

WKU REACH 2020

Research Experiences And Creative Heights



50th Annual Student Research Conference

**Saturday
May 2, 2020**

**Western Kentucky University
Bowling Green, KY**

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SPECIAL CONFERENCE NOTE

The 2020 Student Research Conference is unique in that it is the fiftieth anniversary of the conference, and also the first instance of this conference to be conducted virtually as necessitated by the effects of the global COVID-19 pandemic. Participants with accepted abstracts are considered conference presenters, and students who choose to produce video presentations of their research or creative activity will be judged competitively.

The Student Research Council would like to recognize Dr. Cheryl Davis, Associate Provost for Research and Creative Activity and Interim Dean of the Graduate School, for her service and commitment to advancing research and creative activity at Western Kentucky University, and we dedicate the 2020 conference to her in recognition of her enduring support.

CONFERENCE SCHEDULE

All sessions of the 2020 conference are scheduled concurrently.

CONFERENCE INTRODUCTION

The WKU Student Research Conference showcases scholarly activities of graduate and undergraduate students of diverse disciplines from across the main and regional campuses. An annual tradition since 1970, the conference has provided opportunities for thousands of students to present papers, performances, posters, exhibits, and displays on their research and creative endeavors.

Scholarly activity is original and creative work that is shared with colleagues and the general public. Research is a form of scholarly activity that involves the discovery of new knowledge. Other forms of scholarship include the development of new technologies, methods, materials or uses; the integration of knowledge that leads to new understanding; and artistry that creates new insights and interpretations.* As demonstrated by the Student Research Conference, students significantly enrich their academic experiences at WKU by engaging in scholarly activity.

CONFERENCE HISTORY

WKU has a long history of promoting student research and creative activity. Between 1970 and 2002, the WKU Chapter of Sigma Xi organized and funded the WKU Student Research Conference. Sigma Xi is a national research honor society of scientists and engineers that recognizes scientific achievement. The society is a diverse organization of members and chapters dedicated to companionship in science and engineering and advancement of knowledge through research, teaching, and service. For the next three years, the conference was jointly sponsored and organized by Sigma Xi and the University Honors Program. In 2006, WKU hosted a weekend-long celebration of student scholarship that included the Potter College Undergraduate Conference on Friday and the annual WKU Student Research Conference on Saturday, the latter again sponsored by Sigma Xi and the University Honors Program. The following year, a special committee composed of representatives of each college, the University Honors Program, and Sigma Xi organized a single conference. In 2006-2007 Sigma Xi and the Office of the Provost provided financial support for the conference.

In 2008 Provost Barbara Burch created the Student Research Council, a university-wide committee charged with promoting student scholarly activity on campus and organizing the annual student conference. Since that year, the Student Research Council has organized the annual Student Research Conference, with financial support provided by the WKU Chapter of Sigma Xi, the Office of the Provost, the Office of Research and Creative Activity, and other university units. With support from the Office of the Provost and the Office of Research, in 2012 the Student Research Council developed a weeklong celebration of student scholarship called REACH (Research Experiences and Creative Heights) Week. Currently REACH is coordinated by the Office of Research and Creative Activity and spans the entire spring semester, highlighting student and faculty scholarship at events hosted by WKU colleges and units. The 50th Annual Student Research Conference is a major university-wide event of REACH.

* Weiser, C. J. (1996, March 7) The Value System of a University: Rethinking Scholarship. Retrieved 30 November 2010 at www.adec.edu/clemson/papers/weiser.html.

CONFERENCE ORGANIZATION AND SESSION WINNERS

The research and creative projects presented at the conference are organized into sessions based on the subject areas of their projects. WKU faculty, professional staff, and retired faculty and staff serve as judges to evaluate student presentations at the conference. The judges select one winner from each of the sessions listed in this program. Session winners will be announced on the Student Research Council website at www.wku.edu/studentresearch. Winners will receive award certificates, and all student presenters will receive judges' feedback via their mentors after the conference.

CONFERENCE HIGHLIGHTS

The 50th Annual WKU Student Research Conference proudly showcases **299 research projects and creative works**. A total of 340 students are presenters and co-presenters at the conference, including undergraduate, 78 master's, and doctoral students. An index of presenters is provided at the end of this program.

The interdisciplinary nature of the conference is evident in the broad range of subject areas covered in the presentations. Student participants represent diverse disciplines from 37 schools, departments, programs, and institutes in all colleges.

Agriculture	Folk Studies & Anthropology
Art	Geography & Geology
Astrophysics & Space Sciences	History
Biochemistry	Information Systems
Biology	Journalism & Broadcasting
Business Sciences	Kinesiology, Recreation & Sport
Chemistry	Management
Chinese Flagship	Marketing and Sales
Communication	Mathematics
Communication Sciences and Disorders	Modern Languages
Computer Information Systems	Music
Computer Information Technology	Philosophy & Religion
Economics	Physics & Astronomy
Educational Leadership Doctoral Program	Political Science
Engineering and Applied Sciences	Psychological Sciences
English	Psychology
Environment, Health & Safety	Public Health
Family & Consumer Sciences	Social Work
	Theatre & Dance

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session winners will be announced on the Student Research Council website at www.wku.edu/studentresearch. Winners will receive award certificates, and all student presenters receive judges' feedback via their mentors after the conference.

ACKNOWLEDGEMENTS

On behalf of the entire campus community, the WKU Student Research Council extends appreciation and congratulations to the hundreds of students participating in the conference. We applaud your talent, creativity, dedication, and commitment to making the most of your educational experience at WKU. Your passion for learning and academic excellence, as well as your motivation to overcome challenges, not only distinguishes you from your peers but also serves as an inspiration to others. We are proud of your accomplishments, and you should be too.

WKU faculty and staff who have supervised the students on their research and creative projects are referred to as "mentors" and are identified parenthetically in the detailed session listings on pages 9-25. A total of 150 faculty and staff served as mentors on the projects presented at this year's conference. We commend the mentors for their support of student scholarly activities and for their assistance in preparing students for the conference.

Funding for the 50th Annual WKU Student Research Conference and other REACH activities was provided by the Office of the Provost and Vice President for Academic Affairs and the Office of Research and Creative Activity.

The WKU Graduate School provides grants to graduate students to support scholarship that promotes inquiry and contributions to knowledge. A number of the graduate students presenting today were assisted by funding from the Graduate School.

A variety of funding opportunities are available to assist undergraduate students with their scholarship. In 2012 the Office of the Provost and Vice President for Academic Affairs and the Office of Research and Creative Activity initiated an internal funding program for undergraduate students called Faculty-Undergraduate Student Engagement (FUSE) grants. FUSE grants are designed to support students' intellectual development by fostering active engagement in the areas of research, creative and scholarly activities, and/or artistic performances. A total of 664 undergraduate students have received FUSE grants since the inception of the program, many of whom are among the conference participants this year.

Ryanne Gregory from the Office of Research and Creative Activity provided countless hours of logistical planning and expertise that were crucial to coordinating the conference.

Alicia Carter, Amy Bingham DeCesare, Bryan Lemon, Clinton Lewis, Tommy Newton, Bob Skipper, and other members of the WKU Office of Public Affairs staff provided vital assistance with electronic advertising, press and social media releases,

photography, conference artwork design, and a *View from the Hill* video segment. We appreciate the support of Will Hoagland at the *College Heights Herald*.

Diana Keeling provided expert database support to the Student Research Council.

WKU faculty members Simran Banga, Enakshi Roy, and Leah Thompson delivered informative professional development workshops in advance of the conference.

The WKU Student Research Council organizes the annual conference. Council members represent the following campus units: academic colleges, Honors College, Graduate School, University Libraries, University Senate, Gatton Academy, Sigma Xi, Student Government Association (SGA), and Office of Research and Creative Activity. Members in 2019-2020 are Scott Gordon (chair), Simran Banga, Cheryl Davis, Rynne Gregory, Lawrence Hill, Jean Neils-Strunjas, Enakshi Roy, Brigid Stakelum, Kandy Smith, Derick B. Strode, Leah Thompson, Tim Thornberry, and Haiwang Yuan. For more information about the Council, visit www.wku.edu/studentresearch. The Council sincerely appreciates the students, faculty, staff, and community members who contributed to the great success of this interdisciplinary conference, as well as the friends and family members who attended the virtual event.

Listed below are the 68 WKU faculty, staff, and retired faculty and staff who served as judges at this year's conference. We greatly appreciate the assistance of the judges and thank them for volunteering. Many are veteran judges who have supported the conference for years or decades.

Farhad Ashrafzadeh	Trish Jagers	Donna Reed
Kayla Baker	Patricia Kambesis	Claire Rinehart
Mark Berry	Molly Kerby	Millicent Ronkainen
Lauren Bland	Jae Kim	Naomi Rowland
Donna Bredenberg	Soyeon Kim	Mark Schafer
Kelly Burgess	Stephen King	Megan Schargorodski
Manohar Chidurala	Cheryl Kirby-Stokes	Nilesh Sharma
Kelly Crouch	Josh Knight	Michael Smith
Courtney Cruse	George Kontos	Roxanne Spencer
Laura DeLancey	Kim Link	Drake Stapleton
Hannah Digges Elliott	Adam Lockwood	Trini Stickle
Xiuhua Ding	Kelly Madole	Whitley Stone
Timothy Evans	Alyson Manley	Jenni Teeters
Ann Ferrell	O.E. Mansour	Leah Thompson
Jim Fulkerson	April McCauley	Danilo Toluoso
Karen Furgal	Wren Mills	Kelli Truelove
Nahid Gani	Matthew Nee	Huanjing Wang
Ellen Godbey	Pauline Norris	Catie Weaver
Thomas Gross	Sarah Ochs	Adam West
Kirolos Haleem	Sam Oldenburg	Jennifer Wilson
Sarah Herrick	Ahmet Ozkan Ozer	Kelsey Woodward
Gail Hiles	Antigoni Papadimitriou	Bangbo Yan
Jean-Luc Houle	Darnez Pope	

CONCURRENT SESSIONS

Judged presentations

Explanation of Presentation Listings

The program includes details for each presentation in the following order: presenter, co-presenters (as applicable), co-authors (as applicable), the session title, and the mentor for a project. Each WKU student was permitted to serve as the primary presenter on one presentation at the conference. Up to three co-presenters and up to six co-authors could also be listed. The sample below illustrates the format.

Sample

Presenter Last Name, First Name; Co-Presenter Last Name, First Name; Co-Author Last Name, First Name; "Title of a Great Presentation" (Mentor First Name Last Name)

Session 1

Judges: Jim Fulkerson, Soyeon Kim

Cook, Emily; Palkovic, Alexandra; Shulte, Bruce; Norman-Wilson, Grace; Maupin, Holly; Walters, Nicole; Gray, Keegan; Walters, Taylor "Comparison of GreenGuard and Best Friend Grazing Muzzles on Comfort, Fit, and Behavior in Horses" (Jennifer Gill)

Green, Griffin; Henry, Samantha; Otto, Spencer; Arnett, Scott; Toluoso, Danilo "Effects Of Versa-lifts on Back Squat Kinetics And Kinematics" (Scott Arnett)

Grigsby, Jacob; Gani, Nahid "Quantifying Tekeze River Canyon Incision on the Ethiopian Plateau From Low-temperature Apatite Thermochronology" (Nahid Gani)

Kappel, Lauren; Huskey, Steve "Do You Feel Me Now? Vibrational Communication in Veiled Chameleons (*Chamaeleo calyptratus*) During Courtship, Breeding, and Territoriality" (Steve Huskey)

Session 2

Judges: Cheryl Kirby-Stokes, Naomi Rowland, Drake Stapleton

Alcantar, Christian "Synthesis And Oxidation of Organic Substrates By Light-harvesting Metalloporphyrin" (Rui Zhang)

Houchens, Amanda "Mercury and Other Trace Metal Analysis In Bat Guano" (Cathleen Webb)

Klaine, Seth; Dames, Angeline; Bratcher, Fox; Zhang, Rui "Photochemical Generation and Oxidation Kinetic Studies of Chromium(V)-oxosalen Intermediates" (Rui Zhang)

Neupane, Narayan; Jackson, Colleen "Developing Novel Tales For Rapid Detection of Antibiotic Resistance Genes Utilizing Quantum Dots and 2d-graphene Oxide Nanosheets" (Moon-Soo Kim)

Session 3

Judges: Kelly Crouch, Xiuhua Ding, Karen Furgal

Apelt, Elizabeth; Neils-Strunjas, Jean; Crandall, Jason; Weiler, Brian; Gabbard, Annika "Reliability And Validity of An Assessment of Engagement in Nursing Home Residents During Bingocize®" (Jean Neils-Strunjas)

Duchette, Cathryn; Blankenship, Maire; Cade, W. Todd; Maples, Jill; Pearson, Kevin; Tinius, Rachel "Obesity and Physical Activity During Pregnancy have Implications for Neonatal Growth and Inflammation" (Rachel Tinius)

Rassi, Sepehr; Crandall, Jason "Bingocize® Story: Challenges of Disseminating an Exercise Intervention Program" (Jason Crandall)

Wheeler, Haley; Neils-Strunjas Jean "Let's Talk About Memory: Preventative Intervention in Elderly Adults" (Jean Neils-Strunjas)

Session 4

Judges: Donna Bredenberg, Jae Kim, Whitley Stone

Golukonda, Bala Aditya; Ellis-Griffith, Gregory; Nicholson, Thomas "Influence of Socio-economic Conditions On Drug Abuse" (Gregory Ellis-Griffith)

Laves, Eliza; Brausch, Amy "Differences In Reasons for Living And Suicide Risk in Those With Non-suicidal Self Injury (nssi) and Disordered Eating" (Amy Brausch)

Patel, Amit "Role Of Nutrients For Delaying Alzheimers" (Xiuhua Ding)

Patel, Pranavi "Association between Obstructive Sleep Apnea and Alzheimer's Disease" (Xiuhua Ding)

Session 5

Judges: Gail Hiles, Trish Jagers, Donna Reed

Bennett, Cherokee "Integrating Dialogue and Vocal Projection In Concert Dance"
(Kylene Stephens)

DiMeo, Chris "The Oceans Above Us: An Augmented Reality and Craft Experience
(Work-in-Progress)" (Mark Simpson)

Robb, Hayley "The Age Of The Advertorial: Incorporating Sponsored Content Into
The Newsroom" (Mac McKerral)

Willenbrink, Rebecca "The Secret Houses: A Study In Theatrical Translation
From Spanish To English" (Inmaculada Pertusa)

Session 6

Judges: George Kontos, Millicent Ronkainen, Mark Schafer

Fields, Madison "Agricultural Technology Use Among Ky Small & Mid-scale
Farmers & Its Impact On Farm Productivity" (Jean Dominique Gumirakiza)

Grey, Kelli "A Remote Sensing Analysis Of The April 2 & 4, 2018 Winter
Storm & Associated Severe Weather" (Josh Durkee)

Lynn, Gabriella; Willis, Victoria; Gill, Jennifer; Huskey, Steve "Evaluation Of Hoof
Pressure, Contact Area, And Force Using Fujifilm® In Booted And Shod Horses"
(Jennifer Gill)

McKinney, Dallas "Satellite and Radar Analysis of the 21 June 2019 Derecho"
(Josh Durkee)

Pestlin, Rachel; Garrison, Jessica; Suggs, Michael; O'Connell, Charlie; Wulff,
Andrew "Analysis Of Soils From Breckinridge County Mesonet Site Mqdy" (Andrew
Wulff)

Session 7

Judges: Courtney Cruse, Alyson Manley, Claire Rinehart

Anastasio, Israel "Bicycle Safety Investigation In Bowling Green, Kentucky"
(Kirolos Haleem)

Arbuckle, Lorelei; Buendia, Ali "Autonomous Systems For Student Outreach And
Work Force Development" (Ali Buendia)

Arora, Shreeya "Cloud VR Therapy For PTSD Treatment" (Michael Galloway)

Brewer, Steven "Establishment Of A Cobot Educational And Research Lab At Wku
For Both Student Engagement And Workforce Development In Kentucky" (Farhad
Ashrafzadeh)

Choate, Kyle "Flood Hazard Mitigation: Float House" (Fatemeh Orooji)

Session 8

Judges: Sarah Herrick, O.E. Mansour, Matthew Nee

Frank, Jonah "Exploring Alternatives To Smoothen Traffic Flow And Reduce Travel Time Delays During Western Kentucky University Commencements" (Kirolos Haleem)

Goetz, Jackson "Investigating Distracted Driving In Kentucky: A Driving Simulator Study" (Kirolos Haleem)

Goodwin, Timothy "Engineering Workforce Development Through Undergraduate Research" (Farhad Ashrafzadeh)

Life, Terrance "Look Who's Plowing: Adapting Agriculture To The Information Age" (Ali Buendia)

Montgomery, Austin "Methods For Improving Parking And Planning For Newer Parking Design Models At Universities: Western Kentucky University Case Study" (Kirolos Haleem)

Session 9

Judges: Pauline Norris, Nilesh Sharma, Jenni Teeters

Murphy, Matthew "Investigation Of Non-motorized (pedestrian And Bicyclist) Safety At University Campuses: Western Kentucky University Case Study" (Kirolos Haleem)

O'Boyle, Patrick; Galloway, Michael; White, Austin "Parking Solution For WKU: Car Counting With Opencv" (Michael Galloway)

Phelps, Brice; Caldwell, Katherine; Rappin, Eric "A Novel Approach To Assessing The Role Of Real-time Weather On Traffic Crash Patterns And Severity In Kentucky" (Kirolos Haleem)

Sellers, Emma "Autonomous Transportation: The Future" (Ali Buendia)

Swartz, Abigail "Analysis Of Motorcycle Crashes On Interstate-65 In Kentucky: Case Studies Of Bowling Green, Elizabethtown, And Louisville" (Kirolos Haleem)

Session 10

Judges: Timothy Evans, Sam Oldenburg, Jennifer Wilson

Bowers, Olivia "From D.C. to Kentucky: The History of the United States Senate Clerk's Desk" (Guy Jordan)

Denny, Allison "An Iron Will - Exploring Iron As A Sculptural Medium" (David Marquez)

English, April "Art and Identity: a Look into the Art of Helen Frankenthaler" (Guy Jordan)

Jones, Rook "Ambiguity? Be It So, If You Will..." (Sandra Hughes)

Adrianna Waters "'A Glorious Battle': Todd Herzog's Rhetorical Strategies In 'Survivor'" (Jeffrey Rice)

Session 11

Judges: Jean-Luc Houle, Josh Knight, Adam Lockwood

Clements, Michael "Keeping Faith: A Qualitative Study Of Religiosity Among Young Catholics In Ireland" (Elizabeth Gish, Ph. D.)

Rivera, Alex "Baudrillard And The Viral Violence Of Cyber Security" (Michael Seidler)

Sennett, Madison "Unsafe Environment Of Sweat Shops And What We Can Do To Help" (Carrie Cox)

Tawasha, Bella "What Is A Size 12? The Inconsistency And Inaccuracy Of Sizing In The Fashion Industry" (Carrie Cox)

Session 12

Judges: Mark Berry, Ann Ferrell, Trini Stickle

Adams, Mary "Interpersonal Contact And Representation Among Members Of Congress And Their Constituents: The Case Of Georgia" (Scott Lasley)

Bison, Kaitlyn "South Korean Public Perceptions Of Unification" (Timothy Rich)

Bushon, Hannah "The Evolution Of Eco-terrorism" (Soleiman Kiasatpour)

Einhorn, Madelynn "Advance Fee Fraud: How Linguistic Differences Influence Susceptibility To The Scam" (Timothy Rich)

Kelley, Aubrey "Geographic and Partisan Patterns of Support for Electoral Reforms" (Jeffrey Kash)

Session 13

Judges: Adam West, Kelsey Woodward

Dukes, Jessica "The Effect Of Size Upon Haptic Shape Discrimination" (Farley Norman)

Gambrell, Carlecia "The Influence of Prior Arrest Quality on Attitudes toward Police and Judgments of Police use of Force" (Melissa Baker)

Poppe, Victoria "Age-related Differences In The Activation Of Emotion Concepts" (Andrew Mienaltowski)

Roehm, David "The Interplay of Parenting Stress and Child Adaptability Through Parental Positive Following" (Tim Thornberry)

Session 14

Judges: Megan Schargorodski, Huanjing Wang, Bangbo Yan

Baumer, Josiah; King, Rodney "Comparative Analysis Of Microbacteriophages Jahseh And Makinzy" (Rodney King)

Mahoney, Lorenzo "Analysis of Circadian Rhythms of Phototaxis and Growth Patterns in a Green Alga Using Separate Media and Temperatures" (Sigrid Jacobshagen)

Patty, Tyler; Smith, Michael "Differences In The Inner Ear Hair Cell Densities May Explain Behavioral Responses To Sound In Two Invasive Carp Species" (Michael Smith)

Resser, John "Landscape Genetics Of Salamander Populations At Mammoth Cave National Park" (Jarrett Johnson)

Session 15

Judges: Kayla Baker, Catie Weaver

Leibman, Hannah "Evaluating the Toxicity of Titanium Nanomaterial Application Using a Worm Model" (Nilesh Sharma)

Morgan, Elizabeth; King, Rodney "Does lysogeny with bacteriophage HK022 affect host cell physiology?" (Rodney King)

Satish, Diksha; Lich, Ava; King Rodney "Comparison Of Microbacteriophages DethMetalSteve And Squeegee" (Rodney King)

Tassell, Darby; Payette, Wesley; Ashley, Noah "Effects Of Nicotine On Activity Rhythms Of Zebra Finches (taeniopygia Guttata)" (Noah Ashley)

Session 16

Judges: Nahid Gani, Kelly Madole, Michael Smith

Boyareddygari, Sai "Synthesis And Structure Of A New Metal-organic Coordination Polymer [fe(hbpc)₂(h₂o)₂]₂.5h₂o" (Bangbo Yan)

Dames, Angeline; Bratcher, Fox "Synthetic And Mechanistic Investigations On Chromium Salen-catalyzed Oxidation Of Sulfides With Iodobenzene Diacetate" (Rui Zhang)

Hesse, Megan; Lamb, Ryan; Nee, Matthew "Use of Surfaced Enhanced Raman Spectroscopy to Monitor the Pesticide Paraquat" (Matthew Nee)

Schlabach, Kenneth; Ha, Dat Think "Highly Sensitive Zinc Finger Protein Mediated Detection of Antibiotic Resistance Genes" (Moon-Soo Kim)

Session 17

Judges: Farhad Ashrafzadeh, Hannah Digges Elliott, Patricia Kambesis

Jaiswal, Chloe; Broadbent, Matthew; Nee, Matthew "Analysis of Water Models through Molecular Dynamics" (Matthew Nee)

Li, Longji; Kaur, Simrat "Synthesis And Catalytic Properties Of Zinc-histidine Framework Mimicking Carbonic Anhydrase" (Bangbo Yan)

Schlabach, Jessica; McManus, Jonnah; Freeman, Lucas; Hall, Megan; Williams, Blairanne "The Impact of Structural Modification of Oxaliplatin on Cell Survival" (Blairanne Williams)

Schulte, Connor; Ainembabazi, Lovence; Nee, Mathew "Effectiveness of Polydimethylsiloxane Beads with Incorporated Photocatalysts at Addressing Organic Water Pollution" (Matthew Nee)

Zhang, Jason; Bankhead, Bradley; Chen, Steve; Markham, Jonathan "Photocatalytic Facile Access to Cationic Enol Radical from Ynamide and Pyridine N-Oxide: Synthesis of Heterocyclic Compounds." (Yongming Deng)

Session 18

Judges: Kirolos Haleem, April McCauley, Kelli Truelove

Huang, Gloria "Modeling The Healing Response Of Diabetic Foot Ulcers With Three-dimensional Geometry" (Richard Schugart)

Panzade, Aarini "The Effect of TIMP-1, MMP-1 Levels, and Their Ratios on Healing Times and the Wound Surface Area" (Richard Schugart)

Ryumae, Mina; Whitaker, Caeden "Orientation And Backpropagation Techniques For Dots And Boxes Monte Carlo Tree Search" (Uta Ziegler)

St. Clair, Ryan "Simulating Vibrations For Piezoelectric Devices" (Ozkan Ozer)

Wyllie, Sierra; Zheng, Bruce; Abumuhfouz, Ismail "Network Intrusion Detection In Drones Using Machine Learning" (Ismail Abumuhfouz)

Session 19

Judges: Laura DeLancey, Thomas Gross, Antigoni Papadimitriou

Ateyeh, Ahmad "A Novel Approach to Simulating Electrohydraulic Forming" (Morteza Nurcheshmeh)

Priddy, William; Camfield, Caroline; Ashrafzadeh, Farhad; Buendia, Ali "CoRobotics: Workforce development in the age of intelligent robots" (Ali Buendia)

Skaggs, Dylan "IEEE Southeast Con. Hardware/Robotics Competition" (Mark Cambron)

Whittle, Elijah "Exploring Dots And Boxes Endgame Strategies Through Monte Carlo Tree Search" (Uta Ziegler)

Session 20

Judges: Ellen Godbey, Molly Kerby, Roxanne Spencer

Caldwell, Katherine; Montgomery, Austin "Traffic Safety Evaluation Of Median Cable Barriers And Strong-post W-beam Guardrails On Interstate-65 In Alabama" (Kirolos Haleem)

Camfield, Caroline "Learning to Jump like Corbin Bleu: The Physics Behind Jump Rope" (Julie Ellis)

Pierce, Jake; Addison, Paul; Adams, Jonathan; Buendia, Ali; Ashrafzadeh, Farhad; Haleem, Kirolos "Building A Research Foundation For Assessing The Safety Of Autonomous Vehicle-to-pedestrian Technology In Kentucky" (Ali Buendia)

Tungate, Alex "Reduction Noise And Vibration In A Washing Machine With An Unbalanced Load" (Morteza Nurcheshmeh)

Session 21

Judges: Wren Mills, Sarah Ochs, Leah Thompson

Campbell, Olivia; Rappin, Eric "Quantifying Nocturnal Temperature Inversion Formation With Kentucky Mesonet Observations" (Eric Rappin)

Cowherd, Rebekah "Utilizing Gis Systems To Determine Pesticide Presence In Kentucky Waterways" (Amy Nemon)

Mitchell, Lea; Givan, Ethan; McClanahan, Kegan "Developing Clean Water Facility Pretreatment Maximum Contaminant Levels for Aluminum" (Jason Polk)

Webster, Trevor; Crowder, Margaret "Use Of Concept Sketching In Introductory Geology Classrooms" (Margaret Crowder)

Wright, Emily "Examining Recent Volcanic Activity To Understand The Volcanic Hazard And Societal Risk In Hawaii" (Nahid Gani)

Session 22

Judges: Manohar Chidurala, Ahmet Ozkan Ozer

Hebenstiel, Lars "Experimental Study Of Stochastic Resonance In Bistable Systems" (Ivan Novikov)

Humphrey, Cody "Equation of State for a Quark Star Pressure Gradient Phase Transition Layer" (Keith Andrew)

Hurley, Jordyn; Er, Ali; Belekov, Ermek "Silver Nanoparticles As Antimicrobial Agents" (Ali Er)

Menon, Ashwin; Er, Ali; Belekov, Ermek "The Synthesis Of Silver Nanoparticles In Different Mediums Though Laser Ablation For Use In Photodynamic Therapy" (Ali Er)

Suarez, David "Quark Stars, Modified L-J Potentials and the Equation of State" (Keith Andrew)

Session 23

Judges: Kelly Burgess, Darnez Pope, Danilo Tolusso

Banaszak, Chloe; Baker, Melissa "Is Eyewitness Description Accuracy Of Suspects Related To Eyewitness Identification Accuracy Of Suspects In Lineups?" (Melissa Baker)

Farmer, Sofia "Queers Issues In Education: What Might Teachers Need To Know?" (Lisa Duffin-Rexroat)

Henneberg, Licia "Does Competition Change the Relative Importance of Absolute and Relative Standing Feedback from Standardized Testing?" (Qin Zhao)

Martin, Jocelyn "Age-related Differences In The Granularity Of Activation Of Emotion Concepts" (Andrew Mienaltowski)

Wink, Adam; Bailey, Alyssa; Cherry, Rachel; Nguyen, Phillip; Smith, McPherson; Wininger, Steven "Comparing Content of Attention Chapters between Cognition vs. Sport Psychology Textbooks" (Steven Wininger)

Session 24

Judges: Lauren Bland, Stephen King, Kim Link

Elder, Madeline; Baker, Kayla; Schafer, Mark "The Effects Of Manual Therapy On Stroke Patients Who Have Upper Extremity Impairment" (Kayla Baker)

Hartman, Sarah; Basham, Jacqueline; Taylor, Ritchie "Atrazine Concentrations In Raw & Finished Water Supplies In Three Kentucky Counties" (Jacqueline Basham)

Hegde, Krupa; Ding, Xiuhua; Gardner, Marylin "The Role Of Sleep Apnea In Apoe-alzheimer's Disease Pathway" (Xiuhua Ding)

Johnson, Matthew "Maternal Mood during Pregnancy may influence Cortisol Levels in Cord Blood" (Rachel Tinius)

Nasta, Sanjana "WKU Students' Perceptions About the Human Papilloma Virus (HPV)" (Grace Lartey)

ACCEPTED UNJUDGED RESEARCH PROJECTS

Acosta, Camille "They Tried To Bury Us; They Didn't Know We Were Seeds: A Folk Art Response To Tragedy In Chuco Town" (Timothy Evans)

Allgeier, Benjamin "Justified Housing" (Shahnaz Aly)

Almarri, Hamad "Bowling Green's Hotel Suites" (Shahnaz Aly)

Alnasser, Dalal "The Architecture Of Community" (Shahnaz Aly)

Alsop, Zoe "Body Satisfaction In Men" (Frederick Grieve)

Anders, Bryan "Molecular Evolution of the cancer-related Cyclin D1 gene (CCND1)" (Chandra Emani)

Anderson, Isaac; Boils, David; Powers Jackson; Gelderman, Richard; Roberts-Nault, Annabelle; Coomes, Jessica; Ditto, Kayla "Discovery of the Changes in the Orbit of an Eclipsing Binary Star System" (Richard Gelderman)

Antle, Austin "Synthesis Of Core/shell Nanoparticles In Ionic Liquids" (Lawrence Hill)

Ashley, Katherine "Impact Of Factors On Persistence Of High Incidence And Mortality Of Lung Cancer In Appalachia Kentucky" (Michelle Reece)

Bailey, Alyssa; Winger, Steven; Wink, Adam; Cherry, Rachel; Nguyen, Phillip; Smith, McPherson "Multi-Tasking while Cycling: Impact on Self-Selected Exercise Intensity" (Steven Winger)

Bankhead, Bradley; Markham, Jonathan; Deng, Yongming; Zhang, Jason; Chen, Steve "Photoinduced Facile Generation Of Vinyl Radical From Alkynes: Metal-free Synthesis Of 3-aza-bicyclo[3.1.0]hexan-2-ones" (Yongming Deng)

Baxter, Morgan "The Memphis Massacre of 1866" (Marko Dumančić)

Beard, Cory "Automated Sorting System Teaching Aid" (Asghar Rezasoltani)

Begley, Mary "Cobalt-ruthenium Metal-organic Framework For Photocatalytic Reduction Of Carbon Dioxide" (Bangbo Yan)

Belekov, Ermek; Kholikov, Khomidkhodza; Cooper, Lauren; Devarakonda, Koushik "Light-induced Pathogenic Bacterial Deactivation By Using Graphene Quantum Dot And Methylene Blue" (Ali Er)

Bergamini, Hannah "Assessing Access To Healthcare For Limited English Proficient Patients" (Kara Haughtigan)

Biscotto, Sara "Synthesis And Purification Of Ligand Used For Radical Polymerization" (Lawrence Hill)

Bishop, Riley "Calibration And Determination Of King's Law Constants For A Hot-film Anemometer" (Manohar Chidurala)

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