

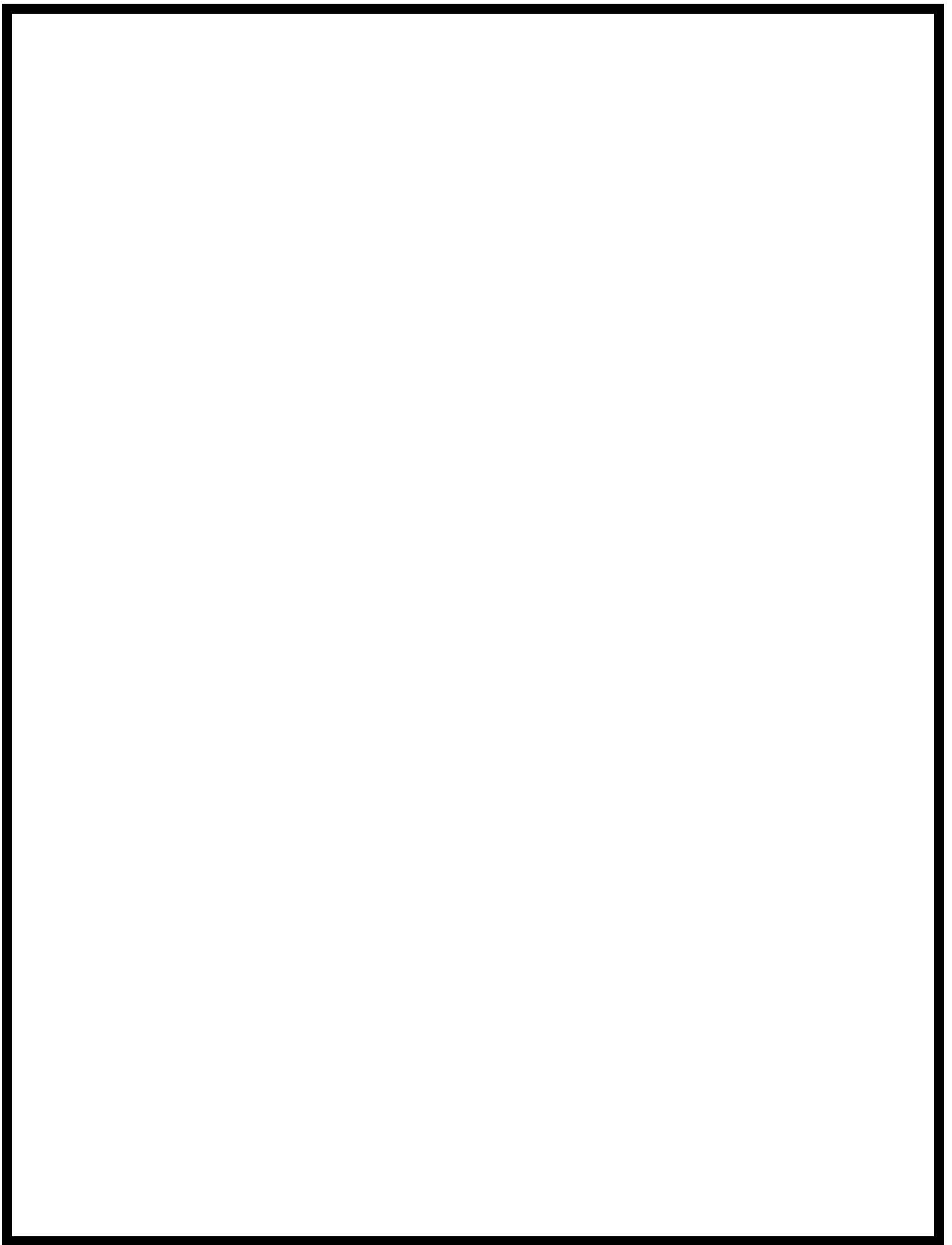
Missouri Academy of Sciences 61st Annual Meeting



Junior Division

**University of
Central Missouri**

April 11, 2025



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Kansas City Region

Open



Dear Students and Members of the Missouri Academy of Science:

It is my great honor to welcome you to the 2025 Missouri Academy of Science conference. As Provost and Vice President for Academic Affairs at the University of Central Missouri, I am proud to support this gathering dedicated to encouraging the best and brightest young scientific minds of our great state.

This event serves as a vital forum for students to share their findings, observe work by peers, and be inspired for the next experiment. Your commitment to scientific inquiry and innovation is essential in addressing today's challenges and shaping the future. Science is deeply embedded into the UCM curriculum, and we are committed to improving scientific literacy for our nation.

On behalf of UCM, I thank you for your dedication to science and learning. My colleagues are always eager to talk about UCM, showcase our facilities, and foster a relationship with you that lasts beyond these days on campus. Undergraduate research is an important component of our motto "education for service" and desire that all students graduate with an applied learning experience mentored by our excellent faculty. Our faculty are always looking for ways to redefine what is possible for you. I look forward to the discussions and research that will be showcased throughout this conference.

Best wishes for a productive and inspiring event!

Dr. Tim Crowley
Provost and Vice President for Academic Affairs
University of Central Missouri



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**UNIVERSITY OF
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The University of Central Missouri is an innovative school that offers a high-quality education while remaining one of the most affordable universities in the country.

Here, your education extends beyond books to include service-learning projects, study abroad opportunities and real-world experiences. Fully accredited by the Higher Learning Commission (HLC), UCM is consistently ranked by U.S. News & World Report, The Princeton Review, The Wall Street Journal and Fortune. At the University of Central Missouri, students can spend less without sacrificing quality. With costs lower than the Missouri and national average, UCM believes everyone deserves affordable access to a high-quality education. An impressive 94% of UCM undergraduates receive financial aid.

At UCM we strive to give you the student services, resources and support you need to experience academic success and earn your degree on time. Take classes online or on our campuses in Warrensburg and Lee's Summit, Missouri.



Awards and Sponsors

Student Awards

All finalist awards sponsored by the University of Central Missouri

Agriculture and Plant Science
Behavioral and Social Science
Biology and Environmental Science
Chemistry and Biochemistry
Computer Science and Mathematics
Engineering and Physics
Medicine and Human Health
Microbiology and Cell/Molecular Biology

Teacher Awards

All teacher awards sponsored by the University of Central Missouri

Outstanding Middle School Teacher
Outstanding High School Teacher

CAMPUS MAP



Locations for Missouri Junior Academy of Science

- 1) Elliot Student Union
- 2) W.C. Morris Science Building
- 3) Todd Dining Center

Check-in, Orientation, Awards, Finalist Sessions
 Morning presentation sessions
 Dining Hall

Visitors and guests should park in lots 32 or 68 (marked on map)

SCHEDULE OF EVENTS

Friday, April 11, 2025

8:30 AM – 10:00 AM	General Registration <i>Elliot Student Union</i>
10:00 AM – 10:30 AM	Welcome and Student Orientation <i>Elliot Student Union 237 A,B</i> Drs. Teresa Boman and Mary Kilmer, State Co-Directors
10:00 AM – 10:30 AM	Welcome and Judges Orientation <i>Elliot Student Union 237 A,B</i> Drs. Teresa Boman and Mary Kilmer, State Co-Directors
10:30 AM - 12:30 PM	Middle/High School Concurrent Paper Sessions <i>W.C. Morris Science Building</i> Specific rooms and schedule on following pages
12:30 PM – 1:45 PM	Lunch <i>Todd Hall or Off-Campus</i>
2:00 PM – 3:00 PM	Early Awards and Announcement of Finalists <i>Elliot Student Union 237 A,B</i>
3:00 PM – 5:00 PM	Middle School Finalists' Presentations <i>Elliot Student Union 235</i> High School Finalists' Presentations <i>Elliot Student Union 237 A,B</i>
6:00 PM – 6:30 PM	Middle and High School Finalist Awards Ceremony <i>Elliot Student Union 237 A,B</i>

MIDDLE SCHOOL

**Biology and Environmental Science A
Social and Behavioral Sciences A
W.C. Morris Science Building, Room 301**

10:30 Sophia Kern
10:45 Liam McKay
11:00 Tyson McKay
11:15 Gavin Kurth
11:30 Harrison Jaycox
11:45 Robert Sangster
12:00 Audrey Tellman

**Biology and Environmental Science B
Social and Behavioral Sciences B
W.C. Morris Science Building, Room 302**

10:30 Isobel Muir
10:45 Emerson Raglund
11:00 Evelyn Gaul
11:15 Adaline Anderson
11:30 Josephine Reinke
11:45 Avery Reber
12:00 Greta Schwalje

**Chemistry and Biochemistry
Computer Science and Mathematics
Engineering and Physics
W.C. Morris Science Building, Room 309**

10:30 Ava Hines
10:45 Jakob Fischer
11:00 Jonas Loughary
11:15 Samara Adam
11:30 Andrea Rasquinha
11:45 Siobhan Davis
12:00 Mason Pirtle
12:15 Elysia Anderson

MIDDLE SCHOOL (Continued)

Medicine and Human Health <i>W.C. Morris Science Building, Room 124</i>
10:30 Julia Elder
10:45 Ryan Radlund
11:00 Parker Davis
11:15 Dylan Wilkerson
11:30 Reese Hohe
11:45 Aubryn Stadler
12:00 Mazie Bach

Microbiology and Cell/Molecular Biology <i>W.C. Morris Science Building, Room 411</i>
10:30 Fabiana Guerrero-Donoso
10:45 Sophia McMann
11:00 Lia Cubero
11:15 Taylor Pliier
11:30 Kate Drinkwitz

HIGH SCHOOL

**Agriculture and Plant Science
Biology and Environmental Science**

W.C. Morris Science Building, Room 318

10:30 Andrew Foreman
10:45 Levi Snodgrass
11:00 Rachel Jacobson
11:15 Madison Cole
11:30 Maya Craven
11:45 Hannah Sargent
12:00 Ty Matthiesen

**Engineering and Physics
Computer Science and Mathematics**

W.C. Morris Science Building, Room 321

10:30 Christian Cavener
10:45 Ryan DeWitte
11:00 Colin Stokes
11:15 Damon Whittle
11:30 Riddik Steibel

**Microbiology and Cell/Molecular Biology
Medicine and Human Health
Behavioral and Social Science**

W.C. Morris Science Building, Room 322

10:30 Arissa Mills
10:45 Shravanya Shrinivas
11:00 Warda Morsey
11:15 Jeanna Jeyara
11:30 Break
11:45 Halle Reber
12:00 Lydia Turley

MIDDLE SCHOOL Presentations

MIDDLE SCHOOL
BIOLOGY AND ENVIRONMENTAL SCIENCE (A)
SOCIAL AND BEHAVIORAL SCIENCE (A)

W.C. Morris Science Building, Room 301

Biology and Environmental Science

- 10:30 AM **Sophia Kern, South Middle School**
Assessing Local Microplastic Samples Along the Beaches Of Shoal Creek Using the EPA Microplastic Beach Protocol
Sponsoring Teacher: Morgan Smith
- 10:45 AM **Liam McKay, Camdenon Middle School**
Extraction
Sponsoring Teacher: Tim Mulford
- 11:00 AM **Tyson McKay, Camdenon Middle School**
The Invasion Issue
Sponsoring Teacher: Tim Mulford
- 11:15 AM **Gavin Kurth, Camdenon Middle School**
It's in the Walls
Sponsoring Teacher: Amy Larrington
- 11:30 AM **Harrison Jaycox, St. Joseph Catholic School**
Does Radiation Produced by X-rays or Naturally Occurring in Granite Affect Radish Plants?
Sponsoring Teacher: John England

Social and Behavioral Science

- 11:45 AM **Robert Sangster, Camdenon Middle School**
Distractions' Impact on Driving: A Simulator Study
Sponsoring Teacher: Tim Mulford
- 12:00 PM **Audrey Tellman**
Scared Stiff: Investigating the Effects of Visual and Auditory Stimuli on Myotonic Goats
Sponsoring Teacher: Constance Wyrick

MIDDLE SCHOOL
BIOLOGY AND ENVIRONMENTAL SCIENCE (B)
SOCIAL AND BEHAVIORAL SCIENCE (B)

W.C. Morris Science Building, Room 302

Biology and Environmental Science

- 10:30 AM **Isobel Muir, Heritage Middle School**
Tracking the Movements of Harbo Porpoises
Sponsoring Teacher: Rebecca Groebe
- 10:45 AM **Emerson Raglund, Liberty Middle School**
The Effect of the Missouri River on the (BOD), Nitrates, Turbidity, pH, Phosphates, and (DO)
Sponsoring Teacher: Rebecca Groebe
- 11:00 AM **Evelyn Gaul, Heritage Middle School**
The Effects of Different Vitamins on Planaria Regeneration
Sponsoring Teacher: Rebecca Groebe
- 11:15 AM **Adaline Anderson, Pleasant View R6**
The Effect of Erosion Control
Sponsoring Teacher: Naomi Meinecke
- 11:30 AM **Josephine Reinke, St. Peter Catholic School**
Is Treated Wastewater Safe For Our Streams?
Sponsoring Teacher: Surani Jayasundera

Social and Behavioral Science

- 11:45 AM **Avery Reber, West Platte Middle School**
Scheduling Scholarly Success
Sponsoring Teacher: Kaitlyn Stoll
- 12:00 PM **Greta Schwalje, St. Patrick School**
The Effect of the Color of the Room on Human Reaction Time
Sponsoring Teacher: Didi Fischer

MIDDLE SCHOOL
CHEMISTRY AND BIOCHEMISTRY
COMPUTER SCIENCE AND MATHEMATICS
PHYSICS AND ENGINEERING

W.C. Morris Science Building, Room 309

Chemistry and Biochemistry

10:30 AM **Ava Hines, Camdenton Middle School**

Long Lasting Lactase

Sponsoring Teacher: Tim Mulford

10:45 AM **Jakob Fischer, St. Patrick School**

The Effect of Temperature on Battery Performance

Sponsoring Teacher: Didi Fischer

Computer Science and Mathematics

11:00 AM **Jonas, Loughary, St. Joseph Catholic School**

How Does the Type of Task Affect an AI's Ability to Master Said Task?

Sponsoring Teacher: John England

11:15 AM **Samara Adam, Islamic Greater School of Greater Kansas City**

Artificial Intelligence in Meteorology: Enhancing Tornado Prediction Through Data Science

Sponsoring Teacher: Farzana Jabeen

Physics and Engineering

11:30 AM **Andrea Rasquinha, Plaza Middle School**

Which Style of Catapult Fires the Most Consistently?

Sponsoring Teacher: Lauren Rasquinha

11:45 AM **Siobhan Davis, Walden Middle School**

"Can You Hear Me Now?!" The Effect of Position and Style of Microphone on Amplitude and Sound Quality

Sponsoring Teacher: Hannah Davis

12:00 PM **Mason Pirtle, West Platte Middle School**

Proportions in the sky

Sponsoring Teacher: Kaitlyn Stoll

12:15 PM **Elysia Anderson, George Caleb Bingham Middle School**

Rising Under Pressure

Sponsoring Teacher: Melanie Edens

**MIDDLE SCHOOL
MEDICINE AND HUMAN HEALTH**

W.C. Morris Science Building, Room 124

Medicine and Human Health

- 10:30 AM **Julia Elder, Montgomery County Middle School**
Turbo Tablets
Sponsoring Teacher: Lori Farrar
- 10:45 AM **Ryan Radlund, Camdenton Middle School**
Unblocked: A Novel Approach to Addressing the Cause of Superior Mesenteric Artery Syndrome
Sponsoring Teacher: Amy Larrington
- 11:00 AM **Parker Davis, South Middle School**
Does Athleticism Affect the Stability of a Human Pulse Rate?
Sponsoring Teacher: Morgan Smith
- 11:15 AM **Dylan Wilkerson, St. Patrick School**
The Effect of a Virtual Book on My Sleep
Sponsoring Teacher: Didi Fischer
- 11:30 AM **Reese Hohe, St. Patrick School**
The Effect of Toothpaste on Your Teeth
Sponsoring Teacher: Didi Fischer
- 11:45 AM **Aubryn Stadler, Liberty Middle School**
The Effect of Moisturizers on Skin
Sponsoring Teacher: Rebecca Groebe
- 12:00 PM **Mazie Bach**
What is the Efficiency of Over-The-Counter Hearing Aids Compared to Prescription Hearing Aids on the Ability to Perceive Sound?
Sponsoring Teacher: John England

MIDDLE SCHOOL
MICROBIOLOGY AND CELL/MOLECULAR BIOLOGY

W.C. Morris Science Building, Room 411

Microbiology and Cell/Molecular Biology

- 10:30 AM **Fabiana Guerrero-Donoso, St. Patrick School**
The Effect of Antiseptics on the Effectiveness of Killing Bacteria
Sponsoring Teacher: Didi Fischer
- 10:45 AM **Sophia McMann, St. Joseph Catholic School**
What is the Effect of Adding a Possible Chemical Signal on the Bioluminescence of Pyrocystis Fusiformis?
Sponsoring Teacher: John England
- 11:00 AM **Lia Cubero, St. Peter Catholic School**
The Effect Of UV Light Exposure On Bacteria At Varying Durations
Sponsoring Teacher: Surani Jayasundera
- 11:15 AM **Tayler Pliler, South Middle School**
The Most Effective Disinfectant Wipe
Sponsoring Teacher: Abbie Durr
- 11:30 AM **Kate Drinkwitz, South Middle School**
How Much Bacteria Does Your Water Bottle Carry?
Sponsoring Teacher: Abbi Durr

HIGH SCHOOL

Presentations

HIGH SCHOOL
AGRICULTURE AND PLANT SCIENCE
BIOLOGY AND ENVIRONMENTAL SCIENCE

W.C. Morris Science Building, Room 318

Agriculture and Plant Science

- 10:30 AM **Andrew Foreman, Emil E. Holt Senior High School**
Implementing Aquaponics in Urban Communities to Reduce the Effects of Food Insecurity
Sponsoring Teacher: Lydia Spoor
- 10:45 AM **Levi Snodgrass, Tuscumbia High School**
Moisture Management: Investigating the Effects of Different Tillage Systems on Soil Moisture Levels
Sponsoring Teacher: Constance Wyrick
- 11:00 AM **Rachel Jacobson, Timberland High School**
The Effects of Glyphosate Based Herbicide on Caenorhabditis Elegans
Sponsoring Teacher: Theresa Cordonier

Biology and Environmental Science

- 11:15 AM **Madison Cole, School of the Osage High School**
Sustainable Silk Solutions: Developing Novel Non-Woven Biocomposites from Plant Silks and PLA Fibers
Sponsoring Teacher: Constance Wyrick
- 11:30AM **Maya Craven, Joplin High School**
Evaluating Sheep Wool Pellets as a Sustainable Alternative for Water Conservation in Drought-Prone Areas
Sponsoring Teacher: Karisa Boyer
- 11:45 AM **Hannah Sargent, Joplin High School**
The Effect of Grain-Free vs Grain-Inclusive Dry Dog Food on Triiodothyronine Levels in Mice
Sponsoring Teacher: Karisa Boyer
- 12:00 PM **Ty Matthiesen, Joplin High School**
Escherichia coli Serotype O157:H7 Colonization Quantification With Varying Rates of Microplastic Particles In The Spring River Watershed Groundwater
Sponsoring Teacher: Karisa Boyer

**HIGH SCHOOL
PHYSICS AND ENGINEERING
COMPUTER SCIENCE AND MATHEMATICS**

W.C. Morris Science Building, Room 321

Physics and Engineering

- 10:30 AM **Christian Cavener, Joplin High School**
A Novel Analysis of the Redshift Dependence of the Masses of the Supermassive Black Holes of a Sample of Quasars
Sponsoring Teacher: Karisa Boyer
- 10:45 AM **Ryan DeWitte, West Platte High School**
The Effect of BB Mass on FPS and Joules
Sponsoring Teacher: Sarah DeWitte
- 11:00 AM **Colin Stokes, Tuscumbia High School**
Soaking It Up: Investigating the Effects of Gamma Irradiation on Modified LLDPE Sponges as Adsorbents for Motor Oil
Sponsoring Teacher: Constance Wyrick
- 11:15 PM **Damon Whittle, Tuscumbia High School**
A Concrete Idea: Carbon Sequestration Through Cement with Biochar and TiO₂ Additives
Sponsoring Teacher: Brett Morris

Computer Science and Mathematics

- 11:30 AM **Riddik Steibel, Wentzville Holt High School**
Metadata and the Detection of AI Generated Images
Sponsoring Teacher: Lydia Spoor

HIGH SCHOOL
MICROBIOLOGY AND CELL/MOLECULAR BIOLOGY
MEDICINE AND HUMAN HEALTH
BEHAVIORAL AND SOCIAL SCIENCE

W.C. Morris Science Building, Room 322

Microbiology and Cell/Molecular Biology

10:30 AM **Arissa Mills, Timberland High School**
PLGA Nanoparticles' Effect on Drosophila melanogaster cognitive and motor functions and Sanfilippo Syndrome C
Sponsoring Teacher: Theresa Cordonier

Medicine and Human Health

10:45 AM **Shravanya Shrinivas**
Investigating Natural Remedies: The Anti-Inflammatory Effects of Elderberry and Fenugreek on Drosophila melanogaster
Sponsoring Teacher: Lydia Spoor

11:00 AM **Warda Morsey, Thomas Jefferson Independent Day School**
The Effects of an Inflammatory compared to an Anti-Inflammatory Diet on Depression Levels
Sponsoring Teacher: Christopher Rugar

11:15 AM **Jeanna Jeyaraj, Thomas Jefferson Independent Day School**
Comparison of Complications for Unibody vs. Non-Unibody Endovascular Abdominal Aortic Aneurysm Repair Grafts
Sponsoring Teacher: Christopher Rugar

11:30 AM **Halle Reber, West Platte High School**
The Effects of the Addition of the Prosthetic to the Spine on the Alignment of the Vertebrae in Millimeters
Sponsoring Teacher: Daniel Floyd

11:45 AM **Ellis Chung, Whitefield Academy Kansas City**
SYNE2 is a Potential Biomarker Linking Central and Peripheral Neurodegeneration Associated with ALS
Sponsoring Teacher: Randolph Faustino

Social and Behavioral Science

12:00 PM **Lydia Turley, Wentzville Holt High School**
Modeling in Danio Rerio How Hyperactivity is Affected by Different Wavelengths of Light Through a Range of Ages
Sponsoring Teacher: Lydia Spoor

AWARDS

A full listing of awards and recipients from recent years can be found on the website for the Missouri Academy of the Sciences (moacademysci.org)