

52nd Annual
**STUDENT
RESEARCH
CONFERENCE**

SATURDAY, MARCH 26
DOWNING STUDENT UNION



Western Kentucky University • Bowling Green, KY

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Conference Schedule

Student and Judge Registration (8:00 am – 3:15 pm)

- Third Floor Lobby
- *Ongoing throughout the day*
- *Register at least 30 minutes before session*

Conference Keynote Lecture (8:30 am – 9:30 am)

- Dr. Farhad Ashrafzadeh
- "Research as a Self-Discovery Process: Identifying and Fostering Your Inner Talents"
- DSU Room 3020

Flash Talks (9:30 am – 10:15 am)

- DSU Room 3020

Morning Break (10:15 am – 10:30 am)

Concurrent Sessions I (10:30 am – 12:00 pm)

- Oral Papers and Performances in Rooms 2113, 2123, 2124, and 3003 – 3007
- Posters in Second Floor Atrium
 - Presenters should remove their posters at the end of the session

Lunch Break (12:00 pm – 1:15 pm)

- Presenters, co-presenters, and judges with name badge receive free lunch ticket at Fresh Food Company entrance

Concurrent Sessions II (1:30 pm – 3:00 pm)

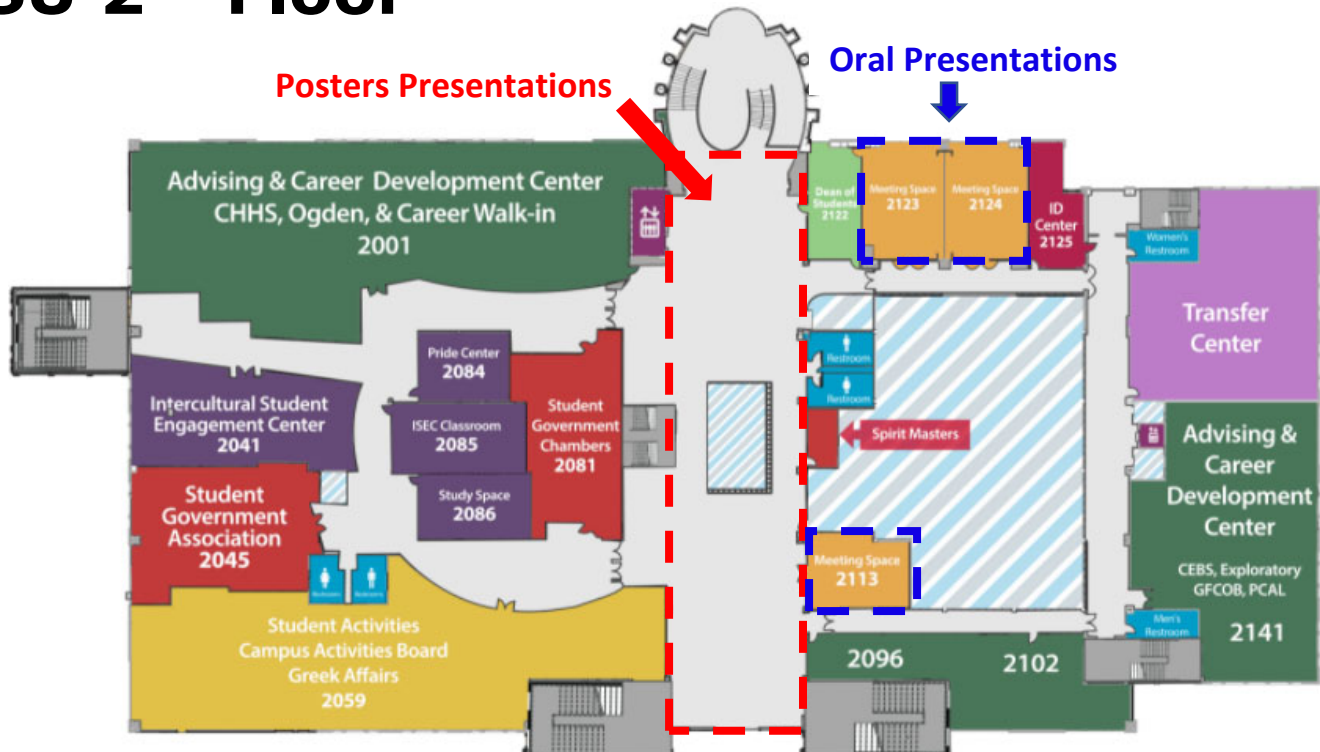
- Oral Papers and Performances in Rooms 2113, 2123, 2124, and 3003 – 3007
- Posters in Second Floor Atrium
 - Presenters should remove their posters at the end of the session

Afternoon Break (3:00 pm – 3:15 pm)

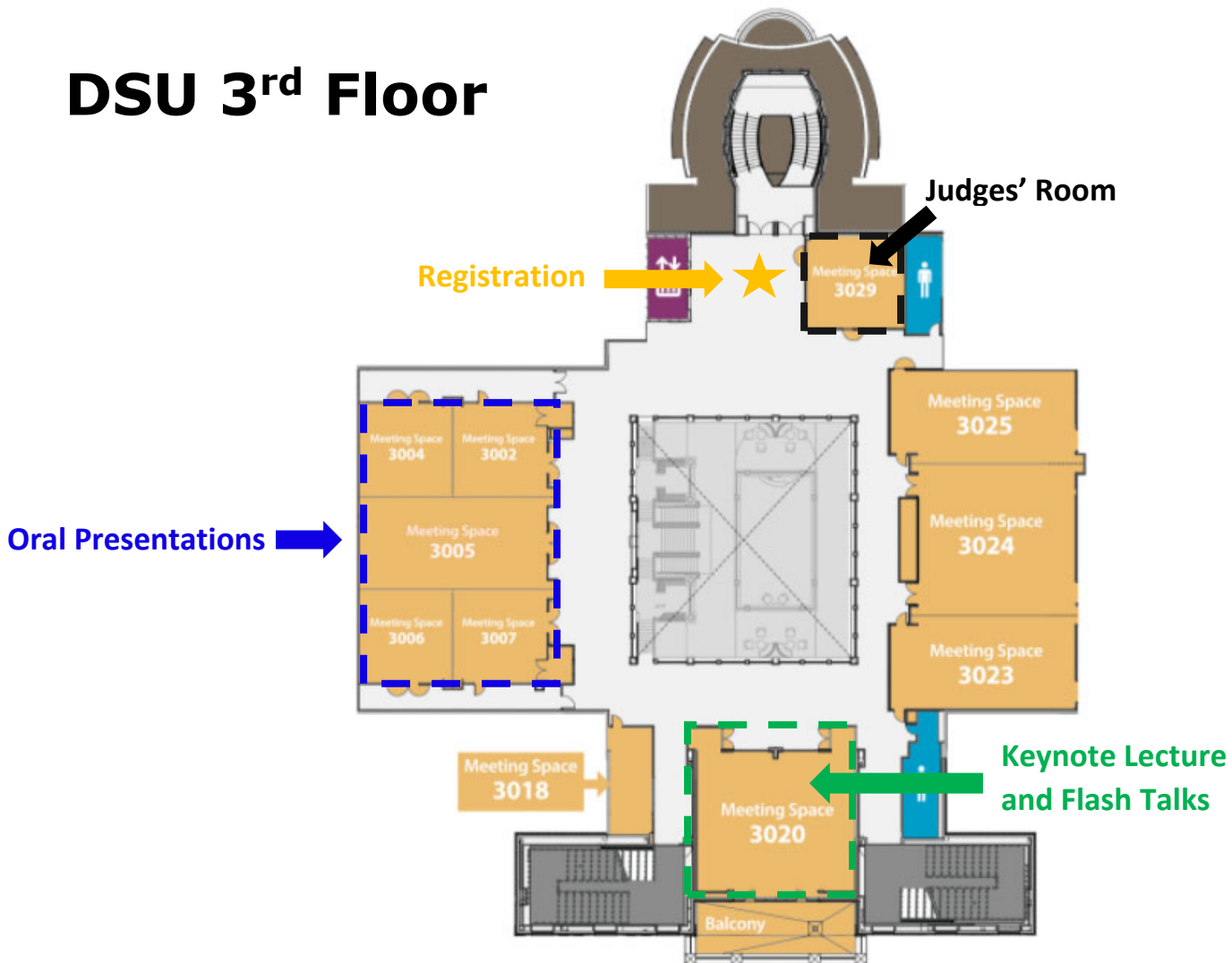
Concurrent Sessions III 3:15 pm – 4:45 pm

- Oral Papers and Performances in Rooms 2113, 2123, 2124, and 3003 – 3007
- Posters in Second Floor Atrium
 - Presenters should remove their posters at the end of the session

DSU 2nd Floor



DSU 3rd Floor



Keynote Speaker and Lecture



Dr. Farhad Ashrafzadeh

"Research as a Self-Discovery Process: Identifying and Fostering Your Inner Talents"

8:30 – 9:30 am

DSU 3020

Dr. Farhad Ashrafzadeh is a professor of electrical engineering, the Greulich Chair of Energy Systems, and the founding director of the Center for Energy Systems at WKU. He is an internationally recognized researcher in the field with over 70 granted patents. He has more than 25 years of industry and academic experience in the conceptualization, development, and commercialization of new products and products' functions and features.

Dr. Ashrafzadeh founded the Research Center for Energy Systems at WKU in 2018, which has brought more than *\$2M research funds* to WKU from leading global companies such as *Samsung, Tempur-Sealy International, and Black and Decker Inc.* The Center has engaged more than 110 undergraduate students in developing new products and real-world problem-solving. The Center has become a true engine for *workforce development* in technology for Southern Kentucky and beyond.

Dr. Ashrafzadeh received the prestigious "*University Award on Innovation and Impact on Outstanding Corporate-Sponsored Research*" in 2018, the "*WKU One-Million Dollars Grant Club Award*" in 2019, and the "*WKU Faculty Award in Research and Creativity*," -- the highest research award at the university in 2020, and the *Ogden College Teaching Award* in 2015. Dr. Ashrafzadeh was the *Keynote Speaker* for the "IEEE International Electrical Machines and Drives Conference" San Antonio, Texas, a former associate editor for the *IEEE Transaction on Industrial Electronics*. He is a certified Six-Sigma Black-Belt Engineer.

In this talk, Dr. Ashrafzadeh will share his research and education philosophy for the student-driven research at the WKU Center for Energy Systems with some real examples. Defining the research objective with its end goals and allowing students to explore and identify their own solutions enable them to discover and foster their hidden talents which is one of the ultimate goals of education. This student-empowerment approach puts *students at the center of education* to discover their own passion and inner talents, shaping their future professional and personal lives.

Conference History

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 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.

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 Annual Student Research Conference is a major university-wide event of REACH.

Conference Highlights

The 52nd Annual WKU Student Research Conference proudly showcases 193 research projects and creative works. There are 109 posters and exhibits, 79 oral papers and five performances.

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 39 schools, departments, programs, and institutes representing all colleges.

1. Agriculture
2. Art
3. Astrophysics
4. Biochemistry
5. Biology
6. Business Sciences
7. Chemistry
8. Communication
9. Communication Sciences and Disorders
10. Computer Information Systems
11. Computer Information Technology
12. Counseling and Student Affairs
13. Economics
14. Engineering and Applied Sciences
15. English
16. Family and Consumer Sciences
17. Finance
18. Folk Studies and Anthropology
19. Geography and Geology
20. Health Sciences
21. History
22. Interdisciplinary Studies
23. Journalism and Broadcasting
24. Kinesiology, Recreation and Sport
25. Mathematics
26. Music
27. Philosophy and Religion
28. Physical Therapy
29. Teacher Education
30. Physics and Astronomy
31. Political Science
32. Psychological Sciences
33. Psychology
34. Public Health
35. Social Work
36. Sociology
37. Special Instructional Programs
38. Teacher Education
39. Theatre and Dance

Conference Organization and Session Winners

The research and creative projects presented at the conference are organized into graduate sessions and undergraduate sessions with five to six students per session. Students are grouped into sessions based on the subject areas of their projects: natural sciences, social sciences and education, health and human services, arts and humanities, business, and interdisciplinary studies.

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 via their mentors, and all student presenters will receive judges' feedback via their mentors after the conference.

Acknowledgments

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. We commend the mentors for their support of scholarly activities and for their assistance in preparing students for the conference.

Funding for the 52nd 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. Laura Burchfield and Rynne 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, Corie Morell-Martin, 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, Rodney King, Jason Polk, and Ranjit Koodali delivered informative professional development workshops for students in preparation of the conference.

The Downing Student Union staff at WKU provided logistical support for the conference. WKU Dining prepared lunch in the Fresh Food Company, and WKU Catering provided refreshment support in our judges' deliberation room.

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 2021-2022 are Ranjit Koodali, Lawrence Hill (chair), Simran Banga, Tim Thornberry, Christopher Biolsi, Timothy Rich, Leah Thompson, Dan Forrest, Laura Burchfield, Sam Earls, Kayla Baker, Alexis Alexis Courtenay and Ozkan Ozer. Felicia McCroskey, a WKU senior worked with the Council as a social media coordinator. 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 event.

Listed below are the 86 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.

Shahnaz	Aly	Thomas	Gross	Will	Perry
Darlene	Applegate	Lance	Hahn	Chris	Peters
Les	Archer	Kirolos	Haleem	Alex	Poole
Farhad	Ashrafzadeh	Tony	Harkins	Eric	Rappin
Jacqueline	Basham	Jean-Luc	Houle	Mark	Schafer
Gordon	Baylis	Katherine	Howell	Nilesh	Sharma
Leslie	Baylis	Trish	Jaggers	Vickie	Shoumake
Mark	Berry	Patricia	Kambesis	Luiz	Silva
Brent	Bjorkman	Molly	Kerby	Autumn	Singer
Lauren	Bland	Jae	Kim	Michael	Smith
Amy	Brausch	Soyeon	Kim	Tannaz	Soltani
Shea	Brgoch	Cheryl	Kirby-Stokes	Trini	Stickle
David	Brown	Amelia	Kolb	Whitney	Stone
Katrina	Burch	Kimberly	Kolb	Derick	Strode
Jenny	Burton	David	Lee	Danilo	Tolusso
Joel	Chapman	O. E.	Mansour	Matthew	VanSchenk
Manohar	Chidurala	Brittany	Martin	Markus	vonSteinf
Xiuhua	Ding	Michael	May	Huanjing	Wang
Gihan	Edirisinghe	Mark	McAndrews	Carol	Watwood
Hannah	Elliott	Leanna	Miller	Adam	West
Xingang	Fan	Wren	Mills	Aaron	Wichman
Yuan	Fang	Kevin	Modlin	Samantha	Williams
Ann	Ferrell	Mohsen	Mollagholamali	Audie	Wood
Nicholas	Fortune	Yaser	Mowafi	Kaylee	Woodard
Christine	Foster	Robert	Neidlinger	Matt	Woodward
Nahid	Gani	Van Thuan	Nguyen		
Ashley	Garrett	Beth	Norris		
Jacqueline	Gibbons	Morteza	Nurchesmeh		
Sherrie	Godbey	Soyoung	Park		

Oral Presentations and Performances

Concurrent Sessions I (10:30 am – 12:00 pm)

Session 1 - Special Organized Session, "Applicable Applied Mathematics."					
Room 2113	Special Session Organizer and Moderator	Judge2	Judge3		
	Ozkan Ozer	Yaser Mowafi	Shahnaz Aly		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
10:30 AM	Avoiding Sensor Data Filtering By The Finite-difference Approximations Of A Three-layer Beam	Ahmet	Aydin	Ahmet Ozkan	Ozer
10:45 AM	Boundary Sensor Design Leading To The Exponential Stability Of Piezoelectric Beam Vibrations	Md Rafi As	Sadeq Ibn Emran	Ahmet Ozkan	Ozer
11:00 AM	A Thorough Mathematical Investigation Of The Point-feedback Stabilization Of Piezoelectric Smart Beams	Alexandra	Driehaus	Ahmet Ozkan	Ozer
11:15 AM	Numeric Filtering Vs. Non-filtering: Boundary Control Of Vibrations On A String	Logan	Stewart	Ahmet Ozkan	Ozer
11:30 AM	The Uniform Observability Of Filtered Approximations For Three-layer Beam	Ahmet	Aydin	Ahmet Ozkan	Ozer
11:45 AM	Development of Automated Scent Classification using Gas Chromatography	Alexandra	Driehaus	Ivan	Novikov

Session 2 - Graduate Oral Presentations					
Room 2123	Judge1	Judge2	Judge3	Judge4	
	Jenny Burton	Whitley Stone	Adam West	Jean-Luc Houle	
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
10:30 AM	Attitudes Toward Diversity Initiatives	Kennedy	Hammonds	Katrina	Burch
10:45 AM	An Investigation Of Perceived Authenticity Of Diversity And Black Lives Matter Statements And Their Influence On Applicant Attractiveness	Shelby	Davis	Katrina	Burch
11:00 AM	Applying The Circumplex Model To The Examination Of Job Stress	Emily	Andrulonis	Katrina	Burch
11:15 AM	Queer Identity As Agency And Resistance	Sylas	Baldwin	Tim	Frandy
11:30 AM	Gender, Community And Interpersonal Relationships In The Professional Body Piercing Industry	Kathryn	Novak	Tim	Frandy

Session 3 - Graduate Oral Presentations					
Room 2124	Judge1	Judge2	Judge3		
		Mohsen Mollagholamali	Soyeon Kim	Van Thuan Nguyen	
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
10:30 AM	Unification Through [dis]identification: A Rhetorical Analysis Of A Student-run Newspaper's Organizational Identification Strategies	Julie	Sisler	Angie	Jerome
10:45 AM	Coronavirus Anxiety Among University Students	Haley	Elliott	Lester	Archer
11:00 AM	Nonprofit Accountability: Effects of Subsector on Online Accountability	Fatin	Yaro	Nicolas	Brake
11:15 AM	Rotary And Rivers: Saving Our Rivers Through Service Learning In Riverside Communities Via Riverboat Based Education And Outreach	Trevor	Harry	Jason	Polk
Session 4 - Graduate Oral Presentations					
Room 3003	Judge1	Judge2	Judge3	Judge4	
		Brent Bjorkman	Aaron Wichman		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
10:30 AM	Molecular Phylogenetics And Biogeography Of North American Spider Beetles	Robert	Chambliss	Keith	Philips
10:45 AM	Histone Acetyltransferase Activity of Legionella pneumophila LneB Protein in Treated Macrophage.	Kayode	Adeyemi	Simran	Banga
11:00 AM	Functional Analysis Of Ravq, A Legionella Pneumophila Effector Protein	Shreya	Neupane	Simran	Banga
11:15 AM	Identification Of Toxic Genes From Mycobacteriophage Moomoo	Whitney	Heard	Rodney	King
11:30 AM	Weight Gain Variance From Glucocorticoids And Sleep Fragmentation In Male Mice	Christian	Chelson	Noah	Ashley
11:45 AM	Effects of Glucocorticoids upon Pro-Inflammatory Responses in the Brain to Acute Sleep Fragmentation	Hunter	Weaver	Noah	Ashley

Session 5 - Graduate Oral Presentations					
Room 3005	Judge1	Judge2	Judge3		
	Matt Woodward	OE Mansour	Sherrie Godbey		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
10:30 AM	A Predictive Flood Model For Urban Karst Environments	Trayson	Lawler	Jason	Polk
10:45 AM	Inferring Tectonic Signals Using River Longitudinal Profile Models And Geomorphic Proxies At The Fold And Thrust Belt, Eastern Himalayan Range, Bengal Basin	Niroj	Shrestha	Nahid	Gani
11:00 AM	Examining Hydrogeological Dynamics Of Baselevel And Reverse Flow Of The Green River And Major Springs Of Mammoth Cave, Kentucky	Matthew	Cecil	Jason	Polk
11:15 AM	Improving Best Management Practices For The Siting, Maintenance, And Design Of Urban Karst Groundwater Injection Wells	Abigail	Williams	Jason	Polk
11:30 AM	Consequences Of Climate Change In North American Cave Fauna	A. S.	Apostolopoulos	Keith	Philips
Session 6 - Graduate Oral Presentations					
Room 3007	Judge1	Judge2	Judge3		
	Huanjing Wang	Wren Mills			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
10:30 AM	Coating biomedical implants with a CaP to resolve metal corrosion and toxic ion release problems	Salizhan	Kylychbekov	Ali Oguz	Er
10:45 AM	Evaluation Of Antibacterial Activity Of Pulsed Laser Synthesized Silver Nanoparticles Combined With Methylene Blue For Photodynamic Therapy Application	Somon	Hakimov	Ali	Oguz Er
11:00 AM	Magnetically enhanced shockwave-assisted 3-dimensional imprinting on NiTi Shape Memory Alloy applications	Zikrulloh	Khuzhakulov	Ali Oguz	Er
11:15 AM	K-means Clustering Using Gravitation As Distance Measure	Ajinkya Vishwas	Indulkar	Qi	Li
11:30 AM	Understanding The Meteorology Behind The December 11, 2021 Bowling Green, Ky Tornadoes	John	Bowen	Josh	Durkee
11:45 AM	Liquid Chromatography With Tandem Mass Spectrometry Method Development For	Symone	Whalin	Eric	Conte

The Determination Of β -defensins In Bovine Milk				
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Oral Presentations and Performances Concurrent Sessions II (1:30 pm – 3:00 pm)

Session 7 - Undergraduate Oral Presentations					
Room 2113	Judge1	Judge2	Judge3		
	Soyoung Park	Kevin Modlin	Brittany Martin		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
1:30 PM	Finances, Mental Health, And Bad Singing: Openness Vs. Closedness Dialectic In Romantic Relationships During The Covid-19 Pandemic	Mary	Pitts	Blair	Thompson
1:45 PM	Cinemanarrative Dissonance in The Conformist	Jackson	Powers	Ted	Hovet
2:00 PM	Using Grammaticalization to Create a Fictional Language	Catherine	Sheffield	Trini	Stickle
2:15 PM	A Critical Biography of John Algeo: From Historical Linguist to Dialectologist	Lindy	Sipes	Trini	Stickle
2:30 PM	Will The Real News Reporters Please Stand Up?: A Study Of Bias In The Media	Hannah	Claussen	Mac	McKerral
2:45 PM	Chinese Use Of Shaming Language On The Topic Of Covid-19 In The Sino-American Relationship	Miriam	Dawson	Ashley	Stinnett
Session 8 - Undergraduate Oral Presentations					
Room 2123	Judge1	Judge2	Judge3		
	Les Archer	Amy Brausch			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
1:30 PM	Kentuckians' Perception Of The Environment And Use Of Public Outdoor Space	Hannah	Herrmann	Leslie	North
1:45 PM	Inquiry Based Learning & Its Impact On Student Perspectives	Shelby	Robertson	Natalie	Mountjoy
2:00 PM	Examining Student Resource Officer Use Related To Minority Students	Assumpta	Okocha	Thomas	Gross
2:15 PM	An empirical study on feature selection for prediction of online shopping purchases.	Henry	Helmerts	Huanjing	Wang
2:30 PM	Safety Investigation Of Driver Behavior At Work Zones In Kentucky: A Driving Simulator Study	Nicholas	Abshire	Kirolos	Haleem
2:45 PM	White House Community Center Abstract	Jonathan	Bryant	Shahnaz	Aly

Session 9 - Undergraduate Oral Presentations					
Room 2124	Judge1	Judge2	Judge3		
	Nicholas Fortune	Ann Ferrell	Morteza Nurcheshmeh		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
1:30 PM	Decomposition Rates Of Rye, Crimson Clover, And Mixed Rye-clover Cover Crops In A Kentucky Corn Field	Alastair	Flowers	Becky	Gilfillen
1:45 PM	Uav Cave Mapping And Vr Experience-Hardware	Nicholas	Clayton	Jeffrey	Galloway
2:00 PM	The Use Of Unmanned Aircraft Systems, Meteorological Forensics, And Engineering To Estimate December 11, 2021 Tornado Strength In Bowling Green, Ky.	Jacob	Disinger	Josh	Durkee
2:15 PM	Investigating Motorcycle Safety In Kentucky Using Machine And Deep Learning Techniques	Eric	Xing	Kirolos	Haleem
2:30 PM	Development Of Collaborative Robotics To Assist Healthcare Staff And Facilities	Albert	Kilgore	Farhad	Ashrafzadeh
2:45 PM	Utilizing GIS to link research and land management: A case study of the Green River Nature Preserve	Jack	Mayo	Pat	Kambesis
Session 10 - Undergraduate Oral Presentations					
Room 3003	Judge1	Judge2	Judge3		
	Thomas Gross	Will Perry	Kirolos Haleem		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
1:30 PM	Hurricanes In Relation To Precipitation Levels	Adianne	Velders	Xingang	Fan
1:45 PM	New Analysis Of Cold Clouds In Perseus Spiral Arm	Isaiah	Beauchamp	Steven	Gibson
2:00 PM	Satellite And Radar Analysis Of The May 9, 2016, Katie/wynnewood Ef-4 Tornado	Michael	Quire	Joshua	Durkee
2:15 PM	Hurricane Irma (2017) Analysis During Initialization, Intensification, And Decay Using Satellite And Radar Data	Jeffery	Wood	Joshua	Durkee
2:30 PM	Determination Of Weld Sectional Properties: Classical Techniques Vs. Digital Cad Tools	Madeline	Bunnell	Joel	Lenoir
2:45 PM	Design And Development Of Pitot-static Tubes For External Flow Pressure Measurements During Wind Tunnel Testing	Matthew	Clouse	Manohar	Chidurala

Oral Presentations and Performances Concurrent Sessions III (3:15 pm – 4:45 pm)

Session 11 - Undergraduate Oral Presentations					
Room 2113	Judge1	Judge2			
	Gordon Baylis	David Brown			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
3:15 PM	Polydimethylsiloxane As A Substrate To Enable The Use Of Photocatalysts To Treat Organic Water Pollution	Connor	Schulte	Matthew	Nee
3:30 PM	Synthesis And Kinetic Studies Of High-valent Chromium(v)-oxo Species Supported By A 5,10,15,20-tetramesitylporphyrin	Tristan	Skipworth	Rui	Zhang
3:45 PM	Identifying The Transcription, Translation, And Functionality Of Circular Rnas Using High-throughput Sequencing Data	Andrew	Park	Samuel	Earls
4:00 PM	Tyrosine Kinase Receptors	Dipak	Darbar	Chandrakanth	Emani
Session 12 - Undergraduate Oral Presentations					
Room 2123	Judge1	Judge2			
	Morteza Nurcheshmeh	Kaylee Woodard			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
3:15 PM	2021 Winter Storm Of The Century	Alexis	Rodriguez	Joshua	Durkee
3:30 PM	The Role Of Emergency Management Disaster Science And Its Application To The December 11, 2021, Bowling Green Tornadoes	Casey	Archev	Josh	Durkee
3:45 PM	Elemental Abundances of Planetary Nebulae	Sebastian	Miracle	Ting-Hui	Lee
4:00 PM	Relatedness Within Stonefly Species	Promise	Willhite	Scott	Grubbs
4:15 PM	Aging And Tactile Speed Matching	Maheen	Baig	J. Farley	Norman

Session 13 - Undergraduate Oral Presentations					
Room 2124	Judge1	Judge2			
	Leslie Baylis	Lauren Bland			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
3:15 PM	Molecular Evolution Of The Cancer-related Her2 Gene (erbb-2)	Lauren	Walker	Chandrakanth	Emani
3:30 PM	Molecular Evolution Of The Cancer-related At-rich Interaction Domain 2 Gene (arid2)	Coral	Ghrist	Chandrakanth	Emani
3:45 PM	White Squirrel Weather: Applied Learning Model Utilized During The December 11, 2021 Tornado Emergency And Operations At Wku	Cooper	Bennett	Josh	Durkee
4:00 PM	Photometric Distance To Rx For	William	Brunt	Ting-Hui	Lee
4:15 PM	The Study Of Blazar Variability With The Tess Mission	Ethan	Poore	Michael	Carini
4:30 PM	Measurement Improvement in an Optical Interferometer using Stochastic Resonance	Lars	Hebenstiel	Ivan	Novikov
Session 14 - Undergraduate Oral Presentations					
Room 3003	Judge1	Judge2	Judge3		
	Audie Wood	Katrina Burch	Kevin Modlin		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
3:15 PM	US Public Supports Action on China's Human Rights Abuses: Survey and Publication	Josie	Coyle	Timothy	Rich
3:30 PM	A study exploring the perceptions of Kentucky Family Court Judges and Attorneys regarding the effectiveness of parental involvement in achieving positive permanency for a child	Nathan	Terrell	April	Murphy
3:45 PM	Public Perceptions of Providing Aid to North Korea Among South Koreans	Erika	Puhakka	Timothy	Rich
4:00 PM	Paid Parental Leave and its Effects on Employee Turnover and Wage Replacement Rate	Chetas	Chavda	Lauren	McClain
4:15 PM	Weight of the Matter: Correlations in Access to Parental Leave to Birth Weight and Preterm Births	Kole	Ingram	Lauren	McClain
4:30 PM	Where Health Meets Hackers: Public Policy Recommendations On Medical Cybersecurity Infrastructure	Christian	Butterfield	Timothy	Rich

Session 15 - Undergraduate Performances and Oral Presentations

Room 3005	Judge1	Judge2	Judge3		
	Trish Lindsey Jagers	Jacqueline Gibbons	Will Perry		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
3:15 PM	An Informative Speech Regarding Christianity's Theological Influence On The Social Construction Of Disability: Biblical Stories, Their Modern Impacts, And Implications	Tess	Welch	Ganer	Newman
3:30 PM	Antitype	Faith	Harris	Trini	Stickle
3:45 PM	Finger Snaps and Tilted Hats: A Study of Bob Fosse's Jazz Style	Chaney	Robinson	Amanda	Clark
4:00 PM	Pedagogical Methodologies Through the Lens of Inclusion in Dance	Jaclyn	Schiess	Meghen	McKinley

Oral Posters Concurrent Sessions I (10:30 am – 12:00 pm)

Session 16 - Graduate Poster Presentations (10:30 am - 12 pm)					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Nilesh Sharma	Manohar Chidurala	Alex Poole		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 1	Does Multi-Tasking Impact Anxiety, Cognitive Load, Enjoyment, and Heart Rate?	Gunther	Carpenter	Steven	Winger
Board 2	An Investigation Of Carbon Cycling In An Urban Karst Groundwater System	Amy	Hourigan	Jason	Polk
Board 3	Evaluating Flood Risk, Perception, And Equity In Urban Karst Communities Using An Integrated Gis Assessment Approach	Chloe	Cooper	Jason	Polk
Board 4	A Community Engaged Partnership for Watershed Health Protection and Stormwater Management	Darwin	Harris	Ritchie	Taylor
Board 5	Evaluating the Effects of Reciprocal Peer Coaching on Teachers' Use of Classroom Management Strategies	Kaitlin	Morris	Jessica	Torelli
Board 6	Public Health Implications Of A Food Assistance Program Among Hiv/aids Patients	Emma	Logsdon	William	Mkantaa
Session 17 - Graduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Tannaz Soltani	Xinhua Ding	Molly Beth Kerby		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 7	Do Changes In Navy Fitness Testing Protocols Impact Service Member Performace?	Alison	Colao	Rachel	Tinius
Board 8	The Validity Of Perceptual Recovery Status On Monitoring Recovery During A High-intensity Back Squat Session	Nicholas	Buoncristiani	Dano	Tolusso
Board 9	The Validity Of The Repetitions In Reserve Based Rating Of Perceived Exertion Scale In Single Joint Exercise	Grant	Malone	Whitley	Stone
Board 10	Do People Overestimate The Number Of People In Their Political Party That Support Their Policy Preferences?	Dalton	Bailey	Aaron	Wichman
Board 11	Sleep Quantity Moderates The Effects Of Cannabis Use And Cannabis-related Problems	Katie	Moskal	Jenni	Teeters
Board 12	Lifetime Cannabis Use Is Associated With Suicidal Ideation And Non-suicidal Self Injury	Diamonde	McCollum	Jenni	Teeters

Session 18 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Xingang Fan	Autumn Singer	Gihan Edirisinghe		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 13	Effect of collagen concentration on meat emulsion stability and product quality	Kentaro	Kawata	Luiz	Silva
Board 14	The Connection Of Stem And Art & Design: A Visual Study Of The Importance Of Digital Arts In The Traditional Gallery Space	Sarah	Terry	Mark	Simpson
Board 15	Using Hand Tracking For Physically-based Interactions In A Virtual Environment	Zachary	Mers	Kristina	Arnold
Board 16	Discovery and Analysis of Mycobacteriophage Viridity	Drake	Calhoon	Rodney	King
Board 17	Genfind - Predicting Mycobacteriophage Gene Start Sites Using Artificial Intelligence	Sarisha	Lohano	Claire	Rinehart
Board 18	Determining Functions of Genes in Mycobacteriophage MooMoo	Bella	Norman	Rodney	King
Session 19 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Cheryl Kirby-Stokes	Eric Rappin	Markus von Steinfort		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 19	The Genomic Discovery and Analysis of Mycobacteriophages Aquila and Syrinx	Divya	Naidugari	Rodney	King
Board 20	The developmental effects of a V-Type ATPase down regulation in Drosophila melanogaster	Christina	Tran	Ajay	Srivastava
Board 21	Comparison Of Effects Of Sleep Fragmentation On Pro-inflammatory Cytokines Of Male And Female Mice	Manzar	Rzayeva	Noah	Ashley
Board 22	Effects Of Glucocorticoids Upon Pro-inflammatory Responses In Peripheral Tissues To Acute Sleep Fragmentation In Mice	Kimberly	Turner	Noah	Ashley
Board 23	An Analysis Of Bacteriophage Sunflower1121	Lee	Monroe	Rodney	King
Board 24	A Survey of WD40 Containing Genes in Drosophila melanogaster	Brennan	McElfresh	Ajay	Srivastava

Session 20 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Luiz Silva	Michael Smith	Derick Strode		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 25	Behavioral Phenotyping Of Sleep Patterns In Arctic-breeding Birds	Andrea	Diaz Buezo	Noah	Ashley
Board 26	Effects Of Melatonin Implantation On The Activity Levels Of Captive Snow Buntings (Plectrophenax Nivalis)	Zoe	Ward	Noah	Ashley
Board 27	Changes In The Zooplankton Community In Barren River Lake (South Central KY) Between 2008 And 2020	Laurel	Philpott	Philip	Lienesch
Board 28	The Isolation And Characterization Of Bacteriophage Hasitha	Gillian	Brown	Rodney	King
Board 29	Seed Herbivory by Small Mammals on Plants of Conservation Concern in Western Kentucky	Adam	Miles	Michael	Stokes
Board 30	Genome Engineering Of Bacteriophage Moomoo	Sahil	Chhabra	Rodney	King
Session 21 - Graduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Farhad Ashrafzadeh	Nahid Gani	Mark Berry		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 31	Inflammatory Response To Sleep Fragmentation In Skeletal, Cardiac, And Smooth Muscle Tissues In Female Mice	Patton	Allen	Noah	Ashley
Board 32	The Protective Role Of Melanin In Peocilia Latipinna Inner Ear	Gabriel	Heckerman	Michael	Smith
Board 33	Molecular Evolution Of The Cancer-related Parafibromin (cdc73)	Joaquin Santiago	Pauig	Chandrakanth	Emani
Board 34	The Discovery and Sequencing of Bacteriophage	Zoe	Cole	Naomi	Rowland
Board 35	An Analysis Of The Patient Coordinator Program To Close Patient Care Gaps At The Bowling Green Medical Center	Madeline	Skau	Natalie	Mountjoy
Board 36	Molecular Evolution Of The Cancer-related Tyrosine Kinase ABL1 Gene (ABL1)	Chezney	Boothe	Chandrakanth	Emani

Posters Concurrent Sessions II (1:30 pm – 3:00 pm)

Session 22 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Michael May	Robert Neidlinger			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 1	Genetic Analysis Of Cathepsin L In Drosophila Melanogaster Wing Development	Lindsey	Fannin	Ajay	Srivastava
Board 2	Uptake of Cisplatin and Dichloro(ethylenediamine)platinum (II) in Human Embryonic Kidney Cells (HEK 293) and Melanoma cells (SKMEL5)	Allie	Miller	Blairanne	Williams
Board 3	Synthesis And Kinetic Studies Of High-valent Chromium(iv) And Chromium (v)-oxo Species Supported By A Highly Electron-deficient Porphyrin	Mardan	Khashimov	Rui	Zhang
Board 4	Metal-peptide Complex For Carbon Sequestration	Charles	Uland	Bangbo	Yan
Board 5	Synthesis Of Peptide Metal-organic Frameworks Using L-histidyl-l-serine (his-ser) And Zinc Ion	Carolina	Relva	Bangbo	Yan
Board 6	Catalytic Properties Of Heteropolytungstate On Furfural Acetalization	Avery	Lenihan	Bangbo	Yan
Board 7	Antibacterial Effectiveness of Methylene Blue and Silver Nanoparticles on Prosthetic Joint Infections	Briana	Harness	Simran	Banga
Session 23 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Danilo Tolusso	Jae Kim	Gordon Baylis		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 8	Effects Of Cisplatin And Dichloro(ethylenediamine) Platinum II In Melanoma Cancer And Fibroblast Cell Lines	Abigail	Lewis	Blairanne	Williams
Board 9	The Role Of Pt(en)cl ₂ In Altering Cellular Iron Transport	Megan	Hall	Blairanne	Williams
Board 10	Polystyrene Beads for Photocatalysis	Kellen	Patterson	Matthew	Nee
Board 11	Optimizing Surfaced Enhanced Raman Spectrometry Substrates Through Analysis Of Uv-visible Absorbance Spectrum	Cristina Isabel	Pauig	Matthew	Nee
Board 12	Promoting A Walk/run Event To Expand Services For Individuals With Disabilities	McKenzie	Rodgers	Leisa	Hutchison
Board 13	Exploring Weather and Climate in Kentucky with Mesonet Observations	Ryan	Thomas	Eric	Rappin

Session 24 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Kimberly Kolb	Shea Brgoch	David Brown		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 14	Salty Shrinkage and climate change-driven aridification: A satellite-based environmental investigation of the Great Salt Lake in Utah	Isabella	Karn	Nahid	Gani
Board 15	Severe Weather Analysis On The 2016 May 24th, Dodge City Kansas Tornado Outbreak With An Emphasis On Satellite And Radar Data	Cassandra	Campbell	Josh	Durkee
Board 16	Nocturnal Surface Inversions As Observed By The Kentucky Mesonet	Susanne	Peake	Eric	Rappin
Board 17	Climate Statistics For Kentucky Based On Mesonet Observations	Brittany	Pekara	Eric	Rappin
Board 18	United Nations Efforts to Understand and Protect the Most Precious Caves and Karst Resources of the Americas	Keegan	Congleton	Christopher	Groves
Board 19	Exploring Laboratory Techniques In Fluorescent Dye Tracing	Katie	Norman	Lee Anne	Bledsoe
Session 25 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2			
	Amelia Kolb	Ashley Garrett			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 20	Distribution Of Sulfur-oxidizing Bacteria And Sulfide Resources In Parker Cave	Kendall	Wheeler	Pat	Kambesis
Board 21	Electing To Take On Risk: How Political Uncertainty Affects The Stock Market	John	Thornhill	Alex	Lebedinsky
Board 22	Designing For All Walks Of Life	Ashley	Reinhard	Shahnaz	Aly
Board 23	San Andres Eco Resort	Andy	Llarena	Shahnaz	Aly
Board 24	Sustainability In Design	Sara	Kerpestein	Shahnaz	Aly
Board 25	The Art Of Revitalization	Kerragan	Mulzer	Shahnaz	Aly

Session 26 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Matthew VanSchenkof	Molly Beth Kerby			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 26	Making A Community Stronger Through Architecture	Brody	Voegerl	Shahnaz	Aly
Board 27	Strategic Design For National Park Facilities	Colton	Hendrick	Shahnaz	Aly
Board 28	New Albany Community Center	Zachary	Heidbreder	Shahnaz	Aly
Board 29	Healing Through Architecture	Mya	Rashada	Shanaz	Aly
Board 30	Future of the Franchise	Analu	Rugerio	Shahnaz	Aly
Board 31	Creating A Fun Explorative Place	Elissa	Beery	Shahnaz	Aly
Session 27 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Trini Stickle	Beth Norris			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 32	Incorporating Period Architecture Into Contemporary Designs	Austin	Harne	Shahnaz	Aly
Board 33	Community Center	Trevor	White	Shahnaz	Aly
Board 34	Islamic Art Into Modern Design	Nasser	Al Mahruqi	Shahnaz	Aly
Board 35	An Experience On The Water	Kody	Timmons	Shahnaz	Aly
Board 36	The Romania Pavilion: A Look At Cultural Education Through Architecture And Tourism	Katherine	Howard	Shahnaz	Aly
Board 37	Classifying Dice Rolls Using Convolutional Neural Networks	Hunter	Wimsatt	Warren	Campbell

Posters Concurrent Sessions III (3:15 pm – 4:45 pm)

Session 28 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Kirolos Haleem	Lance Hahn	Shea Brgoch		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 1	Vibration Mitigation in Top-Loading Washing Machines	Benjamin	Herald	Morteza	Nurcheshmeh
Board 2	Comparison of 3D Scanning Techniques and Photogrammetry Tools	Noah	Burchett	Joel	Lenoir
Board 3	The Louisville Art Complex	John	Harris	Shahnaz	Aly
Board 4	Implementing Virtual Reality Into Footwear Design	Apirada	Chetawatee	J. Michael	Galloway
Board 5	Wku E-sports Complex	Samuel	Munoz	Shahnaz	Aly
Board 6	The Junkanoo Museum	Eugene	Higgs	Shahnaz	Aly
Session 29 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Samantha Williams	Darlene Applegate	David Lee		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 7	Uav Cave Mapping And Vr Experience - Software	Samirah	Salifu	Jeffrey	Galloway
Board 8	Hawaiian Breeze	Jacob	Belcher	Shahnaz	Aly
Board 9	Skating Rink Days: An Oral History Of A Traveling Roller Skating Rink	Lillian	Bradford	Kate	Hudepohl
Board 10	Bridewealth And Dowry In Northern India	Kaitlyn	Cook	Kate	Hudepohl
Board 11	Climate Reconstruction Of Early Iron Age Khoton Lake Through The Use Of Sediment Stratigraphy And Palynological Remains	Xander	Jarvis	Jean-Luc	Houle
Board 12	College-Aged Women and Their Knowledge and Attitudes of Reproductive Health	Maria	Pfeifer	Rachel	Tinius

Session 30 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2			
	Katherine Howell	Patricia Kambesis			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 13	Identifying Immunizations of Infectious Diseases: A Decision Tree Analysis on Flu Shot Vaccinations	Mia	Sword	Lily	Zhuhadar
Board 14	Developing Model For The Predictive Accuracy Of Probability Of Default On Credit Card Debt	Dhruvinkumar	Patel	Lily	Popova Zhuhadar
Board 15	Housing For Western Kentucky University	Trevor	Hampton	Shahnaz	Aly
Board 16	Nature and Preservation	Rhianon	Hussung	Shahnaz	Aly
Board 17	Wolfram Demonstration Projects To Simulate The Control Of Vibrations On A Three-layer Beam	Matthew	Poynter	Ozkan	Ozer
Board 18	Rurality and its effects on prenatal care in southcentral Kentucky	Kylee	Eilers	Neena	Jones, PhD, MSN, RN
Session 31 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Yuan Fang	Joel Chapman	Matthew VanSchenk Hof		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 19	Servant Leadership And Adult Volunteers In The Boy Scouts Of America	Andrew	Koontz	John	Baker
Board 20	Encouraging Little People's Big Questions: An Elementary School Teacher's Guide To Philosophical Inquiry In Decision Making	Morgan	Flanagan	Audrey	Anton
Board 21	Data Exploration and Feature Extraction from Existing AIA and GOES Data on Solar Flares	David	Boils	Gordon	Emslie
Board 22	Water Pollution Detection Using Autonomous Drone Hardware and Software	Sahil	Krishnani	Farhad	Ashrafzadeh
Board 23	Development of neural network architecture for Material Classification	Angelo Matthew	Pimienta	Ivan	Novikov
Board 24	People Are More Certain About Policies Attributed To Their Own Political Party	Elizabeth	Curtis	Aaron	Wichman

Session 32 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2	Judge3		
	Jacqueline Basham	Ashley Garrett	Christopher Peters		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 25	The Utility Of The PTSD Checklist As A Screener Of Trauma Symptomology	Greta	Kreuzer	Matthew	Woodward
Board 26	Differences In Parental & Peer Relationship Quality And Self-preservation For Those With And Without Self-harm History	Caitlin	Gregory	Amy	Brausch
Board 27	Examining Gender Differences In Academia Within A Pandemic: Exploring The Relationship Among Social Comparisons, Emotional Demands, And Just Saying No	Mia	Kendrick	Katrina	Burch
Board 28	Trauma Type Differentially Impacts Alcohol Use Outcomes and Coping Motives Among Emerging Adults	Macy	Steele	Jenni	Teeters
Board 29	Investigating The Difference In Emotion Dysregulation In Alcohol, Cannabis, And Co-use With College Students	Lily	Bergeron	Jenni	Teeters
Session 33 - Undergraduate Poster Presentations					
2nd Floor Atrium	Judge1	Judge2			
	Leanna Miller	Vickie Shoumake			
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 30	Comparing Retrieval Strategies on Long-term Memory	Peyton	Ash	Jenni	Redifer
Board 31	Examining Men's Preferences in Psychotherapy	Armaan	Rai	Frederick	Grieve
Board 32	Comparison Is The Thief Of Joy? The Effects Of Absolute Versus Relative Status On Mental Health Outcomes	Paige	Glass	Qin	Zhao
Board 33	Individual Differences In Neuromyth Beliefs	Bhavya	Vyas	Jenni	Redifer
Board 34	Stress and Performance Theories: A Primer and Synthesis	Reagan	Phelps	Steven	Wininger

Session 34 - Undergraduate Poster Presentations

2nd Floor Atrium	Judge1	Judge2	Judge3		
	Carol Watwood	Robert Neidlinger	Mark McAndrews		
	Abstract Title	First Name	Last Name	Mentor First Name	Mentor Last Name
Board 35	Examining Associations Between Infant Behavioral Inhibition, Cardiac Physiology, And Regulatory Behaviors	Alyssa	Swift	Diane	Lickenbrock
Board 36	Evaluating Effects Of Task Difficulty On Motivation	Haven Gabrielle	Romero	Sungjin	Im
Board 37	Beliefs About Personality Affect Resilience And Interpersonal Relationships	Dawson	Young	Qin	Zhao
Board 38	Understanding The Mental And Emotional Impacts Of Being A Caregiver Of Socially Isolated Residents During The Covid-19 Pandemic In Kentucky	Chloe	Kerrick	Gary	English
Board 39	Students' Perception of Campus Covid-19 Safety Strategies	Shaleena	Millay	Grace	Lartey