



55<sup>th</sup> Annual Meeting  
Northwest Missouri  
State University  
Maryville, Missouri  
April 12-13, 2019

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## MAS Meeting Schedule

### Friday, APR 12 All events in the J.W. Jones Student Union Ballroom

7:00-8:30 PM	Registration
7:00-8:30	MAS Social
8:00-8:30	MAS Council Meeting

### Saturday, APR 13 All Events in Garrett-Strong (GS) Hall

7:30-9:00 AM	Registration – GS Front Entrance
9:00-9:45	Welcome and Plenary – GS 2550 Dr. Himadri Chakraborty, Assoc. Prof. of Physics, Northwest Missouri State University - <i>“Collectivity, Energy Migration and Death Pairing in Matter and Antimatter”</i>
10:00-11:30	Poster Session – 2 <sup>nd</sup> & 3 <sup>rd</sup> floor hallways of GS
11:30-12:00	Business Meeting – GS3520
12:00-1:00 PM	Lunch (on own)
1:00-4:00	Oral Presentations (GS – see rooms below)

### Oral Presentation Rooms - All in Garrett-Strong Hall

Agriculture	GS 2900
Biochem, Biomed, & Biotech	GS 2550
Biology	GS 2560
Chemistry	GS 2520
Computer Science & Math	GS 1200
Conservation	GS 2950
Geology & Geosciences	GS 2850
Physics & Engineering	GS 2680
Science Education	GS 1290
Social and Behavioral Sciences	GS 1150

A complete list of abstracts for all presentations (oral and poster) can be downloaded at:

<https://www.moacademysci.org/annual-meeting/>

(Scroll down to Meeting Information and Schedule)

# Northwest Wireless Access

Connect to NWMSU\_Guest. No password required.

# Northwest Building and Parking Map



- Red stars mark the two buildings in use on Friday and Saturday for the Senior Division.
- A link to the Northwest website for this map is below.

<https://www.nwmissouri.edu/police/PDF/parkingMap.pdf>

## Letter from the Missouri Academy of Science President

Missouri Academy of Science (MAS), Northwest Missouri State University (NMSU) and I welcome you to the 55th Annual Meeting in Maryville. We are pleased that you chose to attend and hope you will make the most of your visit. The purpose of MAS and the annual meeting is “to increase scientific knowledge and aid in its diffusion, to encourage and support the scientific spirit, to promote cooperation among the scientific interests of Missouri, and to foster the education of its citizenry concerning the constructive role of science and technology in the improvement of the general welfare of our society.”

Since its founding in 1934, MAS has served to connect science professionals in Missouri. The annual meeting of the academy is an opportunity to share research, exchange ideas and to create or renew professional relationships. For many undergraduate and graduate students this may be your first introduction to a professional meeting and I hope the experience will be a memorable one. I still remember my first experience presenting research and listening to presentations at a MAS meeting.

The meeting commences on April 12 with the Junior Division of the Academy. MAS is dedicated to supporting science at the middle and high school level. The projects presented represent the time and effort of the young scientists and the faculty mentors who support their work. I would encourage those attending to show your support for these middle school and high school students who have worked so hard on their projects. An awards ceremony will follow the presentations in the Junior Division. After the awards ceremony, the NMSU Jazz Ensemble will provide entertainment for the evening social gathering.

The meeting will continue on April 13 with the Senior Division. The plenary session will feature NMSU faculty Dr. Chakraborty, who will deliver a presentation titled, “Collectivity, Energy Migration and Death Pairing in Matter and Antimatter.” The poster and oral presentations will follow as undergraduates, graduates, faculty and other professionals will present research from all areas of science.

The MAS annual meeting is made possible by the work of many dedicated professional volunteers who constitute the Academy. I want to thank our webmaster, Dr. Jeramia Ory, for his work in maintaining and improving our website and making registration an easy online process, Dr. Teresa Boman and Dr. Mary Kilmer for their coordination of the Junior Division competitions and Dr. James Gordon for the coordination of the Senior Division. These individuals, the Executive Council, Section Chairs, Business Manager along with many others make MAS possible. I would encourage anyone interested in professional service to consider becoming involved in MAS as part of the Executive Council, serving as a Senior Division Section Chair, or volunteering to serve on a standing committee.

Thanks to President Jasinski, Provost Hooyman and NMSU for extending an invitation to host the MAS meeting, and all those at NMSU who have worked to make it possible. Thanks to Jim Campbell and the local arrangements committee for their hard work throughout the year to organize the meeting and to make it successful. Thank you for attending and participating.

Have a great meeting,

Dr. Alan J. James  
President, Missouri Academy of Science, 2018-2019

## About the Academy

Scientists of the State of Missouri organized in 1934 to form the Missouri Academy of Science. By April 16, 1934, a Constitution and By-Laws were prepared and on August 14, 1934, the organization was incorporated.

The purposes of this Academy were presented in the fourth "article of agreement" as follows:

"This corporation is organized, not for profit but for the purposes of promoting the increase and the diffusion of scientific spirit, and of promoting cooperation between the scientific interests of Missouri. It proposes to accomplish these purposes:

- a. By holding meetings for the presentation of scientific papers embodying the results of original research, teaching experience, or other information of scientific interest.
- b. By fostering public interest in scientific matters, through open meetings, press releases and in such other ways as seem feasible.
- c. By encouraging local scientific organizations in every possible way.
- d. By promoting acquaintance in harmonious relationships between scientists in Missouri and among all who are interested in science.
- e. By supplying, so far as finances permit, a medium for the publication of results of original work, particularly those of special interest in this state.
- f. By concerning itself with legislation on scientific matters and providing opportunity for discussion of such legislation.
- g. By working in any and all other ways which may prove feasible, for the advancement of science in Missouri."

The Academy held its organizational meeting on April 13-14, 1934, with 250 people attending. At the December 1934, meeting, more than 400 people registered and by May 1935, there were approximately 750 members of the Academy. Statewide interest at a high level continued until activities made necessary by World War II caused disruption of Academy affairs except for some activity in the College Section.

Post-war revival of Academy activities started at a meeting on April 20, 1963, at Drury College. From the group of twelve persons who initiated the reactivation of the Academy in 1963, the membership has grown steadily to more than 800. Activities of the Academy have expanded to include the awarding of modest grants for projects proposed by high school and college students, and to sponsor the establishment of a Junior Academy of Science.

Since its reactivation in 1963, the Missouri Academy of Science has regularly held annual meetings at 16 different sites around the state. Presently, 49 colleges and universities around the State of Missouri hold an Institutional Membership status. Many industries and other private businesses are supporting the Academy with Corporate Memberships.

The Missouri Academy of Science is a non-profit organization and is supported solely by membership dues and donations. That is why we appreciate each new member and the current members who renew so faithfully each year. And it is because of their interest that the Academy continues its success as a fine scientific organization.

**2019 AGRICULTURE SECTION**

*Garrett-Strong Hall - Room 2900*

*Section Chair: Sven E. Svenson*

**TIME**

**ORAL PRESENTATION**

- 1:00 E. Ernat, T. Zell, and O. Perez-Hernandez, School of Agricultural Sciences, Northwest Missouri State University. **OVERWINTERING BEHAVIOR AND END-OF-SEASON MORTALITY OF THE SOYBEAN LEAF BEETLE (*Cerotoma trifucata* Forster) IN NORTHWEST MISSOURI.**
- 1:20 O. Pérez-Hernández, C. Olewunne, and N. Hoilett, School of Agricultural Sciences, Northwest Missouri State University, Maryville, Missouri. **PREDICTING INTENSITY LEVELS OF FROGEYE LEAF SPOT (*Cercospora sojina*) IN NORTHWEST MISSOURI.**

**2019 AGRICULTURE SECTION**  
**Garrett-Strong Hall - 2<sup>nd</sup> and 3<sup>rd</sup> Floor**  
**10:00 – 11:30 AM**  
**Section Chair: SVEN E. SVENSON**

**POSTER PRESENTATIONS**

1. S.E. Svenson, Charles Nemanick Alternative Agriculture Garden, Department of Agriculture, Southeast Missouri State University. **NATIVE PERENNIALS FOR BUTTERFLY AND POLLINATOR GARDENS: FOURTH YEAR PERFORMANCE IN SOUTHEAST MISSOURI.**
2. S. Williams, A. Coy, N. Hoilett, O. Perez-Hernandez. School of Agricultural Sciences, Northwest Missouri State University. **DO AGRICULTURAL BIOLOGICALS AFFECT CARBON DYNAMICS?**
3. V. Singamreddy, C. Kipping, N. Hoilett, and O. Perez-Hernandez. **CHARACTERIZATION AND IDENTIFICATION OF MOLD FUNGI IN HARVESTED SOYBEAN SEED IN NORTHWEST MISSOURI.**
4. V. Cloughley, K. Tharp, and O. Perez-Hernandez, School of Agricultural Sciences, Northwest Missouri State University. **EFFICACY OF A NUTRITIONAL SEED TREATMENT ON EARLY DEVELOPMENT OF SOYBEAN (*Glycine max*) IN CONTROLLED CONDITIONS.**
5. A. Coy, A. Kelly, S. Williams, N. Hoilett, and O. Perez-Hernandez. School of Agricultural Sciences, Northwest Missouri State University. **EVALUATING THE INFLUENCE OF ARGICULTURAL BIOLOGICALS ON RHIZOSPHERE ENZYME ACTIVITY.**
6. H. Dudusola, P. Oruganti, S. Soman, S. Anuluwa, N. Hoilett, O. Perez-Hernandez, and K. Royal. School of Agricultural Sciences, Northwest Missouri State University. **SPATIAL ANALYSIS OF COVER CROP INFLUENCE ON SOIL HEALTH USING KIRGING GEOSTATISTICAL PROCEDURES.**
7. P. Oruganti, H. Dudusola, S. Soman, S. Anuluwa, N. Hoilett, and O. Perez-Hernandez. School of Agricultural Sciences, Northwest Missouri State University. **IMPACT OF INTRODUCING COVER CROPS IN A CORN – SOYBEAN ROTATION SYSTEM ON SOIL HEALTH AND SOIL ENZYME ACTIVITIES.**
8. S. Anuluwa, N. Hoilett, P. Oruganti, H. Dudusola, S. Soman, and K. Royal. School of Agricultural Sciences, Northwest Missouri State University. **ASSESSING THE INFLUENCE OF COVER CROPS ON SOIL COMMUNITY CHARACTERISTICS USING PHOSPHOLIPID FATTY ACID PROFILES.**



9. S. Bugh and M. McGee, Department of Agricultural Science, Northwest Missouri State University. **SIGNIFICANCE OF ASSISTED REPRODUCTIVE TECHNOLOGY IN MODERN ANIMAL PRODUCTION SYSTEMS.**
10. E. Greeley and N. Hoilett, Department of Agricultural Sciences, Northwest Missouri State University. **UNDERSTANDING THE EFFECT OF FEEDING AND RUMINATION TIME ON PARTURITION TIME IN CATTLE TO DECREASE RISK OF DYSTOCIA.**
11. C. Mann, J. Steinkruger, A. Giri, and K.W. Lovercamp, School of Natural Sciences, University of Central Missouri. **EFFECT OF L-GLUTAMINE ON BOAR SPERM VIABILITY AND QUALITY.**
12. K. Clapp<sup>1</sup>, R. Sounders<sup>2</sup>, and N. Hoilett<sup>1</sup>. School of Agricultural Sciences, Northwest Missouri State University<sup>1</sup>; Natural Resource Conservation Services<sup>2</sup>. **EXPLORING CAREER OPPORTUNITIES FOR STUDENTS THROUGH THE USDA PATHWAYS INTERNSHIP PROGRAM.**
13. P. Mayhood<sup>1</sup>, B. Mirza<sup>1</sup>, and M. Burton<sup>2</sup>, Department of Biology<sup>1</sup>, Department of Agriculture<sup>2</sup>, Missouri State University. **16S RDNA SEQUENCING OF RHIZOBIAL AND NON-RHIZOBIAL ENDOPHYTES WITHIN INDIVIDUAL ROOT NODULES OF SOYBEAN.**

MISSOURI ACADEMY OF SCIENCE

*2019 Biochemistry, Biomedicine, & Biotechnology Section*

*Garrett-Strong Hall - Room 2550*

*Section Chair: Joshua Smith*

**TIME**

**ORAL PRESENTATION**

- 1:00 C. Espinoza Patharkar<sup>1</sup> and O. R. Patharkar<sup>2</sup>, <sup>1</sup>Department of Science, Technology and Mathematics, Lincoln University, <sup>2</sup>Department of Biological Sciences, University of Missouri-Columbia. **USING FLUORESCENCE IMAGING IN UNDERGRADUATE RESEARCH-BASED COURSES TO STUDY PLANT-MICROBE SIGNALING PATHWAYS.**
- 1:20 E. Suez, J.C. Smothers, O. Olson, and K. Kim, Department of Biology, Missouri State University. **NOVEL FUNCTION OF VPS1 ON MEMBRANE FUSION.**
- 1:40 N. Nuthikattu and J. Ory, Department of Basic Sciences, St. Louis College of Pharmacy. **A SURVEY OF DISOMY AND MITOCHONDRIAL HETEROPLASMY IN 200 STRAINS OF THE HUMAN FUNGAL PATHOGEN *CRYPTOCOCCUS NEOFORMANS*.**
- 2:00 Z. Ingram and A. Hulme, Department of Biomedical Sciences, Missouri State University. **CYCLOPHILIN A ENHANCES HIV-1 REVERSE TRANSCRIPTION IN MICROGLIAL CELLS.**
- 2:20 K.A. Yusuf and K. Kim, Department of Biology, Missouri State University. **THE USE OF PALLADIUM (Pd) AND PLATINUM (Pt) CYANOXIMATES IN THE TREATMENT OF CANCER CELLS, INITIATING A NEW APPROACH TO CANCER CHEMOTHERAPY.**
- 2:40 A. Ly, V. Nguyen, J. Smothers, S. Kottapalli, J. Villarreal, and K. Kim, Department of Biology, Missouri State University. **TYPE 5 MYOSIN FOR TRAFFICKING OF SNC1 AND VPS10 CARGO.**
- 3:00 C. Nadeau, K. Clark, A. Green, and M. Fidler, Department of Natural Science and Mathematics, University of Central Missouri. **A COMPARISON OF HUMAN PAPILLOMAVIRUS RATES BETWEEN U.S. AND JAMAICAN LOW-INCOME AREAS.**
- 3:20 R. Islam, K. Ihenacho, J. W. Park, and S. Islam, Laboratory of Biochemistry, Northwest Missouri State University. **PLASMID DNA NICKING ACTIVITY OF SOYBEAN TRYPSIN INHIBITOR AND BOVINE APROTININ.**

*2019 Biochemistry, Biomedicine, & Biotechnology Section*

*Garrett-Strong Hall – 2<sup>nd</sup> & 3<sup>rd</sup> Floor*

*10:00 – 11:30 AM*

*Section Chair: Joshua Smith*

**POSTER PRESENTATION**

1. H. Marino, R. Ulbricht, and J. Wang, Department of Biomedical Sciences, Missouri State University. **ROLE OF THE P2Y2 RECEPTOR IN GLUCOSE TOLERANCE.**
2. S. Mahl and J. Baker, Department of Biology, Missouri Western State University. **DEVELOPMENT OF STRAIN-SPECIFIC REAL-TIME PCR TO EVALUATE GROWTH COMPETITION BETWEEN FOUR BRADYRHIZOBIUM JAPONICUM STRAINS.**
3. Z. McAdams, Department of Physical & Biological Sciences, Columbia College. **DEVELOPMENT OF COMPETITIVE ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) TO QUANTIFY LEVELS OF BENZOYLECGONINE IN NATURAL WATER SYSTEMS.**
4. M. Ferrell and C. Espinoza Patharkar, Department of Science, Technology and Mathematics, Lincoln University. **INVESTIGATING THE ROLE OF SNAP33 IN CHITIN-TRIGGERED IMMUNE RESPONSES IN ARABIDOPSIS.**
5. S. Thomas, S. Sheravina, R. Ulbricht, and J. Wang. Cell and Molecular Biology Department, Biomedical Science Department, Missouri State University. **P2Y2 RECEPTOR-DEPENDENT CHANGES IN MICROVASCULAR LEUKOCYTE-ENDOTHELIAL INTERACTION.**
6. J. Nguyen, S. Paudel, D. Westenberg, and J. Smith. Department of Biological Sciences, Missouri University of Science and Technology. **A SYNTHETIC BIOLOGY APPROACH FOR ANAEROBIC DIGESTION OF GLYCEROL TO MAKE ETHANOL.**
7. R. DeWeerd and M. Manpadi, Department of Chemistry, Drury University. **NOVEL NAPHTHOQUINONE ANALOGS AND THE JAK/STAT PATHWAY.**
8. W. Redler, Department of Chemistry, Northwest Missouri State University. **THE LINK BETWEEN HIGH DOSE B VITAMINS AND CANCER.**
9. C. Landewee and A. Slusarz Department of Science, Central Methodist University. **SALT VERSUS CHLORINE: THE EFFECTS OF POOL SANITIZERS ON WATER CHEMISTRY AND BACTERIA GROWTH.**

**2019 BIOLOGY SECTION**

**Garrett-Strong Hall - Room 2560**

**Section Chair: Jim Campbell**

**TIME**

**ORAL PRESENTATION**

- 1:00 T. Roy. Department of Biology, Missouri Western State University. **REVISITING THE NORTH AMERICAN AGALINIS (FAMILY: OROBANCHACEAE).**
- 1:20 G. Dieringer and L. Cabrera R. Department of Natural Sciences, Northwest Missouri State University. **PHENOTYPIC SELECTION ON STAMINAL TRICHOMES OF AGALINIS AURICULATA (OROBANCHACEAE).**
- 1:40 N. S. Remex<sup>1</sup>, J. F. Schaefer<sup>2</sup>, D. D. Duvernell<sup>1</sup>. <sup>1</sup>Biological Sciences, Missouri University of Science and Technology. <sup>2</sup>Biological Sciences, University of Southern Mississippi. **CHARACTERIZATION OF CHROMOSOMAL TRANSLOCATIONS IN A GROUP OF KILLIFISHES USING GENOME-WIDE HIGH-DENSITY SNP MAPPING APPROACH.**
- 2:00 K. Bradley, R. Galetti and P. Klawinski. Biology Department, William Jewell College. **FIELD TESTS WITH CLAY MODELS SHOW THAT APOSEMATISM IS MORE EFFECTIVE THAN BACKGROUND COLOR MATCHING IN CATERPILLARS.**
- 2:20 C. Horstmann<sup>1</sup>, D.S. Kim<sup>2</sup> and K. Kim<sup>1</sup>. <sup>1</sup>Biology Department, Missouri State University. <sup>2</sup>Kickapoo High School, Springfield, MO. **AN INVESTIGATION AND COMPARISON OF THE EFFECTS OF SILVER AND CADMIUM NANOMATERIAL ON BAKER'S YEAST.**
- 2:40 V. Brown<sup>1</sup>, A. Bagoly<sup>1</sup>, L. Mihindikulasooriya<sup>1</sup>, A. Campbell<sup>1</sup> and J.D. Ortiz<sup>2</sup>. Department of Natural Sciences, Northwest Missouri State University. <sup>2</sup>Department of Geology, Kent State University Kent. **COMPARING METHODS FOR QUANTIFYING HARMFUL ALGAL SPECIES IN OLD WOMAN CREEK NATIONAL ESTUARY.**
- 3:00 K. Mellor, G. Hanrahan and G. Thornsberry. Department of Natural Sciences, Northwest Missouri State University. **THE EFFECT OF PEPPERMINT OIL ON BIOFILM PRODUCTION IN STAPHYLOCOCCUS EPIDERMIDIS ISOLATES.**
- 3:20 J. Winn<sup>1</sup>, E. McHugh<sup>1</sup>, D. Monismith<sup>2</sup>, Jr., J. Campbell<sup>1</sup> and A. Campbell<sup>1</sup>. <sup>1</sup>Department of Natural Sciences, Northwest Missouri State University. <sup>2</sup>559<sup>th</sup> Software Maintenance Squadron, Tinker Air Force Base. **PHYLOGENETIC COMPARISON OF CADMIUM RESISTANCE GENES IN CUPRIAVIDUS ISOLATES FROM PICHER, OK.**

- 3:40 A. Allee<sup>1</sup>, E.L. Middleton<sup>2</sup> and A.G. Tipton<sup>1</sup>. <sup>1</sup>Department of Science, Technology, and Mathematics, Lincoln University. <sup>2</sup>Indiana Department of Conservation.  
**COVER CROPS AS TOOLS: HOW SOIL FUNGAL COMMUNITIES CAN BE PREPARED FOR SUCCESSFUL PRAIRIE RESTORATION.**
- 4:00 E. Everman, K. Cloud-Richardson and S.J. Macdonald. Department of Molecular Biology, University of Kansas. **DISSECTING THE GENETIC ARCHITECTURE OF COPPER RESISTANCE.**

**2019 BIOLOGY SECTION**  
**Garrett-Strong Hall – 2<sup>nd</sup> & 3<sup>rd</sup> Floor**  
**10:00 – 11:30 AM**  
**Section Chair: Jim Campbell**

**POSTER PRESENTATIONS**

1. B. Brommet<sup>1</sup>, K. Kolan<sup>2</sup>, S. Roberts<sup>2</sup>, L. Steen<sup>3</sup>, M. Leu<sup>2</sup> and J. Semon<sup>1</sup>.  
<sup>1</sup>Department of Biological Sciences, <sup>2</sup>Department of Mechanical and Aerospace Engineering, <sup>3</sup>Department of Material Sciences and Engineering, Missouri University of Science and Technology. **A NOVEL INK FOR 3D BIOPRINTING.**
2. J. Hinsey. National Park Service, Heartland Inventory and Monitoring Network. **OUR DATA IS NOT OUR OWN – MANAGING NATURAL RESOURCE SCIENTIFIC DATA TO ENSURE DATA INTEGRITY.**
3. S. Templeton and P. Adam. Department of Natural Sciences, Northwest Missouri State University. **DIVERSITY OF SKULL MORPHOLOGY IN SEA TURTLES WITH CORRELATIONS TO DIET.**
4. A. Ginsparg, E. Thibodeau and D. Duvernell. Department of Biological Sciences, Missouri University of Science and Technology. **FISH SPECIES IDENTIFICATION PROTOCOL FOR METABARCODED ENVIRONMENTAL DNA SEQUENCES.**
5. E. Thibodeau, A. Ginsparg and D. Duvernell. Department of Biological Sciences, Missouri University of Science and Technology. **EVALUATION OF ENVIRONMENTAL DNA VERSUS TRADITIONAL SAMPLING OF FISH COMMUNITIES.**
6. P. Keyser. Department of Natural Sciences, Northwest Missouri State University. **BENTHIC MACROINVERTEBRATE DIVERSITY IN THREE WATER BODIES.**
7. J. Cobb. Department of Science, University of Central Missouri. **EFFECTS OF SALT AND OTHER MELTS ON SALINITY OF AQUATIC ENVIROMENTS.**
8. M. Haskins<sup>1</sup>, L. Bates<sup>2</sup>, L. Carter<sup>2</sup>, P. Clevenger<sup>2</sup>, R. Coffman<sup>2</sup>, L. Duncan<sup>2</sup>, T. Dunks<sup>2</sup>, S. Eckert<sup>2</sup>, D. Eddington<sup>2</sup>, S. Fossell<sup>2</sup>, B. Grant<sup>2</sup>, J. Grom<sup>2</sup>, C. Hargraves<sup>2</sup>, N. Hickman<sup>2</sup>, M. Ireland<sup>2</sup>, C. John<sup>2</sup>, S. Jones<sup>2</sup>, C. Jones<sup>2</sup>, J. Major<sup>2</sup>, A. Monteer<sup>2</sup>, E. Oldro<sup>2</sup>, B. Richards<sup>2</sup>, V. Roberts<sup>2</sup>, J. Sanders<sup>2</sup>, T. Schweder<sup>2</sup>, W. Selectman<sup>2</sup>, R. Siliven<sup>2</sup>, S. Simpson<sup>2</sup>, J. Smith<sup>2</sup>, L. Smith<sup>2</sup>, L. Suter<sup>2</sup>, J. Tate<sup>2</sup>, K. Troxel<sup>2</sup>, M. Via-Lockhart<sup>2</sup> and N. Yuille<sup>2</sup>. <sup>1</sup>Biology Department, Rockhurst University. <sup>2</sup>Chillicothe Correctional Center. **A COMPARISON OF BENTHIC ORGANISMS IN WINTER LEAF PACKS.**

9. E. Wedlock<sup>1</sup>, E. McHugh<sup>1</sup>, D. Monismith<sup>2</sup>, Jr., J. Campbell<sup>1</sup> and A. Campbell<sup>1</sup>.  
<sup>1</sup>Department of Natural Sciences, Northwest Missouri State University. <sup>2</sup>559<sup>th</sup>  
 Software Maintenance Squadron, Tinker Air Force Base. **GENOME ANALYSIS  
 OF THREE *CUPRIAVIDUS* ISOLATES FROM HEAVY-METAL  
 CONTAMINATED SOILS FROM PICHER, OKLAHOMA.**
10. F. Manoj, M. Burton, S. McElveen and B. Mirza. Department of Biology,  
 Missouri State University. **THE DIVERSITY OF *BRADYRHIZOBIUM* AND  
 NON-RHIZOBIAL ENDOPHYTES WITHIN THE ROOT NODULES OF  
 SOYBEAN.**
11. E. Grimes<sup>1</sup>, E. McHugh<sup>1</sup>, D. Monismith<sup>2</sup>, Jr., A. Campbell<sup>1</sup> and J. Campbell<sup>1</sup>.  
<sup>1</sup>Department of Natural Sciences, Northwest Missouri State University. <sup>2</sup>559<sup>th</sup>  
 Software Maintenance Squadron, Tinker Air Force Base. **ANALYSIS OF  
 GENOMES AND PHYLOGENETIC RELATIONSHIPS OF THREE  
*METHYLOBACTERIUM* ISOLATES FROM MINING SOILS OF PICHER,  
 OK.**
12. J. Kincaid and B. Mirza. Department of Biology, OEWRI, Missouri State  
 University. **BACTERIAL SOURCE TRACKING OF HUMAN, BOVINE,  
 DOG, AND GOOSE FECAL CONTAMINATION AND PATHOGENS IN  
 GREENE AND POLK COUNTY STREAMS.**
13. S. Dolan<sup>1</sup>, E. McHugh<sup>1</sup>, D. Monismith<sup>2</sup>, Jr., A. Campbell<sup>1</sup> and J. Campbell<sup>1</sup>.  
<sup>1</sup>Department of Natural Sciences, Northwest Missouri State University. <sup>2</sup>559<sup>th</sup>  
 Software Maintenance Squadron, Tinker Air Force Base. **GENOMICS OF SIX  
 HEAVY-METAL RESISTANT *METHYLOBACTERIUM* ISOLATES  
 FROM PICHER, OKLAHOMA.**
14. M. Strecker, O. Rode and C. Scholes. Department of Biology, Rockhurst  
 University. **WHICH BACTERIAL EPIPHYTES FROM MIDWESTERN  
 TREES POSSESS NITROGEN FIXING GENES?**
15. A. Mann and B. Vohra. Department of Biology, William Jewell College. **THE  
 POTENTIAL NEUROPROTECTIVE ROLE OF NICOTINAMIDE  
 MONONUCLEOTIDE ADENYLYLTRANSFERASE, STERILE ALPHA  
 AND TIR-MOTIF CONTAINING 1, AND NEUROSERPIN1 IN  
 ALZHEIMER'S-LIKE TAU-ASSOCIATED AXONAL DEGENERATION.**
16. K. Bramwell, G. Hammack, S. Stadts, S. Farris and R.J. Ulbricht. Department of  
 Biomedical Science, Missouri State University. **FLNA AND CAPS1 RNA  
 EDITING IN INFLUENZA A INFECTED MICE.**
17. C. Overmeyer, K. Jorgensen and B. Vohra. Department of Biology, William  
 Jewell College. **INVESTIGATING THE ROLE OF TOM40 IN  
 MITOCHONDRIAL FUNCTION AND NEURODEGENERATIVE  
 PATHOLOGIES.**
18. D. Ehie and K. Kim. Department of Biology and Chemistry, Missouri State University.  
**TEAB AND TEPB: GENE THERAPY ALTERNATIVES.**

19. K. Sewell and C. Lupfer. Department of Biology, Missouri State University. **INVESTIGATING NOVEL PROTEIN INTERACTIONS IN NLRP3.**
20. L. McKinney, A. Mann and B. Vohra. Department of Biology, William Jewell College. **INVESTIGATING THE POTENTIAL EFFECTS OF TRYPSIN-LIKE AND CHYMOTRYPSIN-LIKE INHIBITORS ON AXONAL DEGENERATION.**
21. O. Olson, J. Smothers, E. Suez, S. Rallabandi and K. Kim. Department of Biology, Missouri State University. **DYNAMIN-ASSISTED PROTEOLIPOSOME FUSION.**
22. P. Carroll and J. Dyer. Department of Biology, Rockhurst University. **IDENTIFYING LETHAL GENETIC MUTATIONS IN *DROSOPHILA MELANOGASTER*.**
23. L. Lamey, S.T. Boss, B. Bashaw and T. Roy. Department of Biology, Missouri Western State University. **INVESTIGATING THE HISTORICAL BIOGEOGRAPHY OF THE NORTH AMERICAN FALSE FOXGLOVES (*AGALINIS SP.*; FAMILY: OROBANCHACEAE).**
24. S. Boss, L. Lamey, B. Bashaw and T. Roy. Department of Biology, Missouri Western State University. **INVESTIGATING PHYLOGENETIC RELATIONSHIPS WITHIN THE NORTH AMERICAN FALSE FOXGLOVES (*AGALINIS SP.*; FAMILY: OROBANCHACEAE).**
25. C. Barta, B. Jenkins, D. Lindstrom, J. Reynolds, N. Karns, W. Constable, J. Phelan, M. Helsel, R. Prawitz, J. Brown, K. Moore, M. Moore, C. Thammarat. Department of Biology, Missouri Western State University. **PHYTOHORMONE TREATMENT ALLEVIATES THE NEGATIVE ALLELOPATHIC EFFECTS OF AMUR HONEYSUCKLE (*LONICERA MAACKII*) LEAF EXTRACTS ON SEED GERMINATION AND GROWTH.**
26. D. Lindstrom, B. Jenkins, R. Prawitz, M. Helsel, W.. Constable, N. Karns, J. Phelan, R. Brown, A. Jones, M. Moore, K. Moore, B. Bolander, S. Bilby, J. Brown, A. Duryee, D. Edelman, C. Gray, C. Gossett, A. Haddock, M. Klingseis, K. Leslie, E. Miles and C. Barta. Department of Biology, Missouri Western State University. **THE IDENTIFICATION OF PARTIAL PIN OAK (*QUERCUS PALUSTRIS*) AND POST OAK (*Q. STELLATA*) ISOPRENE SYNTHASE (*ISPS*) GENE SEQUENCES.**
27. R. Prawitz, M. Helsel, D. Lindstrom, B. Jenkins, W. Constable, N. Karns, J. Phelan, B. Bolander, S. Bilby, J. Brown, R. Brown, A. Duryee, D. Edelman, C. Gray, C. Gossett, A. Haddock, A. Jones, M. Klingseis, K. Leslie, E. Miles, K. Moore, M. Moore and C. Barta. Department of Biology, Missouri Western State University. ***IN SITU* DARK ADAPTATION INCREASES THE EFFICIENCY OF DNA EXTRACTION FROM MATURE PIN OAK (*QUERCUS PALUSTRIS*) LEAVES, FACILITATING GENE IDENTIFICATION STUDIES.**



**2019 CHEMISTRY SECTION**  
**Garrett-Strong Hall – Room 2520**  
**Section Chair: Shayna Burchett**

**TIME**

**ORAL PRESENTATION**

- 1:00 M. McCarthy and V. Merker. Department of Natural Sciences, Northwest Missouri State University. **SYNTHESIS AND EVALUATION OF TYLENOL DERIVATIVES.**
- 1:20 G. Fernando<sup>a</sup>, B. Ross<sup>a</sup>, Y. Ndambakuwa<sup>a</sup>, S. Santra<sup>b</sup>. <sup>a</sup>Department of Chemistry, Cottey College, <sup>b</sup>Department of Chemistry, Pittsburg State University, KS. **INVESTIGATING ANTIOXIDANTS OF AERVA LANATA AND SIMILAR HERBAL TEAS AVAILABLE IN THE SRI LANKAN, INDIAN AND US MARKETS.**
- 1:40 A. Patel, H. Shrestha, M. J. Meziani, and J. H. Campbell. Department of Natural Sciences, Northwest Missouri State University. **A FACILE STRATEGY FOR THE PREPARATION OF COMPOSITE RESIN INCORPORATING SILVER AND MAGNETIC NANOPARTICLES WITH ENHANCED ANTIBACTERIAL PROPERTIES.**
- 2:00 C.R. Scholtz, J.D. Steinkruger, C. Zhou. School of Natural Sciences, University of Central Missouri. **ZWITTERIONIC THIOLATED GOLD NANOPARTICLES AS SENSORS FOR METAL IONS IN AQUEOUS SOLUTION USING FLUORESCENT SPECTROSCOPY.**

**2019 CHEMISTRY SECTION**  
**Garrett-Strong Hall – 2<sup>nd</sup> & 3<sup>rd</sup> Floor**  
**10:00 – 11:30 AM**  
**Section Chair: Shayna Burchett**

**POSTER PRESENTATIONS**

1. J. Ballay, B. Gunsaru, and C. Roberts. Department of Chemical and Physical Sciences, Missouri Southern State University. **SYNTHESIS OF MODIFIED DIMERS OF QUINOLINE RING ANTIMALARIAL COMPOUNDS.**
2. W-J. Choi, A. Patel, N. Collins, and M. J. Meziani. Department of Natural Sciences, Northwest Missouri State University. **RAPID AND DIRECT EXFOLIATION OF BORON NITRIDE SHEETS BY SUPERCRITICAL FLUID PROCESSING.**
3. P. Corn, and S. Burchett. Department of Chemical and Physical Sciences, Missouri Southern State University. **QUANTITATIVE ALCOHOL DETERMINATION USING INFRARED SPECTROSCOPY FOR INDUSTRIAL AND EDUCATIONAL USE.**
4. L. Hedges and C. Babayco. Department of Physical and Biological Sciences, Columbia College. **QUANTIFICATION OF WIDESPREAD COCAINE CONTAMINATION ACROSS ONE-DOLLAR BILLS IN THE SOUTHERN MIDWEST.**
5. A. Malkawi, C. True, and A. Bailey. Department of Chemistry, Northwest Missouri State University. **EFFECT OF SELENIUM NUTRITION ON GIBBERELIC ACID ACCUMULATION IN SPINACH PLANTS GROWN UNDER VARIABLE ENVIRONMENTAL CONDITIONS.**
6. F. Weng, M. Whalen, A. Sengypta, and M. Manpadi. Department of Chemistry and Physics, Drury University. **SYNTHESIS AND BIOLOGICAL EVALUATION OF NOVEL UNSYMMETRICAL ANALOGUES OF CURCUMIN.**
7. D. Dan<sup>a</sup>, A. Patel<sup>a</sup>, W-J. Choi<sup>a</sup>, Z. Wang<sup>b</sup>, M. J. Meziani<sup>a</sup>, Y-P. Sun<sup>b</sup>. <sup>a</sup>Department of Natural Sciences, Northwest Missouri State University, <sup>b</sup>Department of Chemistry and Laboratory for Emerging Materials and Technology, Clemson University, Clemson, SC. **EXFOLIATION OF BORON NITRIDE SHEETS USING VARIOUS LIQUID-PHASE STRATEGIES.**

**2019 COMPUTER SCIENCE AND MATH SECTION**

***Garrett-Strong Hall – Room 1200***

***Section Chair: Chip Gubera***

**TIME**

**ORAL PRESENTATION**

- 1:00 A. Hasanbasri and Y. Liu, College of Arts and Science, Maryville University.  
**PREDICTING AND TESTING THE CHICAGO TAXI FARE.**
- 1:20 I. Shields, M. Tsai, R. Patel, and Y. Liu Department of Actuarial Science, Data  
Science and Mathematics, Maryville University of St. Louis. **OPINION MINING  
USING DEEP LEARNING WITH PRE-TRAINED MODELS**

**2019 COMPUTER SCIENCE AND MATH SECTION**

***Garrett-Strong Hall – 2<sup>nd</sup> and 3<sup>rd</sup> Floor***

***10:00 – 11:30 AM***

***Section Chair: Chip Gubera***

**POSTER PRESENTATION**

1. N. Kempf, K. Slater, D. Urban, and J. Mutua, Department of Computer Science, Mathematics, and Physics, Missouri Western State University. **A MATHEMATICAL MODEL TO EVALUATE THE EFFECTS OF VARYING ANTIBODY CONCENTRATIONS ON HIV DYNAMICS.**

**2019 CONSERVATION SECTION**

**Garrett-Strong Hall – Room 2950**

**Section Chair: Jason Willand**

**TIME**

**ORAL PRESENTATIONS**

- 1:00 K. Hill and M. Kilmer, Department of Biology and Environmental Health, Missouri Southern State University. **COLLECTION AND IDENTIFICATION OF POLLEN COLLECTED FROM BEEHIVES (*APIS MELLIFERA*) ON THE MISSOURI SOUTHERN STATE UNIVERSITY PRAIRIE.**
- 1:20 M. Kilmer and K. Hill, Department of Biology and Environmental Health, Missouri Southern State University. **BUILDING A POLLEN LIBRARY FOR MICROSCOPIC IDENTIFICATION OF LOCAL POLLEN.**
- 1:40 P. Klawinski, Department of Biology, William Jewell College. **STRANGERS IN A STRANGE LAND: 27 YEARS OF COMPETITION AMONG EXOTIC GECKOS.**
- 2:00 J. McGhee, Department of Natural Sciences, Northwest Missouri State University. **ASSESSING SUMMER POND AND LAKE INLET USE BY COPE'S GRAY TREE FROGS USING PVC PIPE TRAPS.**
- 2:20 M. Mills<sup>1</sup>, C. Watson<sup>1</sup>, H. Mills<sup>1</sup>, S. Brown<sup>1</sup>, B. Robertson<sup>1</sup>, M. DeShazo<sup>1</sup>, J. Herron<sup>1</sup>, J. Jedlicka<sup>1</sup>, and T. Quedensley<sup>2</sup>, <sup>1</sup>Department of Biology, Missouri Western State University, <sup>2</sup>Botanical Research Institute of Texas. **BIODIVERSITY AND MANAGEMENT OF MISSOURI OZARK GLADES WITH AN EMPHASIS ON AMPHIBIANS AND REPTILES.**
- 2:40 D. Ashley<sup>1</sup>, T. Aley<sup>2</sup>, C. Aley<sup>2</sup> and P. McKenzie<sup>3</sup>, <sup>1</sup>Department of Biology, Missouri Western State University, <sup>2</sup>Ozark Underground Laboratory, <sup>3</sup>United States Fish and Wildlife Service. **OBSERVATIONS ON THE USE OF ARTIFICIAL SUBSTRATES TO MONITOR POPULATIONS OF THE ENDANGERED TUMBLING CREEK CAVE SNAIL (*ANTROBIA CULVERI*).**
- 3:00 J. Willand<sup>1</sup> and S. Baer<sup>2</sup>, <sup>1</sup>Department of Biology and Environmental Health, Missouri Southern State University, <sup>2</sup>Department of Plant Biology, Southern Illinois University. **RESOURCE AVAILABILITY AND THE POTENTIAL FOR BISON INTRODUCTION IN RESTORED TALLGRASS PRAIRIE.**

**2019 CONSERVATION SECTION**  
**Garrett-Strong Hall - 2<sup>nd</sup> and 3<sup>rd</sup> Floor**

**10:00 – 11:30 AM**

**Section Chair: Jason Willand**

**POSTER PRESENTATIONS**

1. L. Germeroth, B. McLaughlin, J. Hinson, M. Long and R. Verble. Department of Biological Sciences, Missouri University of Science and Technology. **THERMAL ENVIRONMENTS OF OZARK HIGHLANDS LEAF LITTER.**
2. K. Nowack and J. McGhee, Department of Natural Sciences, Northwest Missouri State University. **WADING POOL USAGE BY TERRESTRIAL VERTEBRATES AS AN ADDITIONAL WATER SOURCE DURING DROUGHT CONDITIONS AT MOZINGO LAKE IN NORTHWEST MISSOURI.**
3. J. Porter, Department of Natural Sciences, Northwest Missouri State University. **COMPARISON OF WATERFOWL DIVERSITY BETWEEN NATURAL WETLANDS AND FLOODED AGRICULTURE FIELDS IN NORTHWEST MISSOURI.**
4. A. Reuter, M. Andres, R. Arndt and J. McGhee, Department of Natural Sciences, Northwest Missouri State University. **COMPARISON OF *Anchoa mitchilli* DIET COMPOSITION AT BACK BAY, EAST PASCAGOULA AND CENTRAL MISSISSIPPI SOUND.**
5. T. Sutton and J. McGhee, Department of Natural Sciences, Northwest Missouri State University. **NAIVE METAMORPHOSIS RATES FOR A COPE'S GRAY TREE FROG POPULATION AT MOZINGO LAKE, NODAWAY COUNTY, MISSOURI.**
6. C. Yocom-Russell and R. Verble, Department of Biological Sciences, Missouri University of Science and Technology. **USING CAMERA TRAPS TO DETECT SPECIES ON THE OZARK BIOLOGICAL RESEARCH FIELD STATION.**
7. E. Grimes<sup>1</sup>, J. McGhee<sup>1</sup> and D. Welchert<sup>2</sup>. <sup>1</sup>Department of Natural Sciences, Northwest Missouri State University. <sup>2</sup>Loess Bluffs National Wildlife Refuge. **ROAD MORTALITY OF SNAKES AT LOESS BLUFFS NATIONAL WILDLIFE REFUGE.**
8. T. Aley<sup>1</sup>, C. Aley<sup>1</sup> and D. Ashley<sup>2</sup>, <sup>1</sup>Ozark Underground Laboratory, <sup>2</sup>Department of Biology, Missouri Western State University. **THE OZARK UNDERGROUND LABORATORY AND THE TUMBLING CREEK CAVE FOUNDATION COLLABORATE TO ADVANCE KARST CONSERVATION, MANAGEMENT AND EDUCATION.**

**2019 GEOLOGY AND GEOSCIENCES SECTION**

***Garrett-Strong Hall - Room 2850***

***Section Chair: Damon Bassett***

**TIME**

**ORAL PRESENTATION**

- 1:00 S. Muttel, M. McKay, Department of Geology, Geography, and Planning, Missouri State University. **SEDIMENTARY PETROCHRONOLOGY FOR DETRITAL PROVENANCE ANALYSIS: U-PB AND RARE-EARTH ELEMENT COMPOSITIONS IN ZIRCON FROM THE MODERN MISSISSIPPI/MISSOURI RIVER DRAINAGE BASIN.**
- 1:20 D. Spurgeon<sup>a</sup>, M. McKay<sup>b</sup>, J. Fosdick<sup>c</sup>, and W. Jackson Jr.<sup>d</sup>, <sup>a,b</sup>Geography, Geology and Planning, Missouri State University, <sup>c</sup>Center for Integrative Geosciences, University of Connecticut, <sup>d</sup>Department of Earth Sciences, University of South Alabama. **U-PB AND (U-TH)/HE ZIRCON DOUBLE DATING OF PALEOZOIC APPALACHIAN VALLEY AND RIDGE STRATA: SEDIMENT ROUTING AND OROGENIC UPLIFT.**

**2019 PHYSICS AND ENGINEERING SECTION**

**Garrett-Strong Hall - Room 2680**

**Section Chair: Jim Johnson**

**TIME**

**ORAL PRESENTATION**

- 1:00 C. Sailor, Department of Mathematical Science and Physics, Westminster College. **THE BIG BANG THEORY — GEOMETRY OF THE EXPANDING UNIVERSE.**
- 1:20 Dakota Shields<sup>a</sup>, Rum<sup>a</sup> Dea, Himadri Chakraborty<sup>a</sup>, Mohamed Madjet<sup>b</sup>, and Steven Manson<sup>c</sup>, <sup>a</sup>Department of Natural Sciences, Northwest Missouri State University, <sup>b</sup>QEERI, Hamad Bin Khalifa University, <sup>c</sup>Department of Physics and Astronomy, Georgia State University. **PHOTOEMISSIONS FROM HYBRID STATES IN METASTABLE HALOGEN-ENDOFULLERENE MOLECULES.**
- 1:40 J. Shaw<sup>a</sup>, D. Monismith<sup>b</sup>, Y. Zhang<sup>a</sup>, D. Doerr<sup>a</sup> and H. S. Chakraborty<sup>a</sup>, <sup>a</sup>Department of Natural Sciences, Northwest Missouri State University, <sup>b</sup>Software Maintenance Group, Tinker AFB, Oklahoma. **WAVEPACKET DYNAMICS IN THE SCATTERING OF HYDROGEN ANIONS OFF VICINALLY NANO-STEPPED METAL SURFACES.**



**2019 PHYSICS AND ENGINEERING SECTION**

***Garrett-Strong Hall – 2<sup>nd</sup> and 3<sup>rd</sup> Floor***

***10:00 – 11:30 AM***

***Section Chair: Jim Johnson***

**POSTER PRESENTATIONS**

1. J. Sundararajan, M. Cruzan, T. Pederson, M. Yang, C. Ames, G. Cornwell, and S. Beebe, Chemical and Physical Sciences, Missouri Southern State University. **STRATEGIC APPROACH TO ACTIVE LEARNING TECHNIQUES AND EFFECTIVE PARTICIPATION IN INTERMEDIATE PHYSICS LABS.**
2. A. Sithole, J. Mutua, and G. Lack, Department of Computer Science, Mathematics, and Physics. **NON-PARAMETRIC TREND TESTS AND CHANGE-POINT DETECTION FOR RADIOACTIVE IODINE LEVELS IN DRINKING WATER IN THE U.S. MIDWEST.**
3. E. Bereyso, N. Thorsen, and S. Tewari, Cooperative Engineering Program, Missouri State University in association with Missouri University of Science and Technology. **EXPLORING VARIATION IN WATER CLARITY AND FLOW RATE OF LAB-SCALE SAND FILTERS.**

*2019 SCIENCE EDUCATION*

*Garrett-Strong - Room 1290*

*Section Chair: Gouranga Saha*

**TIME**

**ORAL PRESENTATION**

1:00 M. Yang, N. Cook, and R. Bajracharya, Chemical and Physical Sciences Department, Missouri Southern State University. **STUDENT UNDERSTANDING OF THE INVERSE-SQUARE LAW USING MULTIPLE REPRESENTATIONS.**

**2019 SOCIAL AND BEHAVIORAL SCIENCES SECTION**

***Garrett-Strong Hall – Room 1150***

***Section Chair: Mara Aruguete***

**TIME**

**ORAL PRESENTATIONS**

- 1:00 B. C. Gerhard. Department of Social and Behavioral Sciences, Lincoln University. **THE RELATIONSHIP BETWEEN DEPRESSION, SLEEP, AND DREAM CONTENT AMONG COLLEGE STUDENTS.**
- 1:20 M.S. Aruguete, P.M. Hardy, and E. Kaganda, Department of Social and Behavioral Sciences, Lincoln University. **WHY HISTORICALLY BLACK COLLEGES AND UNIVERSITIES MATTER.**