chemical Sympathectomy on Mouse Sleep Using Piezoelectric Technology.** Benjamin Conkright - Western Kentucky University





## **ORAL PRESENTATIONS**

### **AGRICULTURAL SCIENCES**

Jean Gumirakiza, Chair  
Western Kentucky University

SATURDAY, NOVEMBER 4, 2017  
THE STABLES, CURRIS CENTER 1ST FLOOR

- 8:15 am **Is Pawpaw Self-Compatible? Determining Compatibility and Its Impact on Fruit and Seed Set in North American Pawpaw.** Srijana Thapa Magar, Kirk Pomper, Jeremiah Lowe, Sheri Crabtree - Kentucky State University
- 8:30 am **Enzymes as Indicators of Soil Microbial Activity at three Locations in Kentucky.** GEORGE ANTONIOUS - Kentucky State University
- 8:45 am **Assessing the nutritional value of novel soybean products in the diet of Atlantic salmon (*Salmo salar* L.).** James Schwartz, Vikas Kumar, Waldemar Rossi - Kentucky State University; Katerina Kousoulaki - Nofima
- 9:00 am **Responses of juvenile largemouth bass (*Micropterus salmoides*) to dietary EPA and DHA rich oils.** Amit Yadav, Waldemar Rossi, Hab Andemichael, Vikas Kumar - Kentucky State University
- 9:15 am **Applicability of waste-reared *Hermetia illucens* as an ingredient in the diet of Nile Tilapia, *Oreochromis niloticus*.** Samuel Kessler - Carol Martin Gatton Academy of Mathematics and Science, WKU; Vikas Kumar, Waldemar Rossi - Kentucky State University, Aquaculture Research Center
- 9:30 am **Comparing the Effects of Long-term No Till and Conventional Tillage on Soil Properties in Central Kentucky.** Emily Cook, Lin Handayani, Jessica Pafford, Steve Still - Murray State University; John Grove, Mark Coyne, Ann Freytag - University of Kentucky
- 9:45 am **Spotted wing *Drosophila*, *Drosophila suzukii*, larvae in blackberries bordered by native perennial plants or pasture.** Sathya Govindasamy, John Sedlacek, Karen Friley, E. Kyle Slusher, Mamata Bashyal, Megan McCoun - Kentucky State University
- 10:00 am **Comparing the abundance of beneficial insects in blackberry plots bordered by native perennial plants and pasture and sprayed with biologically based insecticides.** Mamata Bashyal, John Sedlacek, Karen Friley, E. Kyle Slusher, Sathya Govindasamy, Megan McCoun - Kentucky State University
- 10:15 am Morning Break
- 10:30 am **Optimizing Hemp Production through Cultivar Selection and Soil Management Practices.** Rose Johnson - Kentucky State University

- 10:45 am **An Assessment of Nutritive Value and Optimization of Soybean Meal-Based Diets for Largemouth Bass.** Gagan Kolimadu, Jarod Jones, Kristy Allen, Waldemar Rossi - Kentucky State University; Michael Habte-Tision , Vikas Kumar - Kentucky State University
- 11:00 am **Antibiotic Susceptibilities of Bacteria Isolated from the Same Fish in Cases Examined at the Kentucky State University Fish Disease Diagnostic Laboratory.** Ashmita Poudel, Kathryn Mitchell, Robert Durborow - Kentucky State University
- 11:15 am **Investigating the Impact of Low-Cost Organic Fertilizers on Tomato Yield.** Lusekelo Nkuwi, George Antonious, Eric Turley - Kentucky State University
- 11:30 am **Evaluation of Density in a Live Holding System for Food Size Channel Catfish, *Ictalurus punctatus*.** Sujan Bhattacharai, Ken Semmens, Vikas Kumar - Kentucky State University
- 12:00 pm Lunch break
- 1:00 pm **Are Online Shoppers Aware and/or Interested In Learning About Direct-To-Consumer Market Outlets?** Jean Dominique Gumirakiza, Stephen King, Thomas Kingery - Western Kentucky
- 1:15 pm **As online shopping becomes popular, will consumers still be interested in direct-to-consumer offline market outlets?** Jean Dominique Gumirakiza, Thomas Kingery, Stephen King - Western Kentucky
- 1:30 pm **Analyzing the Effects the use of Best Practices for Farm Management has on Farm Financial Position and Profitability.** Audrey Barnett, Dominique Gumirakiza - Western Kentucky University
- 1:45 pm **Evaluation of Two Salt Applications for Holding Large-Moth Bass *Micropterus Salmoides* for Marketing as a Food Fish.** Thomas Mason, Ken Semmens - Kentucky State University
- 2:00 pm **Evaluation of Microbial Quality of Agricultural Water from Small Farms in Kentucky.** Shreya Patel, Avinash Tope - Kentucky State University
- 2:15 pm Agriculture Section meeting

## ANTHROPOLOGY AND SOCIOLOGY

Benjamin Freed, Chair  
Eastern Kentucky University

Amanuel Beyin, Secretary  
University of Louisville

SATURDAY, NOVEMBER 4, 2017  
OHIO ROOM, CURRIS CENTER

- 1:00 pm **LGBTQ+ Suicide: A review of the literature on social services for the queer community.** Mason Gibson - Western Kentucky University
- 1:15 pm **The Effects of Parental Guidance and Internet Use on Teenagers Experiencing Cyberbullying.** Hannah Ridner - Western Kentucky University

- 1:30 pm **Challenges and coping strategies of Chinese exchange students attending a university in Eastern Kentucky: A case study.** Wilson Gonzalez Espada - Morehead State University; Shanshan Li, Jun Peng - Xingjian College of Science and Liberal Arts, Guangxi Univ.
- 1:45 pm **Malaria in the Prehistoric Caribbean: The Hunt for Hemozoins.** Mallory Cox - University of Louisville
- 2:00 pm **Shifting Agriculture's Effects on Lemurs in a Malagasy Gallery Forest.** Benjamin Freed, Nathanael Bartosch - Eastern Kentucky University
- 2:15 pm Anthropology/Sociology Section meeting

## BOTANY

Lawrence Alice, Chair  
Western Kentucky University

Maggie Whitson, Secretary  
Northern Kentucky University

SATURDAY, NOVEMBER 4, 2017

MISSISSIPPI ROOM, CURRIS CENTER

- 1:00 pm **Far-Red light can induce sex structure development in the liverwort *Marchantia inflexa* Nees et Mont.** Nicholas McLetchie, Maddison Hatton - University of Kentucky
- 2:30 pm Botany Section meeting

## CELLULAR AND MOLECULAR BIOLOGY

Emily Shifley, Chair  
Northern Kentucky University

Gary ZeRuth, Secretary  
Murray State University

SATURDAY, NOVEMBER 4, 2017

BARKLEY LECTURE ROOM, CURRIS CENTER

- 8:00 am **Characterization of Reagents Developed Against Two Basement Membrane Degradors in *Drosophila melanogaster*.** Afolasayo Aromiwura, Ajay Srivastava - Western Kentucky University
- 8:15 am **Evaluation of endocrine pancreas development and maturation in *glis3* mutant zebrafish (*Danio rerio*).** Dylan Hammrich, Gary ZeRuth - Murray State University
- 8:30 am **Using CRISPR/Cas9 to generate transgenic zebrafish to determine the expression pattern of *glis3* during development.** Tyler Hoard, Gary ZeRuth - Murray State University
- 8:45 am **Using RNA interference to identify the *acp3U* tRNA modification enzyme in higher eukaryotes.** Jamison Burchett, Justen Mamaril, Maggie Thomas, Regan Bales, Michael Guy - Northern Kentucky University

- 9:00 am **Pancreatic beta cell dysfunction mediated by down regulation of Glis3.** Erin Clayton, Gary ZeRuth - Murray State University
- 9:15 am **Hepatitis C virus entry inhibitor Aryloxazole modulates Autophagy.** Jazmin Escamilla - Berea College; Zongyi Hu, Jake Liang - Liver Disease Branch, NIDDK-National Institute of Health
- 9:30 am **Exposure Effects of TiO<sub>2</sub> Nanoparticles on the Growth and Physiology of Medicago truncatula.** Ahmed Fadil - Western Kentucky University
- 9:45 am **PAM-1 aminopeptidase prevents neurodegeneration in Caenorhabditis elegans.** Brittani Hawkins, Chris Trzepacz - Murray State University
- 10:00 am Morning Break
- 10:15 am **Collagen IV homology in Nematostella vectensis and Homo sapiens and its implications of regeneration.** Monica Moran, Billy Hudson, Vadim Pedchenko - Vanderbilt University Division of Nephrology
- 10:30 am **Effect of acute sleep fragmentation upon morphology and density of astrocytes in hippocampal and hypothalamic tissue.** Keelee Pullum-Gatton Academy, Western Kentucky University, Noah Ashley - Western Kentucky University
- 10:45 am **An Examination of Epigenetic Factors and Methylation Patterns in Promoter Regions of AT1 and ACE.** Dimond Shelton, Nancy Rice, Conner Hounshell - Western Kentucky University
- 11:00 am **Identifying Autophagy-induced phosphorylation sites on the Hsp70 molecular chaperone.** Alexandria Szalanczy - Centre College; Nitika Nitika, Andrew Truman - University of North Carolina at Charlotte
- 11:15 am **Gene expression differences following early life exposure to polychlorinated biphenyls in three genotypes of mice.** Yislain Villalona, Kelsey Klinefelter, Breann Colter, Alexandra Dailey, Christine Curran - Northern Kentucky University
- 11:30 am Cellular & Molecular Biology Section meeting

## CHEMISTRY: ANALYTICAL / PHYSICAL

Harry Fannin, Chair  
Murray State University

Bommanna Loganathan, Secretary  
Murray State University

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 320

- 8:15 am **Oil Dries a New Absorbent Material; for Collecting Ignitable Liquids | in Arson Scenes.** Jessica Dove - Eastern Kentucky University
- 8:30 am **Kinetic Modeling of Relevant Atmospheric Sulfur and Nitrogen Containing Compounds to Understand Particle Formation.** Jesus Berlanga, Matthew Nee - Western Kentucky University; Philip J. Silva - USDA - ARS

- 8:45 am **Monitoring Photocatalytic Reactions Using Surface Enhanced Raman Spectroscopy.** Ryan Lamb, Matthew Nee - Western Kentucky University
- 9:00 am **The removal of organic pollutants through buoyant photocatalyst.** Kayla Steward, Matthew Nee - Western Kentucky University
- 9:15 am **Upconverting Luminescent Nanomaterials Produced Through Liquid-Phase Laser Ablation.** Rosemary Calabro, Dong-Sheng Yang, Doo Young Kim - University of Kentucky
- 9:30 am **Oxidative stability of fish oil-in-water emulsions stabilized by protein-polysaccharide complexes: Effect of salt and pH.** Mara Krempe, Hayley Moss, Hanna (John) Khouryieh - Western Kentucky University
- 9:45 am **Temperature and electric field dependence of asymmetric stretching of nitrate ion.** Konnor Jones, Matthew Nee - Western Kentucky University
- 10:00 am Chemistry: Analytical/Physical Section meeting

## CHEMISTRY: ORGANIC / INORGANIC

Kevin Revell, Chair  
Murray State University

Kyle Watson, Secretary  
Kentucky Wesleyan College

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 135

- 1:00 pm **A general fabrication approach on spinel  $MCo_2O_4$  (M= Co, Mn, Fe, Mg and Zn) submicron prisms as advanced positive materia.** Hongyan Gao, Yan Cao - Chemistry Department, Western Kentucky University
- 1:15 pm **Chemical and photo generation of high-valent manganese-oxo porphyrins.** Mike Winchester - Western Kentucky University
- 1:30 pm **Multiple Oxidation Pathways for Photo-generated Manganese(V)-Oxo Corroles.** Ngo Fung Lee - Western Kentucky University
- 1:45 pm **Recent Progress in the Investigation of the Bonding and Electronic Structure in Metal Chalcogenide Complexes.** Jessie Brown, Ameila Dickey, Elias Hanna, Christopher Samaan, Hannah Williams, Christine Phipps, Ashley Montgomery - Transylvania University
- 2:00 pm **The Synthesis of Heteroatom-activated Antibiotics:  $\beta$ -lactams.** Jacob Nanney, Kyle Watson - Kentucky Wesleyan College
- 2:15 pm **Visible Light Generation of High-Valent Iron-Oxo Intermediates.** Malone Jonathan, dharmesh Patel - WKU; Tse-hong Chen - Purdue University; Ka Wai Kwong - WKU
- 2:30 pm Chemistry: Organic/Inorganic Section meeting

## COMPUTER AND INFORMATION SCIENCES

Jerzy Jaromczyk, Chair  
University of Kentucky

Muzaffar Ali, Secretary  
Bellarmine University

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 312

- 1:00 pm **Determining a reference interactome for stable heart disease utilizing molecular structure for informed model selection.** Patrick Trainor, Shesh Rai - University of Louisville
- 1:15 pm **Cloud Computing for Hands-On Bioinformatics Education.** Harrison Inocencio, Deavin Hester, Laura Lodder, Justin Moore, Bailey Phan, Andrew Tapia, Neil Moore, Mark Farman, Jerzy Jaromczyk , Luke Decastro - University of Kentucky
- 1:30 pm **Adaptive Topic Mining from Social Media Streams.** Gopi Chand Nutakki, Olfa Nasraoui - University of Louisville
- 1:45 pm **BayesianGLasso: software for integrating a priori knowledge and empirical data utilizing a graphical model framework.** Patrick Trainor, Andrew DeFilippis, Shesh Rai - University of Louisville
- 2:00 pm **Password cracking performance testing comparing GPU vs CPU performance using Hashcat.** Deven Rataiczak - Bellarmine University
- 2:15 pm Computer & Information Sciences Section meeting

## ECOLOGY AND ENVIRONMENTAL SCIENCE

Maheteme Gebremedhin, Chair  
Kentucky State University

Roberta Challener, Secretary  
Bellarmine University

SATURDAY, NOVEMBER 4, 2017  
CURRIS CENTER THEATRE

- 8:00 am **Techniques in Carbon Footprinting: Achieving a Carbon Neutral Conference.** Audrey Alexander, Leslie North - Western Kentucky University
- 8:15 am **Assessing the Carbon and Energy Balance of a Grazed Pasture in Central Kentucky Using the Eddy Covariance Method.** Ian Ries, Maheteme Gebremedhin - Kentucky State University
- 8:30 am **Comparison of the Kentucky Vegetation Index of Biotic Integrity (VIBI) to a rapid wetland condition assessment (KY-WRAM).** Elizabeth Malloy, David Brown, Stephen Richter - Eastern Kentucky University; Barbara Scott - US Army Corps of Engineers; Michelle Cook - Kentucky Division of Water
- 8:45 am **Comparative Risk Evaluation of Commercially Available Organic and Conventional Fertilizers for Potential Bacterial Pat.** Meika Finger-Gray, Avinash Tope, shreya Patel - Kentucky State University

- 9:00 am **Interactive Effects of Animal Manure and Cover Crop Use in Improving Agricultural Soil Quality in Kentucky.** Sait Sarr, Maheteme Gebremedhin, Avinash Tope - Kentucky State University; Mark Coyne - University of Kentucky
- 9:15 am **Genomics of dehydration tolerance in the liverwort, *Marchantia inflexa*.** Rose Marks, D. Nicholas McLetchie - University of Kentucky
- 9:30 am **Policy communication and the Impact of Agricultural Communities on Karst Landscapes: An Example from Phong Nha-Kẻ Bàng.** Elizabeth Willenbrink, Leslie North - Center for Human GeoEnvironmental Studies at Western Kentucky University; Vu Thi Minh Nguyet - Institute of Geological Sciences, Vietnam Academy of Science; Jason Polk - Center for Human GeoEnvironmental Studies at Western Kentucky University
- 9:45 am **Development and Analysis of Avian Index of Biological Integrity for Kentucky Wetlands.** Kaitlyn Kelly, David Brown - Eastern Kentucky University
- 10:00 am Morning break
- 10:15 am **Increased accuracy in population modeling using density-dependent Leslie matrices with steady-state distribution control.** Bruce Kessler, Andrew Davis - Western Kentucky University
- 10:30 am **Prey Resource Partitioning Between Sympatric Bat Species.** Macy Kailing, Terry Derting, Gary ZeRuth - Murray State University
- 10:45 am **Factors Affecting the Diversity of Stream Salamanders in Two Watershed Systems in Central Kentucky.** Hannah Elliott, Muntathar Alshimary, Rebecca Klem, Jeremy Wilde, Roy Scudder-Davis - Berea College
- 11:00 am **Plant-Derived Volatiles Alter Plant Fitness in a Species-Specific Manner.** Grace Freundlich, Chris Frost - University of Louisville
- 11:15 am **Memory of seeds: Effect of plant volatile exposure to seeds on plant growth, development and defense across generations.** Abhinav Maurya, Christopher Frost - University of Louisville
- 11:30 am **Landscape Genetics of California Tiger Salamanders: Inferences from multiple methods.** Samantha Thomas, Jarrett Johnson - Western Kentucky University
- 11:45 am **Occupancy and Allochthony Threshold Responses of Plethodontid Stream Salamanders to Stream Conductivity.** Jacob Hutton - University of Kentucky
- 12:00 pm Lunch on your own
- 1:00 pm **A Study of Mercury in Bald Eagle Feathers and Quills.** Wendy Cecil, Cate Webb - Western Kentucky University
- 1:15 pm **Using Mobile Eye-Tracking to Inform the Development of nature tourism Destinations in Iceland.** James Graham, Leslie North - Western Kentucky University; Edward Hujbens - University of Akureyri; Elizabeth Willenbrink, Jun Yan - Western Kentucky University

- 1:30 pm **Who's the boss: Social dynamics associated with leadership in endangered Toque Macaques.** Jeeva Patabendige Rathnaweera - University of Louisville; Rajnish Vandercone - Rajarata University of Sri Lanka; Perrie Eason - University of Louisville
- 1:45 pm **An examination of fish and macroinvertebrate succession patterns after restoration of a novel stream system.** Patrick Vrablik, Michael B. Flinn - Murray State University
- 2:00 pm **Movement patterns of Silver Carp *Hypophthalmichthys molitrix* in Kentucky Lake.** Timothy Spier, Michael Flinn - Murray State University; Jessica Morris - Kentucky Department of Fish and Wildlife Resources; Neal Jackson - U. S. Fish and Wildlife Service; Allison DeRose, Brad Hartman, Dalton Lebeda - Murray State University
- 2:15 pm **Quantifying the Effects of Invasive Species on Fish Communities in Kentucky Lake: A Post-Invasion Approach.** Bradley Hartman, Timothy Spier - Murray State University
- 2:30 pm Ecology & Environmental Science Section meeting

## ENGINEERING

Aaron Daley, Chair  
Brown & Kubican, PSC

Shen Liu, Secretary  
Kentucky Community and Technical College System

SATURDAY, NOVEMBER 4, 2017  
OHIO ROOM, CURRIS CENTER

- 10:00 am **Characterization of Mechanical Properties of 3D Printed Thermoplastic Parts.** Jordan Garcia, Tyler Stoffel, John Schmidt, Alexander Bolin, David Lu, Charles Lu - University of Kentucky
- 10:15 am **Imaging of the spinal cord in pediatric patients.** Bhavesh Ramkorun - Berea College; Samantha By - Vanderbilt University; Aashim Bhatia - Vanderbilt University Children's Hospital; Bryson Reynolds - Vanderbilt University Institute of Imaging Science; Patrick Couture, Seth Smith - Vanderbilt Institute of Imaging Science
- 10:30 am **Hands-on Robotics Lab at Bellarmine University.** Christopher Steitz, Stephen Brown, Akhtar Mahmood - Bellarmine University
- 10:45 am **Flaw Characterization through Nonlinear Ultrasonics and Wavelet Cross-Correlation Algorithms.** Andrew Yee, Dylan Stewart, Gheorghe Bunget - Murray State University
- 11:00 am **Novel Approach of Wavelet Analysis for Nonlinear Ultrasonic Measurements and Fatigue Assessment of Jet Engine Components.** Cavir Gongora, Steven Treadaway, Chance Glass, Andrew Yee, Brevin Tilmon - Murray State University
- 11:15 am Engineering Section meeting



# GEOGRAPHY

Buddhi Gyawali, Chair  
Kentucky State University

Christopher Day, Secretary  
University of Louisville

SATURDAY, NOVEMBER 4, 2017  
MISSISSIPPI ROOM, CURRIS CENTER

- 8:30 am **Assessment of Vegetation Cover Change and Water Quality in Coal Mine Watersheds.** Oguz Sariyildiz, Buddhi Gyawali - Kentucky State University
- 8:45 am **Identification of Unmarked Burial Sites at Frankfort Cemetery using LiDAR and Ground Penetrating Radar.** D'Andre Garrison, Jarod Jones, Jordan Wilson, Jeremy Sandifer, Ken Bates - Kentucky State University
- 9:00 am **The Urban Heat Island: Environmental Change and the Human Condition in Detroit Michigan.** Tori Farrow, Jeremy Sandifer - Kentucky State University
- 9:15 am **Networks of Sustainability within the Iceland Whale Watching Industry.** Jason Fox, Leslie North - Western Kentucky University
- 9:30 am **Predicting the Adoption of Sustainable Agricultural Practices among Kentucky Farmers and Its Barriers.** Bijesh Mishra, Buddhi Gyawali - Kentucky State University
- 9:45 am Morning break
- 10:00 am **Exploring Relationship between community Perception and landscape change in the Eastern Kentucky.** Buddhi Gyawali, Prabisha Shrestha, Tilak Shrestha, Jeremy Sandifer - Kentucky State University
- 10:15 am **Association of land cover change trend with land ownership size at parcel level data in Breckinridge County, KY.** Prabisha Shrestha, Buddhi Gyawali, Tilak Shrestha, Jeremy Sandifer - Kentucky State University
- 10:30 am **Land Cover Classification using Landsat, NAIP images, and Accuracy enhancements.** Tilak Shrestha, Buddhi Gyawali, Kenneth Bates, Jeremy Sandifer, Prabisha Shrestha - Kentucky State University
- 10:45 am **Modeling and Evaluating the Influences of Class V Injection Wells on Urban Karst Hydrology.** James Shelley, Jason Polk, Leslie North, Nicholas Crawford - Western Kentucky University; Matt Powell - City of Bowling Green Department of Public Works
- 11:00 am **Risk analysis of bedrock collapse sinkholes in Bowling Green, Kentucky.** Patricia Kambesis - Western Kentucky University; Brittiny Moore-Kimmel - Texas State University
- 11:15 am **Estimating the Approximate Age of Unmarked Burial Sites in The Frankfort Cemetery using Spatial Interpolation.** Jordan Wilson, Jeremy Sandifer - Kentucky State University
- 11:30 am Geography Section meeting

## GEOLOGY

Ann Harris, Chair  
University of Kentucky

David Dockstader, Secretary  
Kentucky Community and Technical College System

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 228

- 9:00 am **Morphological Analysis of Astarte (Class: Bivalvia) using Geometric Morphometrics.** Randal Roberson, Michelle Casey - Murray State University
- 9:15 am **Geochemical characteristics and storm dynamics of surface waters and groundwater at Eastern Kentucky University's Meadow.** Reid Buskirk, Walter Borowski, Jonathan Malzone - Eastern Kentucky University
- 9:30 am **Patterns of nutrient export for a typical non-point source, Meadowbrook Farm, Madison County, Kentucky.** James Winter - Eastern Kentucky University
- 9:45 am Morning break
- 10:00 am **How Does Spatial Heterogeneity Influence Groundwater Flow on Ridgetops in Kentucky's Daniel Boone National Forest?** Selsey Stribling, Jonathan Malzone - Eastern Kentucky University
- 10:15 am **Modeling the groundwater storage and the groundwater recharge rate of an ephemeral wetland with Hydrus-1D.** Addison Bell, Jonathan Malzone - Eastern Kentucky University
- 10:30 am **Hydrograph Separation of Storm Flows in a Landscape with Thin Soil, Meadowbrook Farm, KY.** Laura Kelley, Sophia Chan, Jonathan Malzone, Walter Borowski - Eastern Kentucky University
- 10:45 am **Runoff generation in an ephemeral agricultural watershed with thin soil.** Sophia Chan, Laura Kelley, Jonathan Malzone, Walter Borowski - Eastern Kentucky University
- 11:00 am Geology Section meeting

## HEALTH SCIENCES

Bruce Branan, Chair  
Asbury University

Avinash Tope, Secretary  
Kentucky State University

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 155

- 1:00 pm **Determining a reference interactome for stable heart disease utilizing molecular structure for informed model selection.** Patrick Trainor, Samantha Carlisle, Shesh Rai, Andrew DeFilippis - University of Louisville

- 1:15 pm **Transcriptomics Evaluation of MDA-MB-231 Breast Cancer Cells Reveals NAT2 Transcript Production Following NAT1 Knockout.** Samantha M. Carlisle, Patrick J. Trainor, Mark A. Doll, David W. Hein - University of Louisville
- 1:30 pm Health Sciences Section meeting

## MATHEMATICS

R. Douglas Chatham, Chair  
Morehead State University

Andy Martin, Secretary  
Kentucky State University\

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 228

- 1:00 pm **Open Coverings of the Rationals Need Not Cover The Reals.** Andy Martin - Kentucky state University
- 1:15 PM **The Cubic Equation.** Dwight Smith - Big Sandy CTC
- 1:30 pm **A Perturbation Method for Determination of an Approximate Analytical Solution of a Nonlinear System of ODEs.** Austin Gabhart - Gatton Academy, Western Kentucky University
- 1:45 pm **The  $n+k$  kings problem.** R. Douglas Chatham - Morehead State University
- 2:00 pm Mathematics Section meeting

## MICROBIOLOGY

Lingyu Huang, Chair  
Kentucky State University

Joseph Mester, Secretary  
Northern Kentucky University\

SATURDAY, NOVEMBER 4, 2017  
CUMBERLAND ROOM, CURRIS CENTER

- 1:00 pm **Antimicrobial activity from bacteria found around downtown Cincinnati.** Kory Stuessel, John Carmen - Northern Kentucky University
- 1:15 pm **Inhibition of Fungal Colony Growth by UVC.** Sarah Goodrich, Colin Hartman, Mitchel Lange, Zadah Coy, Joseph Mester - Northern Kentucky University
- 1:30 pm **Emergence and divergence of influenza virus: A current perspective.** Alexander Lai - Kentucky State University
- 1:45 pm Microbiology Section meeting

## PHYSICS AND ASTRONOMY

Troy Messina, Chair  
Berea College

Marilyn Akins, Secretary  
Kentucky Community and Technical College System

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 312

- 8:00 am **A Composite View of the Composite Supernova Remnant 3C 396 (G39.2-0.3).** Thomas Pannuti - Morehead State University
- 8:15 am **The CREAM instrument on the ISS.** Scott Nutter - Northern Kentucky University
- 8:30 am **Matching Simulation Data to Calibration Data for the Silicon Charge Detector used in the ISS-CREAM Instrument.** Carter Kring - Northern Kentucky University
- 8:45 am **Calibration of the CREAM Calorimeter with CERN Beam Tests.** Tyler LaBree, Scott Nutter - Northern Kentucky University
- 9:00 am **Analysis of a Current-Mode Detector for the NOPTREX Experiment.** Daniela Olivera Velarde - Berea College; Danielle Schaper - University of Kentucky
- 9:15 am **Josephson weak links with high characteristic voltage for THz radiation detection.** Luis Gomez - Northern Kentucky University
- 9:30 am **Investigation of the Kepler Eclipsing Binary Catalog: Analysis of Targets With UNC Flags.** Garrison Turner - Big Sandy Community and Technical College
- 9:45 am **Streamlining Predictions of Temperature-Dependent Changes in Defect Properties of Intermetallic Compounds.** Caleb Kirschman, Matthew Zacate - Northern Kentucky University
- 10:00 am Morning Break
- 10:15 am **Swift Observations of the Narrow Line Seyfert 1 Galaxy RX J0134.2-4258.** Sierra Hauck, Dirk Grupe - Morehead State University
- 10:30 am **The “Hotter” Side of an X-Ray Tube.** Ignacio Birriel, Joshua Allen, Anthony Dotson - Morehead State University
- 10:45 am **The Changing Look Active Galactic Nucleus IRAS 23226-3843.** Dirk Grupe - Morehead State University
- 11:00 am **Understanding the Parameter Space of Keplerian Orbits in APOGEE.** Nathan De Lee, Kyle Houston - Northern Kentucky University; Nicholas Troup - Salisbury University; Joleen Carlberg - Space Telescope Science Institute
- 11:15 am **Redesign of Introductory Physics Labs Using Arduinos.** Troy Messina - Berea College
- 11:30 am Physics & Astronomy Section meeting

## PHYSIOLOGY AND BIOCHEMISTRY

Michael Smith, Chair  
Western Kentucky University

Julia Carter, Secretary  
Wood Hudson Cancer Research Laboratory

SATURDAY, NOVEMBER 4, 2017

BARKLEY LECTURE ROOM, CURRIS CENTER

- 1:00 pm **Identification of tRNA modification enzymes in higher eukaryotes via primer extension.** Justen Mamaril, Regan Bales, Michael Guy - Northern Kentucky University
- 1:15 pm **Physiological Characteristics of Five Bladder Cancer Cell Lines.** Kyle Damen, Ryan Moore, Alex White, Julia Carter, Bonnie Richmond - Wood Hudson Cancer Research Laboratory
- 1:30 pm **Cell proliferation and Cathepsin L expression are inversely correlated during bladder cancer progression.** Dan Stelzer, Michelle Robillard, Mariah Dooley, James Deddens. Larry Douglass. Julia Carter - Wood Hudson Cancer Research Laboratory
- 1:45 pm **The fluorescence quenching ability of graphene oxide as a platform for pathogenic double-stranded DNA sensing.** Dat Thinh Ha - Western Kentucky University
- 2:00 pm Physiology & Biochemistry Section meeting

## PSYCHOLOGY

Richard Osbaldiston, Chair  
Eastern Kentucky University

Katie Ann Skogsberg, Secretary  
Centre College

SATURDAY, NOVEMBER 4, 2017

BLACKBURN 155

- 9:00 am **Staying behind: The effect of stereotype threat on unhelpful perseverant behaviors.** Aaron Clark, Dave Porter - Berea College
- 9:15 am **Breaking the Prejudice Habit: A Longitudinal Assessment of Reducing Implicit Racial Bias.** Laura Hopkins, Nicole Stump - Centre College
- 9:30 am **The Effects of Gender, Task Difficulty, and Emotional Arousal on Perceptual Sensitivity.** Enkhjin Enkhbold - Berea College
- 9:45 am **Children's emotion understanding and regulation: Links with psychological symptoms.** Karina Cole, Ashley Hamm, Shari Kidwell - Morehead State University
- 10:00 am Morning Break

- 10:15 am **Initial Validation of the Hexaflex Process Assessment Instrument.** Aaron Ellis, John Blackledge, Shelby Humphrey, Kellen Crager, Isabella Gearhart, Rebecca Ashley - Morehead State University
- 10:30 am **The Association of Parents' Emotion Philosophy with Adolescents' Mindful Approach to Affect.** Joseph Reese, Mary Blanton, Ashley Ball, Kory Phelps, Shari Kidwell - Morehead State University
- 10:45 am **What does your Tinder profile say about you? Correlates of Tinder profile features and extroversion.** Hunter Gatewood, Lynn Haller - Morehead State University
- 11:00 am **Peer Mentoring Circles for Women STEM Faculty at Murray State University.** Maeve McCarthy, Paula Waddill, Robin Zhang, Echo Wu, Steve Cobb - Murray State University
- 11:15 am Psychology Section meeting

## SCIENCE EDUCATION

Shira Rabin, Chair

Karen Hlinka, Secretary

University of Louisville

Kentucky Community and Technical College System

SATURDAY, NOVEMBER 4, 2017  
BLACKBURN 249

- 9:00 am **Data Mining in Astronomy Using Exoplanet Data from the Space and Ground-based Telescopes.** Joseph Erskine, Jordan Dowdy, Stephen Denny, M Saleem, Akhtar Mahmood - Bellarmine University
- 9:15 am **Characterizing Epistemic Beliefs Among Scientists: Applying the Q-Method to Science Epistemology.** Katherine Ray King, Linda Fuselier, Justin McFadden - University of Louisville
- 9:30 am **Hearing eclipses: Making astronomy events accessible to visually-impaired students.** Wilson GonzalezEspada - Morehead State University; Laura Parker, Adam Stockhausen - Kentucky School for the Blind; Wanda Diaz-Merced - Office of Astronomy for Development; Allyson Bieryla - Dept. of Astronomy, Harvard University; Robert Hart - Dept. of Physics, Harvard University; Daniel Davis - Natural Sciences Lecture Demonstrations, Harvard University
- 9:45 am Morning Break
- 10:00 am **Should We Lie To Our Students?** Andy Martin - Kentucky State University
- 10:15 am **Adaptive Learning Courseware in Majors Biology Course.** Shira Rabin - University of Louisville
- 10:30 am **Strengthening Student Foundations: Strategies for Active-Learning Classrooms.** Kevin Revell - Murray State University

- 10:45 am **Low-Cost Student Research in a Non-Majors Biology Laboratory class.** Norm Strobel, KCTCS/Blugrass Community and Technical College
- 11:00 am Science Education section meeting

## ZOOLOGY

Roy Scudder-Davis, Chair  
Berea College

Oliver Beckers, Secretary  
Murray State University

### SATURDAY, NOVEMBER 4, 2017 MISSISSIPPI ROOM, CURRIS CENTER

- 1:15 pm **Phenotypic plasticity of mating calls in the katydid *Neconocephalus triops*.** Oliver Beckers - Department of Biological Sciences, Murray State University
- 1:30 pm **Exploring selection on the complex mating displays of wolf spiders in the genus *Tigrosa*.** Samuel White, Talon Garman, Laura Sullivan-Beckers - Murray State University
- 1:45 pm **Biology of the Cercaria of *Leucerothrus micropteri* (Trematoda: Azygiidae) Recovered from the Snail, *Pleurocera semicarina*.** Chi Peng - Berea College; Hanna Abe - Yale University; Ron Rosen, Brian Traw, Emma Reasoner, Marah Zeidan - Berea College
- 2:00 pm **Potential detection and utilization of substrate-borne vibrations by chameleons (*Chamaeleo calyptratus*).** Kathryn Laslie, Emily Hamilton, Michael Smith - Western Kentucky University
- 2:15 pm **Transcriptomic Response to Immune Challenge in Zebra Finch (*Taeniopygia guttata*) using RNA-seq.** Cassandra Scalf, Noah Ashley - Western Kentucky University
- 2:30 pm Zoology Section meeting

## Past Presidents of the Kentucky Academy of Science

1914-1915	Joseph H. Kastle	1966-1967	Robert M. Boyer
1915-1916	N.F. Smith	1967-1968	Paul G. Sears
1916-1917	A.M. Miller	1968-1969	Orville Richardson
1917-1918	R.C. Ballard	1969-1970	Lloyd Alexander
1918-1919	J.E. Barton	1970-1971	Karl Hussung
1919-1920	Paul P. Boyd	1971-1972	Louis Krumholz
1920-1921	W.H. Coolidge	1972-1973	Marvin W. Russell
1921-1922	George D. Smith	1973-1974	Donald Batch
1922-1923	Lucien Becker	1974-1975	Ellis V. Brown
1923-1924	W.R. Jilison	1975-1976	Frederick M. Brown
1924-1925	Cloyd M. McAllister	1976-1977	Charles Payne
1925-1926	Austin R. Middleton	1977-1978	Charles Kupchella
1926-1927	W.G. Burroughs	1978-1979	Sanford Jones
1927-1928	W.D. Valleau	1979-1980	Rudolph Prins
1928-1929	G.D. Bucker	1980-1981	John Philley
1929-1930	Frank L. Rainey	1981-1982	Ted M. George
1930-1931	V.F. Payne	1982-1983	J.G. Rodriguez
1931-1932	Anna A. Schnieb	1983-1984	Gary Boggess
1932-1933	George Roberts	1984-1985	Joe Winstead
1933-1934	John S. Bangson	1985-1986	Charles V. Covell
1934-1935	Alfred M. Peter	1986-1987	Larry Giesmann
1935-1936	J.S. McHargue	1988	William P. Hettinger, Jr.
1936-1937	Robert T. Hinton	1989	Richard N. Hannan.
1937-1938	L. Y. Lancaster	1990	Debra K. Pearce
1938-1939	W.R. Allen	1991	W. Blaine Early, III
1939-1940	A. W. Homberger	1992	Douglas L. Dahlman
1940-1941	Charles Hire	1993	Charles N. Boehms
1941-1942	G.B. Pennebaker	1994	Larry P. Elliott
1942-1943	J.T. Skinner	1995	Robert O. Creek
1943-1944	L.A. Brown	1996	William S. Bryant
1944-1945	L.A. Brown	1997	Marcus McEllistrem
1945-1946	P.J. Kolachov	1998	Patricia K. Doolin
1946-1947	Ward Sumter	1999	Gordon K. Weddle
1947-1948	Alfred Brauer	2000	Blaine R. Ferrell
1948-1949	Morris Scherago	2001	Ron Rosen
1949-1950	W.E. Blackburn	2002	Jerry Warner
1950-1951	E.P. Penrod	2003	Robert Barney
1951-1952	Harvey B. Lovell	2004	Robert Kingsolver
1952-1953	Thomas Herndon	2005	Bruce Mattingly
1953-1954	C.B. Hamann	2006	Miriam Kannan
1954-1955	R.H. Weaver	2007	Nigel Cooper
1955-1956	J.G. Black	2008	John Mateja
1956-1957	A.M. Wolfson	2009	Robin Cooper
1957-1958	William M. Clay	2010	Nancy Martin
1958-1959	William B. Owsley	2011	Barbara Ramey
1959-1960	Pete Panzera	2012	Dawn Anderson
1960-1961	H.H. LaFuze	2013	Cheryl Davis
1961-1962	Charles Whittle	2014	K.C. Russell
1962-1963	Lyle Dawson	2015	David White
1963-1964	R.A. Chapman	2016	Eric Jerde
1964-1965	C.B. Hamann	2017	Darrin Smith
1965-1966	John M. Carpenter		



## Past Meeting Locations of the Kentucky Academy of Science

1914-15	State College (presently University of Kentucky)	1970	Georgetown College
1916-28	University of Kentucky	1971	Eastern Kentucky University
1929	Berea College	1972	Morehead State University
1930	Centre College	1973	Transylvania University
1931	Transylvania University	1974	Centre College
1932	Eastern Kentucky State Teachers College	1975	University of Louisville
1933	University of Kentucky	1976	University of Kentucky
1934	Berea College	1977	Western Kentucky University
1936	University of Kentucky	1978	Eastern Kentucky University
1936	Western Kentucky State College	1979	Northern Kentucky University
1937	University of Louisville	1980	Transylvania University
1938	Morehead State Teachers College	1981	Murray State University
1939	Murray State Teachers College	1982	Ashland Oil Inc, Ashland
1940	University of Kentucky	1983	University of Louisville
1941	Eastern Kentucky State Teachers College	1984	Kentucky State University
1942	University of Kentucky	1985	Morehead State University
1943	University of Louisville	1986	Lexington, Kentucky (with SSMA)
1944	University of Kentucky	1987	Western Kentucky University
1945	No Annual Meeting	1988	Eastern Kentucky University
1946	University of Louisville	1989	University of Kentucky
1947	Western Kentucky State College	1990	Northern Kentucky University
1948	University of Kentucky	1991	Owensboro, Kentucky
1949	Cumberland Falls State Park	1992	Ashland Community College
1949	Eastern Kentucky State College	1993	Georgetown College
1950	University of Louisville	1994	Paducah Community College
1951	University of Kentucky	1995	Western Kentucky University (Joint meeting with the Tennessee Academy of Science)
1952	Georgetown College	1996	Kentucky State University
1953	Ashland & University of Kentucky	1997	Morehead State University
1954	Berea College & University of Louisville	1998	Jefferson Community College, S.W.
1955	Cumberland Falls State Park & Kentucky State College	1999	Eastern Kentucky University
1956	Kentucky Dam Village	2000	University of Kentucky
1956	Eastern Kentucky State College	2001	Middle Tennessee State (Joint meeting with the Tennessee Academy of Science)
1957	Western Kentucky State College, Mammoth Cave National Park & Berea College	2002	Northern Kentucky University
1958	Natural Bridge State Park & University of Kentucky	2003	Western Kentucky University
1959	Lake Cumberland State Park & & Western Kentucky State College	2004	Murray State University
1960	Murray State College & University of Louisville	2005	Eastern Kentucky University
1961	Morehead State College & University of Louisville	2006	Morehead State University
1962	Eastern Kentucky State College	2007	University of Louisville
1963	University of Kentucky	2008	University of Kentucky
1964	Morehead State College	2009	Northern Kentucky University
1965	University of Kentucky	2010	Western Kentucky University
1966	Kentucky Wesleyan College	2011	Murray State University
1967	University of Louisville	2012	Eastern Kentucky University
1968	Western Kentucky University	2013	Morehead State University
1969	Murray State University	2014	Lexington, Kentucky
		2015	Northern Kentucky University
		2016	University of Louisville
		2017	Murray State University

# Next KAS Annual Meeting

The 104th Annual Meeting of the  
Kentucky Academy of Science

**will be hosted by**



**November, 2018**

## **2017 Enhanced Affiliates**

**Faculty, Staff, and Students at these institutions  
can join KAS at no cost:**

Alice Lloyd College

Asbury University

Bellarmino University

Berea College

Brescia University

Campbellsville University

Centre College

Eastern Kentucky University

Georgetown College

Kentucky Community and Technical College System (KCTCS)

Kentucky State University

Midway University

Morhead State University

Murray State University

Northern Kentucky University

Spalding University

Thomas More College

Transylvania University

University of Kentucky

University of Louisville

University of Pikeville

Western Kentucky University

## **2017 Member Institutions & Businesses**

Lindsey Wilson College

Kentucky Wesleyan College

University of the Cumberlands

Kentucky Science Center

Wood Hudson Cancer Research Laboratory

Lumins Associates