Arkansas Regional JSHS

JUNIOR SCIENCE AND HUMANITIES SYMPOSIUM

ARKANSAS TECH UNIVERSITY

March 11-12, 2022
Russellville, AR 72801

Program

All rooms are located on the main campus of Arkansas Tech University

FRIDAY, MARCH 11, 2022

1:30 –2:30 **Registration/check-in, Young Ballroom**
Bus parking is available in the Tucker Coliseum lot across from the East entrance to Doc Bryan

1:30-2:30 **Poster setup,** Young Ballroom
Posters must be setup by 2:30 PM

1:45-2:15 **Hotel room assignments,** McEver 121 (Young Ballroom if raining)
Teachers meet in the conference room to assign hotel rooms

2:30- 3:00 **Meeting of All Delegates,** Young Ballroom
A meeting of all teachers and delegates with the director to go over policies and procedures.

3:00-4:30 **Poster judging,** Young Ballroom
All participants should be in the Young ballroom at this time. Students not presenting a poster will participate in peer-judging of the posters.

4:30-5:30 **Awards recognition for Oral papers**

5:30 **Pizza party,** Young Ballroom
Return to hotels
The conference room at La Quinta will be available for students to meet and practice their presentations.

SATURDAY, MARCH 12, 2022

6:15-7:45am **Breakfast,** La Quinta Inn of Russellville
Students should check out before leaving the hotel for the paper presentations.

7:30 **Oral presenters load presentations on computer,** Doc Bryan Auditorium
The front doors will be unlocked at 7:30. Presentations must be loaded on the computer before 8:00.

8:00-12:00 **Presentation of Student Papers,** Doc Bryan Auditorium

12:00-2:15 **Recognition Banquet Lunch and Keynote speaker, West Dining Hall**
Guest speaker: Dr. Suparna Chatterjee

2:15-3:00 **Awards Presentations,** Doc Bryan Auditorium
Announcement of Arkansas JSHS paper and poster contest winners, announcement of the JSHS Teacher Award, and adjournment.

2022 Arkansas JSHS Speaker schedule

Name	Project Title
8:00-9:10	
Jack Lowenthal	*Testing the Efficiency of Biological Charcoal to Fight CO2 Air Pollution*
Kaneeka Chakraborty	*Change in Stress Symptoms After COVID-19 Vaccination in Middle and High School Students in Central Arkansas; A Community Survey*
Eric Hensley	*The Effects of Different Elements in Fertilizers on Soybean Growth and Development*
Katherine Tetnowski	*Mealworm Preferences in Different Environments*
9:10-9:20 – Break	
9:20-10:30	
Hayden Schueck	*The Effectiveness of the COVID-19 Vaccine*
Anu Iyer	*Systematic Parkinson Audio Recognition Construct (SPARC)*
Bhavana Sridharan	*In Vitro Evaluation of the Antioxidant Potential and Differential Effects of Punicalagin in Normal and Breast Cancer Cells*
Reagan Simril	*Bacterial Growth in Chicken*
10:35-10:50 - Coffee, juice, snack break in rotunda	
10:50-12:00	
Clement Le Sellier De Chezelles	*How Does the Mass of an Object Affect its Friction*
Shallya Anand	*The Predictive Analysis of the COVID-19 Prognosis Using Machine Learning and Artificial Intelligence Techniques*
Eric Park	*Making a Bio-Plastic Substitute for Traditional Plastic*
Mark Tudor	*Creating A Cost-Effective Microplastic Filtration Device*

Keynote Speaker

Dr. Suparna Chatterjee
Assistant Professor of Biological Sciences
Arkansas Tech University

Advantageous exploitation of microorganism in the removal of toxic pollutant

The research aimed to bioremediate toxic metal contaminants from industries, such as Chromium (VI) from the tannery effluents of the Kolkata Metropolitan Area. The purpose of the research was to save the eco-sensitive 'Ramsar site' of Kolkata. Chromium is a naturally occurring element present in the earth's crust and Cr(VI) released by the tannery industry is toxic. All organisms including humans are exposed to toxic heavy metals by inhaling ambient air, ingesting food, and drinking contaminated water. The toxicity ranges from mild to acute and chronic levels. The bacteria *Pseudomonas aeruginosa,* have been employed for the removal of Cr(VI) from synthetic solution and tannery effluents. *P. aeruginosa* removed 76.53% and 52.26% of Cr(VI) from synthetic solution and tannery effluent respectively. Fourier transform infrared spectroscopic analysis showed that the carboxyl and amino groups on the bacterial surface component bind chromium. Scanning electron microscopy and energy dispersive X-ray analysis revealed that Cr(VI) is reduced to Cr(III) on the bacterial cell surface. A lab-created mutant strain P_{UVNA} removed 96% and 81% of Cr(VI) from synthetic solution and tannery effluents respectively which was much higher compared to the wild-type strain. The low cost, high efficiency, and possibility of metal recovery envisage the potentiality of the bioremediation technique for commercial exploitation.

Judges

Head Judges
Dr. Hamed Shojaei, Head Paper Judge, Professor of Physics, ATU
Dr. Rajib Choudhury, Head Poster Judge, Assoc. Professor of Chemistry, ATU

Paper Judges Panel
Dr. Afsana Ahmed, Assist. Professor of Electrical Engineering, ATU
Dr. Azin Sanjari, Assist. Professor of Mathematics, ATU
Dr. Charles Mebi, Professor of Chemistry, ATU
Dr. Chris Kellner, Professor of Wildlife Biology, ATU
Dr. Doug Barron, Assoc. Professor of Biology, ATU
Dr. Hamed Shojaei, Professor of Physics, ATU
Dr. Jamie Stacy, Assoc. Professor of Emergency Management, ATU
Dr. Jessica Conry Young, Assoc. Professor of Physics, ATU
Dr. Jennifer Wilbanks, Senior Instructor of Psychology & Behavioral Science, ATU
Dr. Soumia Amrine, Assist. Professor of Chemistry, ATU
Dr. Suparna Chatterjee, Assist. Professor of Biology, ATU
Dr. Ty Yamashita, Professor of Biology, ATU

Planning

Arkansas Tech University Planning Committee
Dr. Jacqueline Bowman, Professor of Biology
Ms. Cheryl Chaney, Asst. Professor of Biology
Dr. Jacob Grosskopf, Assist. Professor of Geology
Dr. Amber Harrington, Assoc. Professor of Physics
Dr. Cindy Jacobs, Professor of Biology

Director, Arkansas Junior Science & Humanities Symposium
Dr. Jessica Conry Young, Assoc. Professor of Physics, ATU

2022 Arkansas Junior Science and Humanities Symposium

Rules and Expectations

- Student delegates are required to attend all sessions and meetings sponsored by the symposium (unless permission of both the Director, Dr. Young, and your official chaperone approve).
- Student delegates pledge to act in a manner that will contribute to a sense of community among participants and foster an atmosphere of mutual respect for peer group members, contributing researchers from host organizations, chaperones , and hotel and other staff.
- Student delegates will not depart the symposium site without consent from their chaperone.
- Please remember that we are guests of the LaQuinta and that we must respect the needs and rights of other guests. In particular, we request quiet after 10:00 pm.
- In-house curfew is 11:00 p.m.
- Visitation between delegates' rooms is strictly prohibited unless approved by a student's chaperone for a specific purpose.
- The symposium will not tolerate any unlawful use or possession of drugs or alcoholic beverages. Any student delegate in violation of this rule will be sent home automatically and immediately at his/her own and/or parent's expense.

Fifty-Sixth Annual Arkansas Junior Science And Humanities Symposium

In Cooperation With

U.S. ARMY RESEARCH OFFICE
Research Triangle Park, NC

U.S. OFFICE OF NAVAL RESEARCH
Arlington, VA

U.S. AIR FORCE OFFICE OF SCIENTIFIC RESEARCH
Bolling AFB, Washington DC

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Russellville, AR

OBJECTIVES

- To promote research and experimentation in the sciences, mathematics, and engineering at the high school level.
- To recognize the significance of research in human affairs, and the importance of humane and ethical principles in the application of research results.
- To search out talented youth and their teachers, recognize their accomplishments at symposia and encourage their continued interest and participation in the sciences, mathematics, and engineering.
- To expand the horizons of research-oriented students by exposing them to opportunities in the academic, industrial, and governmental communities.
- To increase the number of future adults capable of conducting research and development.