


3-23-2013

# 43rd Annual WKU Student Research Conference

Student Research Council, Western Kentucky University  
*Student Research Council, Western Kentucky University*

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## Recommended Citation

Student Research Council, Western Kentucky University, "43rd Annual WKU Student Research Conference" (2013). *Student Research Conference Select Presentations*. Paper 27.  
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# 43<sup>rd</sup> Annual Student Research Conference



**Saturday, March 23, 2013  
Gary A. Ransdell Hall  
Western Kentucky University  
Bowling Green, Kentucky**

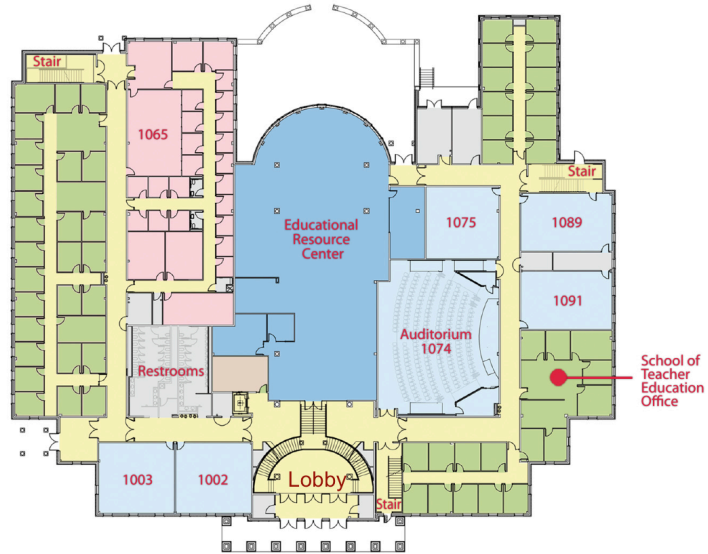


# CONFERENCE SCHEDULE

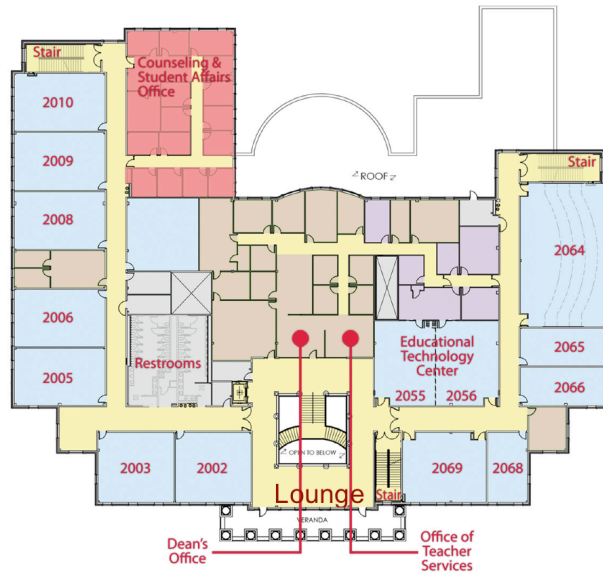
- 7:30-8:30 am**                    **Registration**  
Registration and Information Tables in First Floor Lobby  
Breakfast Buffet in Second Floor Lounge
- 8:30-10:00 am**                **Concurrent Paper Sessions I**  
Rooms 1002, 1003, 1089, 1091, 2002, 2003, 2005, 2006, 2009,  
2010, 3005, 3006
- 10:00-10:15 am**              **Morning Break**  
Information Tables in First Floor Lobby  
Breakfast Buffet in Second Floor Lounge
- 10:15 am-12:00 pm**        **Concurrent Paper Sessions II**  
Rooms 1002, 1003, 1075, 1089, 1091, 2002, 2003, 2005, 2006,  
2009, 2010, 3005
- 12:00-1:00 pm**                **Lunch Break**  
Information Tables in First Floor Lobby  
Lunch Buffet in Second Floor Lounge
- 1:00-2:15 pm**                **Conference Spotlight on Creative Activity and Performance**  
Room 1074  
Remarks by Dr. Darlene Applegate
- 2:15-2:30 pm**                **Afternoon Break**  
Information Tables in First Floor Lobby
- 2:30-4:15 pm**                **Concurrent Poster Sessions**  
Rooms 1002, 1003, 1065, 1089, 1091, 2002, 2003, 2005, 2006,  
2009, 2010, 3005, 3006, 3076
- 4:15-4:30 pm**                **Afternoon Break**  
Refreshments and Information Tables in First Floor Lobby
- 4:30-6:00 pm**                **Sigma Xi Speaker Dr. Paul Simmons and Awards Ceremony**  
Room 1074  
Remarks by Drs. Gordon Baylis and Gordon Emslie
- Judges**                        Register at Student Research Council Table in First Floor Lobby  
Room 1065 Available for Deliberations 9:30 am-1:30 pm  
Room 2069 Available for Deliberations 1:30 pm-4:00 pm

# Gary Ransdell Hall Floor Plan

first floor



second floor



third floor



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**Abstracts are available at [www.wku.edu/studentresearch](http://www.wku.edu/studentresearch)**



WESTERN KENTUCKY UNIVERSITY  
IS AN INSTITUTIONAL MEMBER OF THE  
COUNCIL ON UNDERGRADUATE RESEARCH  
*Learning Through Research*

# INTRODUCTION

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

WKU has a rich history of scholarly engagement of students. Scholarly activity has been defined as 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.

Between 1970 and 2002, the WKU chapter of Sigma Xi, which is an international research society, organized and funded the WKU Student Research Conference. 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 comprised of representatives of each college, the University Honors Program, and Sigma Xi organized the 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 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. This year REACH (Research Experiences and Creative Heights) Week spanned March 18-23 and featured a keynote address by author, humorist, and public radio host Sarah Vowell, as well as research showcases hosted by seven colleges and programs. The conference is the culminating activity of REACH Week.

\* 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](http://www.adec.edu/clemson/papers/weiser.html)

# — CONFERENCE HIGHLIGHTS —

With 318 presentations, the 43<sup>rd</sup> Annual WKU Student Research Conference is, by far, the biggest in the event's history. There are 149 papers, 160 posters/exhibits, and nine spotlight performances. A total of 217 undergraduate students and 101 graduate students are presenters this year. In addition, 56 students are co-primary authors and 126 are secondary authors.

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 42 departments, programs, and institutes in all colleges.

- Agriculture
- Allied Health
- Applied Physics Institute
- Architectural and Manufacturing Sciences
- Art
- Biology
- Business Sciences
- Chemistry
- Communication
- Communication Disorders
- Computer Science
- Diversity and Community Studies
- Economics
- Elementary Education
- Engineering
- English
- Family and Consumer Sciences
- Folk Studies and Anthropology
- Forensics Team
- Gender and Women's Studies
- Geography and Geology
- History
- Information Systems
- Institute for Combustion Science
- Institute for Citizenship and Social Responsibility
- Journalism and Broadcasting
- Kinesiology, Recreation, and Sport
- Leadership Studies
- Mathematics
- Mathematics Education
- Master of Business Administration
- Modern Languages
- Music
- Philosophy and Religion
- Physics and Astronomy
- Political Science
- Popular Culture Studies
- Psychology
- Public Health
- Social Work
- Sociology
- Theatre and Dance

Among the undergraduate participants in the conference are 72 **Honors College** students. Many are presenting their capstone experience/thesis projects at the conference.

Keifer Adkins  
Neha Angal  
Michael Armstrong  
Elizabeth Beilman

Rachel Beyke  
Cherita Black  
Shannon Boone  
James Boys

Kathryn Briggs  
Mariah Callis  
Courtney Cheatwood  
Justin Clark

Amanda Cook  
Charles Coomer  
Aaron Daley  
Logan Eckler  
Adam Edge  
Brandon Farmer  
Mackenzie Farrar  
Shawna Felkins  
Christopher Fields  
Erin Finn  
Elaine Flynn  
Lauren French  
Stephanie Gaiko  
Victoria Gilkison  
Michelle Gilstrap  
Clay Graham  
Stephanie Hagan  
Jessica Hall  
Samantha Hawtrey  
Jonathan Hendrie

Mary Higginson  
Daniel Jackson  
Mia Jaye Jackson  
Alex Jacobs  
Marilyn Kallstrom  
Ashley King  
McKinley Mason  
Kelsey Mattingly  
Ashley McCloughan  
Megan McDonald  
Kristina Medero  
Emily Mesker  
Kendall Miller  
Micaela Montgomery  
Rebecca Morgan  
Brandon Moss  
Blake Neumann  
Amy Ni  
Jordan Olberding  
Jessica Parks

Katherine Paschetto  
Dillon Pender  
Mackenzie Perkins  
Tyler Prochazka  
Robert Rabold  
Andrew Roos  
Jonathan Serpico  
Brenna Sherrill  
Molly Shircliff  
Katryn Steenbergen  
Rachel Sudbeck  
Ramona Sudbeck  
Darren Tinker  
Cynthia Tope  
Dylan Ward  
Celia Whelan  
Molly White  
Sam White  
Alexandra Wright  
Zhibo Yuan

Also among the undergraduate participants are 44 students in the **Carol Martin Gatton Academy of Mathematics and Science in Kentucky**. Since its creation in 2008, a total of 146 Gatton Academy students have presented at the conference.

Corbin Allender  
Grace Babbs  
Garrett Barnes  
David Brown  
Aaron Brzowski  
Lindsey Burke  
Leah Cannady  
Roxanne Coburn  
R. Daulton Cockerell  
Ajit Deshpande  
Samuel Dong  
Matthew Gonzalez  
Ryan Gott  
Hannah Graff  
Adrian Gregory

Anna Hamilton  
William Hawley  
James Hughes  
Will Johnson  
Alex Kearns  
Isaac Kresse  
Nitin Krishna  
Charvinia Neblett  
Patrick Osterhaus  
Jeet Parekh  
Hannah Pennington  
Lindsey Porter  
Madison Preece  
Dorothy Richardson  
Hannah Rodgers

Matt Ruffner  
Nathaniel Serpico  
Lauren Shields  
Mary Spraggs  
William Storrs  
Aaron Tagliaboschi  
Vishnu Tirumala  
Matthew Turner  
Lara van der Heiden  
Connor VanMeter  
Paige Volpenhein  
Gretchen Walch  
Hannah Weber  
Daniel Wei

In 2012 the Office of Academic Affairs and the Office of Research 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 96 undergraduate students have received FUSE grants, 53 of whom are among the conference participants this year. They are identified below with their faculty mentors.

Morgan Armistead (Prof. Shahnaz Aly)	Jonathan Hendrie (Dr. Kevin Williams)
Michael Armstrong (Dr. Rick Grieve)	Jason Howard (Dr. Andrew Wulff)
Benjamin Aroh (Mr. Krist Schell)	Daniel Jackson (Dr. Kevin Williams)
Ariel Beam (Dr. Yan Cao)	Adam Johnson (Dr. Audrey Anton)
Rachel Beyke (Dr. Michael Stokes)	Ashley King (Dr. Raymond Poff)
Cherita Black (Dr. Dana Bradley)	Calvin Logsdon (Dr. Lauren McClain)
Michael Bowlds (Dr. Dick Taylor)	Meagan Luttrell (Dr. Sharon Mutter)
Lindsey Burke (Dr. Elizabeth Lemerise)	Ashley McDade (Dr. Raja Dakshinamurthy)
Samuel Burns (Dr. Joel Lenoir)	Megan McDonald (Ms. Kristy Cartwright)
Alice Byrne (Dr. Hemali Rathnayake)	Ethan Morris (Dr. Glenn LaFantasie)
Matthew Byrne (Dr. Hemali Rathnayake)	Timothy Moye (Dr. Joel Lenoir)
Justin Cave (Mr. Joseph Islas)	Thomas Murray (Dr. Jeremy Maddox)
John Clark (Dr. Michael Stokes)	Jordon Olberding (Dr. Ajay Srivastava)
Amanda Cook (Dr. Lisa Duffin)	Jessica Parks (Dr. Aaron Wichman)
Charles Coomer (Dr. Rodney King)	Dillon Pender (Dr. Raja Dakshinamurthy)
Jordan Cottingham (Dr. Andrew Wulff)	MacKenzie Perkins (Dr. Michael Smith)
Roger Dame (Dr. Chandrakanth Emani)	Michael Powers (Dr. Aaron Celestian)
Samuel Dong (Dr. Phillip Womble)	Jonathan Serpico (Dr. Ivan Novikov)
Logan Eckler (Dr. Matthew Nee)	Varavoot Siriyutwatana (Dr. Raja Dakshinamurthy)
Adam Edge (Dr. Bruce Schulte)	Kaitlyn Snyder (Dr. Andrew Mienaltowski)
Christopher Fields (Dr. Ajay Srivastava)	Allison Steen (Dr. Sharon Mutter)
Elaine Flynn (Dr. Cathleen Webb)	Ronald Strecker (Dr. Nilesh Sharma)
Stephanie Gaiko (Dr. Don Hoover)	Darren Tinker (Dr. Joel Lenoir)
Victoria Gilkison (Dr. Albert Meier)	Paige Volpenhein (Dr. Don Hoover)
Matthew Gonzalez (Dr. Raja Dakshinamurthy)	Molly White (Dr. Rick Grieve)
Caitlin Gover (Dr. Gregory Ellis-Griffith)	Zhibo Yuan (Dr. Rui Zhang)
Justin Hayes (Dr. Robert Choate)	

The Office of Graduate Studies and Research provides grants to graduate students to support creative scholarship that promotes inquiry and contributions to knowledge. Among the graduate student conference participants this year are ten students who received **Graduate Student Research Grant** to support their projects.

Andrew Austin (Dr. Greg Arbuckle)	Goutham Puli (Dr. John Khouryieh)
Gillian Jones (Dr. Ajay Srivastava)	Amanda Seaton (Dr. Rodney King)
Nicholas Lawhon (Dr. Chris Groves)	Julana Smith (Ms. Janice Carter Smith)
Gilman Ouellette (Dr. Jason Polk)	Robyn Wilson (Dr. Sigrid Jacobshagen)
Rammohan Paripelly (Dr. Raja Dakshinamurthy)	Lan Xu (Dr. Hemali Rathnayake)

A total of 151 faculty members served as mentors, providing expert instruction and guidance to our student researchers, artists, and performers. Faculty mentors are indicated in the student spotlight descriptions below and parenthetically on pages 15-34.

# STUDENT SPOTLIGHT

The Student Research Council is pleased to highlight the creative works of undergraduate students from the Forensics Team, Potter College of Arts and Letters, and the College of Education and Behavioral Sciences. The Spotlight on Creative Activity and Performance is scheduled for 1:00-2:15 pm in GRH 1074 and is open to the entire campus community. It is a swipearable event for WKU students.

## Creative Readings

The WKU Forensics Team is the oldest and most successful student organization on campus. Team member **Kristina Medero**, a health science major from Ft. Lauderdale who was a semifinalist at the national competition her freshman year, will present an informative speech entitled “**Flame.**” The piece describes the creation and distribution of Flame, a computer virus with the capabilities to launch a full-scale digital arms race. Drawing comparisons with the Cold War to demonstrate the gravity of the situation, Medero discusses the origins of the virus, its structure and capabilities, and implications for the global community. The director of forensics is Dr. Jace Lux.

Three students from the Department of English will read short works or excerpts from original poems, fiction, and creative non-fiction pieces. **Jarred Johnson** will present his poem “**Geography of a Family.**” Jarred is an English literature major and creative writing minor from Somerset. In Fall 2012 he was selected as one of four students to receive scholarships to the Winter Writing Workshop, where he studied under Gurney Norman and was awarded third place in Sarabande Books Flo Gault Poetry Contest. His faculty mentors are Prof. Mary Ellen Miller and Dr. Tom Hunley.

**Jaclyn Melcher** will read a short scene from her fiction story “**Seeing Mount Rushmore.**” A Louisville resident, Jaclyn is majoring in creative writing and film. She has been a finalist in the Jim Wayne Miller writing contest for two years, most recently placing third. Jaclyn won a scholarship to participate in WKU’s Winter Writing Workshop with Gurney Norman in January. Jaclyn’s faculty mentor is Dr. Molly McCaffrey.

**Rachel Hoge** will read an original nonfiction essay entitled “**Punch Line.**” Hailing from Springfield, Tennessee, Rachel is a junior majoring in creative writing with a minor in Teaching English as a Second Language. Rachel was a finalist in the 2012 Jim Wayne Miller contest, has been published in *Zephyrus*, and is the current intern for the WKU English Majors' Weblog. Her faculty mentor is Dr. Dale Rigby.

## Using Art to Promote Peace in Elementary Aged Students

Louisville junior and elementary education major **Megan McDonald** will display and describe a mural created by the fifth-grade class at Hartstern Elementary School in

Louisville, where she served as an intern. Under Meg's guidance, the 60 students produced a 27 x 12.5 ft mural illustrating what the concept of peace looks like for the Kids' Guernica International Children's Peace Mural Project. The project was featured on several television news programs. Just as peace should travel through the community, the mural is displayed at WKU in March and will be displayed at Kosair Children's Hospital in Louisville in April-May. Her faculty mentor is Ms. Kristy Cartwright.

### **Ensemble and Solo Performances**

Students from the Department of Theatre and Dance will perform an original, one-act play from the department's Spring Ten-Minute Play Festival. The festival is organized by Dr. Michelle Dvoskin. "**Hangman, Sing Me a Song**" is written by playwright **Nathan Gjerstad**, a film major and creative writing minor from Bardstown. The director is **Nick Hudson**, a theatre major and English minor from Bowling Green. The cast includes **Keifer Adkins**, a performing arts-history major from Eubank, as the Hangman; **Joshua San Miguel**, a theatre-political science major from Owensboro, as the Traitor; and **Caleb Pless**, a performing arts major from Brentwood, Tennessee, as the General.

**Erin Finn**, a dance major from Louisville, will present a video of her choreography, "**Full Circle**," and discuss her artistic journey into the challenges and benefits she encountered while creating this dance. Her interest in choreography and anatomy led her to question how to best utilize dancers' differing physical capabilities. A dancer in the WKU dance company, Erin twice participated in the WKU Dance in Italy. She has attended intensive workshops with Alvin Ailey and Complexions Contemporary Ballet. Erin's faculty mentor is Prof. Amanda Clark.

Two student ensembles from the Music Department will perform at the Student Spotlight. The **TrebleMakers** are a women's vocal ensemble coached by Dr. Paul Hondorp. **Lauren French**, a music major from Louisville, is student manager of the group. The TrebleMakers' *a cappella* repertoire includes classics like "Lollipop" and "Danny Boy," as well as recent hits such as "Always Be My Baby." They perform on campus, in community schools and churches, and abroad. Group members are **Kathleen Angerbauer, Hannah Bowman, Hannah Buckley, Emily Curtis, Sarah Fox, Lauren Ganote, Dani Hinton, Caitlin Martin, Katie Morrison, Molly Nance, Dare Norman, Christen Profancik, Becca Roberts, and Rachel Weaver.**

The **Ohm Pauli Quintet** is a scholarship and audition-based ensemble comprised of the top five students within the WKU Symphony. The ensemble was made possible by donations from Mr. Ohm Pauli, a tenured professor in the WKU Music Department for over 25 years. Members of the ensemble are **Anderson Adams, Alyna Bloecher, Josh Bloecher, Clay Burgess, and Hisham Groover.** Dr. Bill Scott coaches the group; his graduate assistant is **Josh Bloecher**, a music/conducting graduate student from Bowling Green. Today's performance is the *Rhapsody on a Theme by Paganini, Op 43. Variation no. 18 Andante cantabile*, composed by Sergei Rachmaninoff.

## CONFERENCE SPEAKER

**Dr. Paul Simmons** is a clinical professor in the School of Medicine at the University of Louisville. He is a medical ethicist who has training in theology and philosophy, doing post-doctoral work at Cambridge and Princeton Universities. Dr. Simmons is involved in national and international debates through speaking and writing on topics such as abortion, genetics, in-vitro fertilization, stem cell research, elective death, and health care. His special interest is in the relation of religion, science, and public policy.



Dr. Simmons brings theological insights into conversation with scientific and legal dimensions of each issue. For example, he examines the relationship between neuroscience and the spirit based on discoveries that religious impulses are related to chemical activity in the brain, raising the intriguing question as to whether people are hard-wired for belief in God. Another area of interest is the teaching of religion in public schools. This movement has ardent proponents but Dr. Simmons contends that it poses enormous problems for the social contract and seems a new threat to social harmony.

The title of Dr. Simmon's presentation is "**Intelligent Design: Is This the End of Evolution?**" Intelligent Design claims to rival or displace the theory of evolution but Simmons argues it is both bad theology and bad science. It has no credible standing as science and appeals to terribly problematic notions such as "irreducible complexity." It also appeals to religious piety as believing the unprovable and improbable. Dr. Simmons believes there are major deficits in Intelligent Design that make it incredible that it would ever be taught in a classroom for science.

Dr. Simmon's presentation is open to the entire campus community and is a swipearable event for WKU students. It is sponsored by the WKU chapter of Sigma Xi.

## AWARDS CEREMONY

WKU faculty and professional staff judge student presentations, performances, posters, and exhibits at the conference. The judges select one winner from each of the 51 sessions listed on pages 15-34 in this program.

**Conference session winners** are announced and acknowledged at the Awards Ceremony in GRH 1074 following Dr. Simmon's Sigma Xi presentation in the late afternoon. All students who presented papers and posters at the conference, as well as family members, friends, faculty mentors, and administrators, are invited to attend. WKU

Vice President for Research Dr. Gordon Baylis and Provost and Vice President for Academic Affairs Dr. Gordon Emslie will make remarks and recognize the session winners.

## — INFORMATION TABLES —

Representatives from a variety of campus offices and organizations are hosting informational tables in the first-floor lobby during the conference. Students are welcome to visit the information tables throughout the day.

**KIIS Study Abroad** is recognized as a leader in international education and is one of the most cost-effective study abroad organizations in the United States. Every summer KIIS provides WKU students over 100 course options in a range of academic disciplines (<http://www.kiis.org/go/COURSES.php>) in 27 programs in Europe, Africa, Asia, Canada, and Latin America. KIIS programs are faculty-led and all course credit is issued by WKU. Undergraduate, graduate, honors, and non-degree seeking students are welcome to apply. WKU faculty are invited to teach abroad with KIIS. Visit [www.kiis.org](http://www.kiis.org) for scholarship, application, and program information. **Contact** Dr. John Dizgun in Tate Page Hall 129 or at [kiis@wku.edu](mailto:kiis@wku.edu) or 270-745-4416.

The **Office of Graduate Studies and Research** is pleased to support graduate student research through competitive grants and travel awards. Graduate study at WKU is an excellent route to continued academic and career success. For more information on graduate program opportunities at WKU, please be sure to stop by our table. **Contact** Crissy Priddy at [crissy.priddy@wku.edu](mailto:crissy.priddy@wku.edu).

**Sigma Xi**, a national scientific research society of scientists and engineers, is an honor society 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. Stop by the Sigma Xi table to learn more about joining and the various programs the society offers. **Contact** Dr. Ajay Srivastava at [ajay.srivastava@wku.edu](mailto:ajay.srivastava@wku.edu).

The intellectual environment of the **Honors College** at WKU is comparable to a smaller, liberal arts institution with the undergraduate resources of a mid- to large-size public university. The Honors in the Major program may be of particular interest to current students wishing to apply to Honors with a higher number of credit hours. Applications are available online for Fall 2013 at [www.wku.edu/honors](http://www.wku.edu/honors). **Contact** Honors Admission Counselor Allison Smith at [allison.smith@wku.edu](mailto:allison.smith@wku.edu) with questions.

The **Office of Scholar Development** (OSD) works with students and their mentors to build research and creative agendas, helps students identify appropriate national and

international scholarship opportunities, and provides intensive writing support throughout the application process. Whether you are looking for funding for a specific project or just curious about potential national and international scholarship opportunities, OSD can help. **Contact** an OSD representative for more information about how to make your big dreams come true. Email [osd@wku.edu](mailto:osd@wku.edu) to schedule an appointment. For information about scholarships and past scholarship recipients, visit [www.wku.edu/osd](http://www.wku.edu/osd).

The WKU **ALIVE Center for Community Partnerships** and the **Institute for Citizenship & Social Responsibility** are seeking graduate assistants for the Hill House program. Hill House is a graduate-level community development and research program at WKU that provides the opportunity for students to live at and work from a house bordering campus on projects that address local issues. If you are considering a graduate program at WKU in the fall and have an interest in learning how you can utilize your academic coursework to create impact in the community of Bowling Green, be sure to stop by our table for more information on this unique opportunity! **Contact** Terry Shoemaker at 270-745-3217 and [terry.shoemaker@wku.edu](mailto:terry.shoemaker@wku.edu)

**TopSCHOLAR®** is a university-wide, centralized digital repository dedicated to scholarly research, creative activity, and other full-text learning resources that merit enduring and archival value, permanent and open access. WKU faculty, staff, and faculty-sponsored students are encouraged to publish in TopSCHOLAR®. The Student Research Conference will have a strong presence in TopSCHOLAR®. Go to [digitalcommons.wku.edu](http://digitalcommons.wku.edu) or just “Google” TopSCHOLAR® to learn more. The TopSCHOLAR information table will be staffed from 10:00 am to 2:00 pm. **Contact** Connie Foster at [connie.foster@wku.edu](mailto:connie.foster@wku.edu)

The **Social Science Research Center (SSRC)** provides an outlet for the conduct of social scientific research, including social surveys, political polls, evaluation research projects, and marketing research projects. The SSRC stimulates collaborations and scholarship among faculty and students from social science disciplines and provides undergraduate and graduate students with research opportunities and experiences that strengthen their employment prospects and graduate school admissions applications. Faculty may use the SSRC facility to conduct their own research or as an educational tool within their research methods courses. Students may use the SSRC facility to collect data for their honors theses and graduate-level research projects. To learn more about volunteer or employment opportunities at the SSRC, how the SSRC can be integrated into undergraduate or graduate level research methods courses, or how the center and its resources may be used to pursue research interests, visit our table between 10:00 am and 2:00 pm. **Contact** Dr. Jerry Daday at [jerry.daday@wku.edu](mailto:jerry.daday@wku.edu) or 270-745-8764.

The **Nondestructive Analysis (NOVA) Center** features a large chamber scanning electron microscope, making WKU the only university in North America with an instrument of this type. The Center is a national focal point for nondestructive measurements and supports the five priority research areas of Kentucky’s new economy strategy,

especially materials and advanced manufacturing. The NOVA Center carries out a number of trans-disciplinary research projects from academia, industry, and national laboratories, primarily across the Southeast U.S. region. For more information about the Center and its capabilities visit <http://www.largechamber.com/>. **Contact** Dr. Edward Kintzel at [edward.kintzel@wku.edu](mailto:edward.kintzel@wku.edu) or 270-745-NOVA (6682).

## ACKNOWLEDGEMENTS

On behalf of the entire campus community, the members of the WKU Student Research Council extend appreciation and congratulations to the hundreds of students who participated 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 meet and overcome challenges, not only distinguishes you from your peers, it serves as an inspiration to others. We are proud of your accomplishments, and you should be, too.

Faculty members who served as mentors to students are identified throughout the conference schedule. We commend the 151 faculty mentors for their support of student scholarly activities and for their assistance in preparing students for the conference.

A total of 104 WKU faculty/staff serving as conference session judges are listed below. We greatly appreciate the support of the judges.

Cathy Abell  
Shahnaz Aly  
Keith Andrew  
Beth Truax Armstrong  
Ferhan Atici  
D'Lee Babb  
Gordon Baylis  
Lauren Bland  
Lorraine Bormann  
Dana Burr Bradley  
Tonya Bragg-Underwood  
Nicole Breazeale  
Catherine Carey  
Joelle Davis Carter  
Wanda G. Chandler  
Ismail Civelek  
Phillip Coleman  
Petra Collyer  
Jerry Daday  
Raja Dakshinamurthy

Tucker Davis  
Carl Dick  
Vladimir Dobrokhoto  
Lisa C. Duffin  
Lacretia Dye  
Amanda Ervin  
Gina Sobrero Evans  
Kari Everett  
Xingang Fan  
Ann K. Ferrell  
Jane Fife  
Matthew Foraker  
Begum Fouzia  
Jim Fulkerson  
Nahid Gani  
Cecile Garmon  
Tim Gott  
Melinda Grimsley-Smith  
Margaret Gripshover  
Chris Groves

Jennifer Hanley  
Tony Harkins  
Gail Hiles  
Cynthia Houston  
Sandra Hughes  
Kumi Ishii  
Joseph Islas  
Lori A. Jaggars  
Trish Lindsey Jaggars  
Muhammad P. Jahan  
Brittney Jones  
John Houryieh  
Jae Kim  
Rachel Kinder  
Thomas Kingery  
Gail Kirby  
Elisabeth Knight  
Alison Langdon  
Laura Leach  
Sonia Lenk

Diane Lickenbrock  
Donielle M. Lovell  
Jeremy B. Maddox  
Nancy Mager  
Sara McCaslin  
Lauren McClain  
Aki Michimi  
Andy Mienaltowski  
Matthew Nee  
Leslie North  
Jane Olmsted  
Anne Onyekwuluje  
Nielsen Pereira  
Tina Peterson  
Nathan Phelps

Chad Phillips  
Jason Polk  
Attila Por  
Thomas J. Reece  
Jeffrey Rice  
Timothy S. Rich  
Tim Ritter  
Jenni Schelble  
Amber Schroeder  
Amanda Seaton  
Cangliang Shen  
Jonghee Shim  
Janice Smith  
Michael Smith  
Lynette Smith

Lee Ann Smith  
Lawrence Snyder  
Roxanne Spencer  
Brandy Tiernan  
Wieb Van Der Meer  
Brimah Vonjo  
Adam R. West  
Andrew West  
Aaron Wichman  
Jennifer Wright  
Di Wu  
Robert Wyatt  
Rong Yang  
Qin Zhao

Funding for the 43<sup>rd</sup> Annual WKU Student Research Conference and other REACH Week activities was provided by the Office of the Provost and Vice President for Academic Affairs, the Office of Research, and the WKU Chapter of Sigma Xi.

The Office of Public Affairs developed electronic advertising, provided photography services for REACH Week events, prepared press releases, and designed the conference artwork. Special thanks to Alicia Carter, Scott French, Tom Meacham, and Tommy Newton. Kevin Willis and WKYU assisted with publicity. English student Seanna Wilhelm prepared a review of Sarah Vowell's *Unfamiliar Fishes* book for the Bowling Green *Daily News*, with assistance from Molly McCaffrey, Lynn Minton, Derick Strode, and Richard Weigel.

Web support was provided by Diana Keeling. Darlene Applegate, Lynn Minton, Emily Nation, Kim Newell, and Ajay Srivastava arranged travel for REACH Week speakers. Jennifer Tougas and staff in the Parking and Transportation Office provided parking maps for REACH Week events.

Honors Toppers, Office of Scholar Development Ambassadors, and Gatton Academy students assisted at the conference and other REACH Week events. Special thanks to Kelsey Mattingly, Audra Jennings, and Derick Strode. Student Government Association donated student prizes for the conference.

The College of Education and Behavioral Sciences Dean's Office provided logistical support for the conference. Special thanks to Sam Evans, Sharon Hartz, and Susan Krisher. The Department of Folk Studies and Anthropology and the Office of the Provost provided additional conference support. Special thanks to Drucilla Belcher, Alessandra Dreyer, Emily Nation, and Renee Pinkston. The Music Department provided music stands for the conference. Special thanks to Mitzi Groom, Eric Poe, and Gary Schallert.



Support for the “Be an Academic Rock Star” student workshop series was provided by the Interactive Video Services Office. Special thanks to Brandon Davidson, Jacob Hamlin, and Tamela Smith. Josh Marble and staff in the Technology Resources Center edited workshop videos.

The WKU Student Research Council organizes the conference. Members represent each college, University Senate, and Student Government Association: Darlene Applegate (Chair), Leslie Baylis, Lance Hahn, Bob Hatfield, Rodney King, Scott Lyons, Ashlee Manley, Andrew Mienaltowski, Lynn Minton, Farley Norman, Merrall Price, Tamera Race, Lawrence Snyder, Ajay Srivastava, and Derick Strode. For more information about the Council, visit [www.wku.edu/studentresearch](http://www.wku.edu/studentresearch).

## **PAPER SESSIONS I**

### **Graduate Paper Session 1: Business**

**Room: GRH 1002**

**Judges: Dr. Amber Schroeder (moderator), Dr. Ismail Civelek, Mr. Tim Ritter**

- 8:30 **April Cavanah, Tiffany Guy, Nick Seymour, Francois Garnier, and Stefan Gavula** Barbara Stewart's Interiors' Business Analysis (Dr. Bob Hatfield)
- 8:45 **Courtney Riffey, William Skaggs, and Abdul Rahima** College Roi (Dr. Bob Hatfield)
- 9:00 **Kyle O'Donnell** Utilizing Energy Saving Performance to Position WKU as a Net-Zero Emissions Campus (Dr. Brian Sullivan)
- 9:15 **Jia Pei, Kyle O'Donnell, Anh Le, Logan Edelen, and Matthew Broreman** The Effect of Different Costing Structures on the Financials of a Distillery (Dr. Bob Hatfield)
- ~~9:30 **Tyler Layton, Kelsea Shultz, Jason Orf, and Tuan Nghiem** BG Area Chamber of Commerce Marketing Tools (Dr. Bob Hatfield) canceled~~

### **Graduate Paper Session 2: Humanities and Interdisciplinary Studies**

**Room: GRH 1003**

**Judges: Dr. Jennifer Hanley (moderator), Dr. Lauren McClain, Ms. Janice Smith**

- 8:30 **Jacqueline Adams** Martha Potter and Women's Kitchen Lives from 1930-1940 (Dr. Kristi Branham)
- 8:45 **Hope Hawkins** Flowers, Knick-Knacks and Patriotism: Assemblage Patterns in Rural Baptist Cemeteries of South Central Kentucky (Dr. Michael Ann Williams)
- 9:00 **Logan Scisco** The Duty of the Rich to Pay and the Poor to Use: Compulsory Education Laws in Gilded Age America (1866-1900) (Dr. Patricia Minter)
- 9:15 **Jacob Stickle** Self-Actualization and Identity Formation on the Appalachian Trail (Dr. Michael Ann Williams)
- 9:30 **Anne McHone** Contrasting Cultures: Islam and Jinn in Kentucky (Dr. Erika Brady)

9:45 **John “Jack” LeSieur** Giving Voice to Objects: Ethnography in the Cultural Resource Management Toolkit (Dr. Michael Ann Williams)

### **Graduate Paper Session 3: Humanities and Interdisciplinary Studies**

**Room: GRH 1089**

**Judges: Dr. Sonia Lenk (moderator), Dr. Jerry Daday, Dr. Lauren Bland**

8:30 **Kaitlyn Markert** Lost But Not Forgotten (Dr. Michael Ann Williams)

8:45 **Leslie Nichols** Connections Through Time in Typewritten Portraits (Dr. Kristi Branham)

9:00 **Lilli Tichinin** Negotiating Gender in the Word of Whitewater Kayaking (Dr. Michael Ann Williams)

9:15 **Susan Farmer** In Defense of Home and Country (Dr. Robert Dietle)

9:30 **Marleda Upton** Taxidermy: From Hunt to Trophy (Dr. Michael Ann Williams)

9:45 **Jacob Buechler** The Highway Is Alive Tonight: The Use of Landscape in U.S. Supernatural Roadway Legends (Dr. Ann Ferrell)

### **Graduate Paper Session 4: Natural Sciences**

**Room: GRH 1091**

**Judges: Dr. Robert Wyatt (moderator), Dr. Tim Gott**

8:30 **Elizabeth Tyrie, Alexandra Bokinsky, Justin Senseney, Julie McEntee, Dzung Pham, and Matthew McAuliffe** Diffusion Tensor Imaging Analysis Using the Medical Image Processing and Visualization (MIPAV) Application (Prof. Leslie North)

8:45 **Yao Xue** Potential Impact of Global Warming on Meeting Chilling Requirements of Perennial Plants Grown in Temperate Regions (Dr. Elmer Gray)

9:00 **Pranav Chandra** Role of Coconut Medium-Chain Fatty Acids in Experimental Colitis (Dr. Nilesh Sharma)

9:15 **Audrey Lama** Distributed Wireless Sensor Network for Detection of Gas Leaks in Pipelines (Dr. Vladimir Dobrokhotov)

9:30 **Lan Xu** Perylenediimide-Functionalized Silsesquioxane Nanostructures for Organic-Based Photovoltaics (Dr. Hemali Rathnayake)

9:45 **Kurt Woods and Farhad Ashrafzadeh** Solar Energy Conversion and Optimal Control Using Organic Photovoltaic (Dr. Farhad Ashrafzadeh)

### **Graduate Paper Session 5: Natural Sciences**

**Room: GRH 2002**

**Judges: Dr. Cangliang Shen (moderator), Prof. Shahnaz Aly**

8:30 **Elizabeth Malloy, Scott Grubbs, and Albert Meier** Trophic Dynamic Interactions in a Temperate River: A Comparison Between High and Lower Karst Flow Reaches (Dr. Scott Grubbs)

- 8:45 **Goutham Puli and Kevin Williams** Synergistic Stabilization of Oil-in-Water Emulsions Containing Mixtures of Xanthan and Locust Bean Gums (Dr. John Khouryieh)
- 9:00 **Dewayne Sowell** Portable Integrated Sensor Unit for Detection of Combustible Gases (Dr. Vladimir Dobrokhotov)
- 9:15 **Linda Baizel** Characterization of the Chesterian Big Clifty Tar Sand from Northern Warren County, Kentucky (Dr. Michael May)
- 9:30 **Tse-Hong Chen and Zhibo Yuan** High-Valent Corrole Metal Complexes (Dr. Rui Zhang)
- 9:45 **Sindhu Monica Dharani Murthy** Simulating Quality Enhancement with Selected Replacement Policies (Dr. David Erbach)

### **Graduate Paper Session 6: Natural Sciences**

**Room: GRH 2003**

**Judges: Dr. Chris Groves (moderator), Dr. Lisa Duffin**

- 8:30 **Gillian Jones and Ajay Srivastava** Understanding the Effects of Lunasin Over-expression on Normal Development and Tumor Progression in *Drosophila melanogaster* (Dr. Ajay Srivastava)
- 8:45 **Kort Butler** The Role of Authigenic Minerals in the Big Clifty Sandstone Oil Reservoir, Northern Warren County, Kentucky (Dr. Michael May)
- 9:00 **Alexander Larin** Intelligent Multi-Functional Artificial Olfactory System (Dr. Vladimir Dobrokhotov)
- 9:15 **Santhosh Kumar Kasulavada and Cathleen Webb** Analysis of Kyrock for Leaching of Impurities in Synthetic Rain Water (Dr. Cathleen Webb)
- 9:30 **Zachary Bessinger** An Automatic Framework for Embryonic Localization Using Edges in a Scale Space (Dr. Qi Li)
- 9:45 **Adam Sondag and Steven Wininger** Self-Determination Theory and Physical Exercise: Examining the Importance of Intrinsic Motivation (Dr. Steven Wininger)

### **Undergraduate Paper Session 1: Humanities**

**Room: GRH 2005**

**Judges: Dr. Jeffrey Rice (moderator), Ms. Sara McCaslin**

- 8:30 **Kyle Marshall** Memory Dictating Memoir: A Dialogue of Generation to Dispel the Mutter (Dr. Dale Rigby)
- 8:45 **Alex Jacobs** You're Tearing Me Apart! (Dr. Anthony Harkins)
- 9:00 **Rebecca Morgan** An Exegesis of Genesis 1:1-2:3 in Light of Ancient Near Eastern Traditions and Modern-Day Science (Dr. Joseph Trafton)
- 9:15 **Joanna Williams** No Country for Clay Men: Examining Black Masculinity and the Move to Violence in Amiri Baraka's 'Dutchman' (Ms. Dawn Winters)
- 9:30 **Haley Cade** Gender in 20<sup>th</sup> Century European Art: The Denial of Traditional Gender Identity Through Ambiguity, Androgyny, and Criticized Gender Roles (Dr. Ingrid Cartwright)
- 9:45 **Fallon Willoughby** Cannibalism Instead of Grace (Dr. Alison Langdon)

### **Undergraduate Paper Session 2: Humanities**

**Room: GRH 2006**

**Judges: Dr. Anthony Harkins (moderator), Ms. Brittney Jones, Dr. Nicole Breazeale**

- 8:30 **Mia Jaye Jackson** Refugee Services in Kentucky: A Case Study of Cedars in Bowling Green, Kentucky (Dr. Kate Hudepohl)
- 8:45 **Jennifer Dyson** Legal Rhetoric and the *Man of Law's Tale* (Dr. Alison Langdon)
- 9:00 **Jordan Kassel** Acceptance Within the LDS Church (Dr. Ingrid Lilly)
- 9:15 **Bradley Englert** Poetry in Faulkner's Prose (Prof. Mary Ellen Miller)
- 9:30 **Ethan Morris** Border State Complexities: Kentucky's Loyalties During the American Civil War (Dr. Glenn LaFantasie)
- 9:45 **Shamika Bowman** Sophocles' Law: Laws and Edicts in *Antigone* (Dr. Nikolai Endres)

### **Undergraduate Paper Session 3: Natural Sciences**

**Room: GRH 2009**

**Judges: Dr. Margaret Gripshover (moderator), Dr. Jeremy B. Maddox**

- 8:30 **Blake Neumann** Traditional Water Harvesting in Desert Fringe Areas of Rajasthan (Dr. John All)
- 8:45 **Daniel Jackson** Molecular Mechanics of Oxaliplatin Derivatives with Their Relevant Biological Targets (Dr. Kevin Williams)
- 9:00 **Morgan Armistead** Dual Approaches to Physical Modeling in the Architectural Design Studio: A Study (Prof. Shahnaz Aly)
- 9:15 **Joshua Slaton, Kevin Schmaltz, Nathan Barzee, Kevin Kappes, and Trey Spargo** Peel the Pup (Dr. Kevin Schmaltz)
- 9:30 **Ronald Strecker** Does TiO<sub>2</sub> Nanoparticle exposure Trigger Inflammatory Responses in Mice? (Dr. Nilesh Sharma)
- 9:45 **Andrew Schuler** Synoptic Overview of December 22-23, 2004 Snowstorm (Dr. Joshua Durkee)

### **Undergraduate Paper Session 4: Natural Sciences**

**Room: GRH 2010**

**Judges: Dr. Amanda Ervin (moderator), Mr. Tucker Davis**

- 8:30 **Michael Powers** Melt Inclusions in Olivine in the Martian Meteorite NWA 5789: Methods, Bulk Composition and Evolution (Dr. Aaron Celestian)
- 8:45 **Patrick Morgan** Morning Star Missionary Baptist Church: An Oasis of Hope (Prof. Shahnaz Aly)
- 9:00 **Gavin Davis** Ability to Reset a Circadian Rhythm Upon Light Pulses By Plant-Like Cryptochrome Knockdown Mutants of *Chlamydomonas reinhardtii* (Dr. Sigrid Jacobshagen)
- 9:15 **Ryan Whitten** Expressing Traditions Through Modernity (Prof. Aly Shahnaz)
- 9:30 **Logan Eckler and Matthew Nee** Molecular Dynamics and Quantum Mechanical Calculations of Aqueous Nitrate Solutions (Dr. Matthew Nee)
- 9:45 **Daniel Wei and Samuel Dong** Development of a Cross-Platform Command Line Based Denial of Service Tool (Dr. Phillip Womble)

### **Undergraduate Paper Session 5: Natural Sciences**

**Room: GRH 3005**

**Judges: Dr. Michael Smith (moderator), Dr. Xingang Fan**

- 8:30 **Luke Musser, William Nalle, Jenna Wilson, and Todd Misener** Workout Tracking Device for the Wellu Program (Dr. Stacy Wilson)
- 8:45 **Brian Urbancic** Analysis of April 25-28, 2011 Outbreak (Dr. Joshua Durkee)
- 9:00 **Daniel Jones** Investigation Into the Design of an Accelerator Drive Reactor (Dr. Phillip Womble)
- 9:15 **Bobby Voyles** Molecular Evolution of MAO-A Gene Across Lifeforms (Dr. Chandrakanth Emani)
- 9:30 **Jonathan Hendrie** Characterization and Reaction of an Analog Anticancer Drug Oxaliplatin (Dr. Kevin Williams)
- 9:45 **Richard Shilts** A Rising Fraternity House (Prof. Shahnaz Aly)

### **Undergraduate Paper Session 6: Natural Sciences**

**Room: GRH 3006**

**Judges: Dr. Nahi Gani (moderator), Dr. Lorraine Bormann**

- 8:30 **Justin Hayes** Determination of Building Envelope and Duct System Integrity Through the Quantification of Air Flow Leakage Rates (Dr. Robert Choate)
- 8:45 **Casey Pearce** Characterization of Mineralogical Composition of Fluorite Ore from Marion, Kentucky (Dr. Andrew Wulff)
- 9:00 **Brandon Farmer and Akhila Bethi** Endothelin-1 Induces Phosphorylation of ERK1/2 in Bovine Corneal Endothelial Cells (Dr. Ken Crawford)
- 9:15 **Michael Campbell** Culminating Old and New (Shahnaz Aly)
- 9:30 **Zhibo Yuan and Tes-hong Chen** Studies of Selective Sulfoxidation Catalyzed by Ruthenium(ii) Carbonyl Porphyrin Complexes with Iodobenzene Diacetate (Dr. Rui Zhang)
- 9:45 **James Boys** Synoptic Analysis of the 14-15 October 2010 New England Nor'easter (Dr. Joshua Durkee)

## **PAPER SESSIONS II**

### **Graduate Paper Session 7: Humanities**

**Room: GRH 1002**

**Judges: Dr. Anne Onyekwuluje (moderator), Ms. Jennifer Wright**

- 10:15 **Samantha Bruer and Thomas Harper** Allen County Log Architecture Survey (Dr. Michael Ann Williams)
- 10:30 **John Bergman, Jr.** Antebellum Kentucky Slave Laws: The Best in the South? (Dr. Selena Sanderfer)
- 10:45 **Jacobe Crowley** Banksy Street Art: Redefining the Context of the Museum and the Everyday (Dr. Timothy Evans)

- 11:00 **Brandi Button** Plain and Simple: The Will to Live Sustainably in an Unsustainable World (Dr. Jane Olmsted)
- 11:15 **Lacey Cornell** Mennonites and the Conventional Health System in Scottsville, Kentucky (Dr. Michael Ann Williams)
- 11:30 **Renee Pinkston, Kimberly Huddleston, and Darlene Applegate** Massey Springs Resort: Archaeological and Vernacular Architecture Investigations of Historic Spring Resort Hotels in Western Kentucky (Dr. Darlene Applegate)

### **Graduate Paper Session 8: Natural Sciences**

**Room: GRH 1003**

**Judges: Dr. Wieb Van Der Meer (moderator), Dr. Thomas Kingery**

- 10:15 **Jesse Evans and Chad Snyder** Synthesis of Rhenium and Manganese Bromo - Pyridazyl Complexes (Dr. Chad Snyder)
- 10:30 **Amanda Seaton and Rodney King** The Left Operon of Bacteriophage HK639 Is Essential for Viral Growth (Dr. Rodney King)
- 10:45 **Gilman Ouellette and Jason Polk** A Multiproxy Reconstruction of Precipitation in the Eastern Caribbean From Cave Deposits in Barbados (Dr. Jason Polk)
- 11:00 **Dan Sandor and Paul Woosley** Cultivar, Mowing Height, and Herbicide Effects on Bermudagrass, *Cynodon dactylon*, Suppression in Tall Fescue, *Schedonorus phoenix* (Dr. Paul Woosley)
- 11:15 **Tori Buckley, Gabrielle Ison, Rammohan Paripelly, and Rajalingam Dakshinamurthy** Expression, Purification and Identification of Fibroblast Growth Factor-1 (Dr. Rajalingam Dakshinamurthy)
- 11:30 **Ahmed Alsalama** A Hybrid Recommendation System Framework Using Association Rules (Dr. Qi Li)

### **Graduate Paper Session 9: Natural Sciences**

**Room: GRH 1089**

**Judges: Dr. Vladimir Dobrokhotov (moderator), Dr. Akihiko Michimi, Dr. Gina Sobrero Evans**

- 10:15 **Robyn Wilson** Temporal Pattern of Trimethylated Lysine 4 on Histone 3 at Rhythmically Active Promoters in *Chlamydomonas reinhardtii* (Dr. Sigrid Jacobshagen)
- 10:30 **Jahi Palmer, Edward Kintzel, Shane Palmquist, and Keith Andrew** Further Investigations of Fibers in the Interfacial Transition Zone of Concrete (Dr. Edward Kintzel)
- 10:45 **Monic Shah and Dillon Pender** Front Line Antibiotic Ceftazidime Gold Nanoparticles: Novel Synthesis and Evaluation of Antimicrobial Activity (Dr. Rajalingam Dakshinamurthy)
- 11:00 **Nicholas Lawhon and Jason Polk** High-Resolution Monitoring of Winter Storm Responses of the Lost River Groundwater Basin, Kentucky (Dr. Chris Groves)
- 11:15 **Jane Bartonjo, Sinilal Bhaskaran, and Sean Wineka** Transformation of *Medicago sativa* for Overexpressing Purple Acid Phosphatase for Removal of Excess Phosphorus from Soil (Dr. Shivendra Sahi)

11:30 **Shawn Smiley, Jitesh Tiwari, Kinchel Doerner, and Claire Rinehart** Genome Annotation and Syntenic Analysis of *Clostridium scatologenes* ATCC 25775 (Drs. Claire Rinehart and Kinchel Doerner)

**Graduate Paper Session 10: Social Sciences/Services**

**Room: GRH 1091**

**Judges: Dr. Kumi Ishii (moderator), Dr. Tina Peterson, Mr. Adam West**

- 10:15 **Angela Byrd** The Sick Role and End Stage Renal Disease (Dr. Jerry Daday)  
10:30 **Ngan Chau** Cultural Differences in the Graduate Classroom (Dr. Jennifer Mize Smith)  
10:45 **Cecelia Satterly, Colleen Wynn, and Lauren McClain** Incarceration and Insecurity: An Examination of Incarceration's Impact on Housing Insecurity for Low-Income Urban Fathers and Children (Dr. Lauren McClain)  
11:00 **Ebo Osam** A Critical Review of Leadership Research: Linear Or Spiral Evolution? (Prof. Sarah Chace)  
11:15 **Ganer Newman, IV** Now Imagine You're One of Them: Using Serious Games to Induce Identification with Out-Groups (Dr. Jennifer Mize Smith)  
11:30 **Colleen Wynn** Out on the Streets: Examining Protective and Risk Factors for Housing Insecurity Among Low-Income Urban Fathers (Dr. Lauren McClain)  
11:45 **Ngan Hoang and Ryan Cummings** The Role of Nonverbal Cues in Forgiveness (Dr. Larry Caillouet)

**Undergraduate Paper Session 7: Humanities**

**Room: GRH 2002**

**Judges: Dr. Cecile Garmon (moderator), Dr. Gail Kirby**

- 10:15 **Michael Bowlds** Radio in Kentucky (Dr. Dick Taylor)  
10:30 **Shawna Felkins** Bones, Frogs, and Killers: The Corporeal Oppression of Women in a Patriarchal, Christian South (Dr. Nikolai Endres)  
10:45 **Lucas Somers** Shays's Rebellion and the Constitution (Dr. Patricia Minter)  
11:00 **Alexander Lane** Encouraging or Affrighting? Understanding Unpardonable Sin in Hawthorne (Dr. Sandra Hughes)  
11:15 **Clay Graham** Madness and Its Relationship to Truth: A Study of Michel Foucault's *The History of Madness* (Dr. Adrian Switzer)  
11:30 **Brenna Sherrill** What's the Buzz? *Jesus Christ Superstar* and Religion in America in the 1970s (Dr. Tony Harkins)  
11:45 **Susan Taylor** *The Prioress's Tale*: A Matter of Redemption (Dr. Alison Langdon)

**Undergraduate Paper Session 8: Humanities**

**Room: GRH 2003**

**Judges: Dr. Qin Zhao (moderator), Dr. Loretta Dye**

- 10:15 **Ann-Blair Thornton** Rhetorically Redefining the Campaign: Barack Obama's Facebook Page (Dr. Jane Fife)  
10:30 **Molly Shircliff** The Rise and Fall of "Chac Mool" (Dr. Sonia Lenk)

- 10:45 **Rachel Sudbeck** What Anonymous Means for the Information Economy (Dr. Sandra Hughes)
- 11:00 **Robert Rabold** Human Rights in the United States Constitutional Doctrine (Dr. Patricia Minter)
- 11:15 **Jessica Najar** *A Visit From the Goon Squad*: A Response to Human Nature (Dr. Kelly Reames)
- 11:30 **Lauren Shields** A Philosophical Inquiry Into the Origins of Truth (Dr. Adrian Switzer)

### **Undergraduate Paper Session 9: Natural Sciences**

**Room: GRH 2005**

**Judges: Dr. Di Wu (moderator), Dr. Rachel Kinder**

- 10:15 **Jessica Hall and Matthew Nee** Analysis of NO and NO<sub>y</sub> Levels in the Lower Atmosphere (Dr. Matthew Nee)
- 10:30 **Jonathan Washington** Waves of Change (Prof. Shahnaz Aly)
- 10:45 **Tara Wagoner** The North American Extratropical Cyclone of October 25-26, 2010 (Dr. Joshua Durkee)
- 11:00 **Jordan Olberding and Ajay Srivastava** Creation of Transgenic UAS-NC1 *Drosophila melanogaster* (Dr. Ajay Srivastava)
- 11:15 **R. Daulton Cockerell** Knot Theory: Embedding Simplification with Local and Global Moves (Dr. Uta Ziegler)
- 11:30 **Trevor Thomas** Gold-Bearing Ores of the Wharf Mine, South Dakota (Dr. Andrew Wulff)
- 11:45 **Jonathon Marques, Derreck Igleheart, and Carlos Ramirez-Leon** Fuzzy Logic Controller (Dr. Farhad Ashrafzadeh)

### **Undergraduate Paper Session 10: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Attila Por (moderator), Prof. Tonya Bragg-Underwood**

- 10:15 **Josh Williams** Studying the Seyfert Galaxy IIZW229.015 with NASA's Kepler Satellite and WKU's Robotically Controlled Telescope (Dr. Michael Carini)
- 10:30 **Eric Isbell** Troubles of Cloud Computing and the Human Factor in Social Engineering (Dr. Rong Yang)
- 10:45 **Heli Shah and Jonathan Washington** Community Nutrition Centre (Prof. Shahnaz Aly)
- 11:00 **Dillon Pender, Lakshmisri Vangala, Vivek Badwaik, Tejas Sangoi, and Rammohan Paripelly** Green Synthesis, Characterization of Starch Gold Nanoparticles, and Its Application for Bacterial Identification (Dr. Raja Dakshinamurthy)
- 11:15 **Jonathan Estes** The Bowling Green Ice Rink: A Study of Architecture and Art (Prof. Shahnaz Aly)
- 11:30 **Evan Crowe and Nahid Gani** Fault Dynamics of the Poorly-Understood Rough Creek Graben, Western Kentucky, in Relation to the New Madrid Seismic Zone (NMSZ) (Dr. Nahid Gani)
- 11:45 **Serpico, Nathaniel** Biodiversity of Western Australian Spider Beetles (Dr. Keith Philips)



### **Undergraduate Paper Session 11: Natural Sciences**

**Room: GRH 2009**

**Judges: Dr. Muhammad Jahan (moderator), Prof. Lori A. Jagers**

- 10:15 **Anthony Bell** WKU Tennis: A Place of Their Own (Prof. Shahnaz Aly)
- 10:30 **Mackenzie Perkins, Michael Smith, Huifang Sun, and Yan Ni** Prophylactic Effects of Growth Hormone (GH) on Zebrafish Auditory Hair Cell Damage (Dr. Michael Smith)
- 10:45 **Garrett Barnes** Ionic Strength and Symmetry-Breaking in Aqueous Nitrate Solutions (Dr. Matthew Nee)
- 11:00 **Jeet Parekh** Perfect Integer Cuboids and Hypercuboids (Dr. Dominic Lanphier)
- 11:15 **Ariel Beam, Swathi Nandala, Pauline Norris, Yan Cao, and Wei-Ping Pan** Solvolysis Production of Liquid Chemicals and Biofuels from Cellulosic Biomass (Dr. Yan Cao)
- 11:30 **Jordan Seng and Rachel Bowles** Ostracode Sieve Pore Morphology: Toward a Reliable Proxy for Paleosalinity in Bahamian Saline Lakes (Dr. Fred Siewers)
- 11:45 **Joshua Smith** Gateway of Rend Lake (Prof. Shanaz Aly)

### **Undergraduate Paper Session 12: Natural Sciences**

**Room: GRH 2010**

**Judges: Dr. John Houryieh (moderator), Dr. Cathy Abell**

- 10:15 **Zachery D. Talton** Depicting Function in Space (Prof. Shahnaz Aly)
- 10:30 **David Brown, Nicholas Wright, and Hemali Rathnayake** Poly(3-Hexylthiophene)-Functionalized Silsesquioxane Nanorods for Organic-Based Solar Cells (Dr. Hemali Rathnayake)
- 10:45 **Ashlan Clark and Gregory Goodrich** Risks of Nocturnal Tornadoes in the Mid-South (Dr. Gregory Goodrich)
- 11:00 **Christopher Fields and Ajay Srivastava** Functional and Expression Analysis of a Novel Basement Membrane Degradator in *Drosophila melanogaster* (Dr. Ajay Srivastava)
- 11:15 **Samuel Dong** Investigation Into SIM Card Security Methods (Dr. Phillip Womble)
- 11:30 **Justin Cave** Applications of Remote Sensing for Hydrocarbon Resource Exploration in the Southern Illinois Basin of Western Kentucky (Mr. Joe Islas)

### **Undergraduate Paper Session 13: Social Sciences/Services**

**Room: GRH 3005**

**Judges: Dr. Jenni Schelble (moderator), Dr. Nielsen Pereira**

- 10:15 **Amanda Cook, Lisa Duffin, Shelby Overstreet, and Martha Day** Motivating WKU Students to Persist in General Chemistry (Dr. Lisa Duffin)
- 10:30 **Calvin Logsdon** Attitudes About Greek Organizations on Western Kentucky University's Campus (Dr. Lauren McClain)
- 10:45 **Luke Aldridge** Investigating Distinct Attentional Patterns in Muscle Dysmorphia Using a Body-Related Dot-Probe Task (Dr. Rick Grieve)

- 11:00 **Megan McDonald** Using Art to Promote Peace in the Lives of Elementary Aged Students (Ms. Kristy Cartwright)
- 11:15 **Michael Armstrong** Fraternity and Sorority Personality and Political Preference Patterns (Dr. Frederick Grieve)
- 11:30 **Neha Angal** Variation in Mandibular Morphology Related to Speech Production in Hominids (Dr. Darlene Applegate)
- 11:45 **Molly White, Frederick Grieve, Ciara Cyr, Luke Aldridge, Bo Armstrong, Juliana Eovino, and Havyn West** Indications of Muscle Dysmorphia From Stroop Test Results (Dr. Frederick Grieve)

**Undergraduate Paper Session 14: Humanities and Interdisciplinary Studies**

**Room: GRH 3006**

**Judges: Dr. Ann Ferrell (moderator), Ms. Gail Hiles**

- 10:15 **Elizabeth Beilman** ‘Pretty Redness in His Lip’: Gender and Sexuality in the Shakespearean Comedy (Dr. Alison Langdon)
- 10:30 **Andrew Roos** Royal Identity and Propaganda of English Monarchs: 1272-1470 (Dr. Beth Plummer)
- 10:45 **Kelsey Mattingly** “Lord Keep Us Safe This Night”: Religious Imagery in Depression-Era Kentucky Quilts (Dr. Guy Jordan)
- 11:00 **Katherine Paschetto** Past in Present: the Interruption of Linear Time in Maus (Dr. Kelly Reames)
- 11:15 **Alexandra Wright** Argentina's Dirty War as Depicted Through Film (Dr. Soleiman Kiasatpour)
- 11:30 **Jacob Parker** Disney's Demons: Culture and Corporation (Dr. Anthony Harkins)

## ———— **POSTER SESSIONS** ————

**Graduate Poster Session 1: Business, Humanities, and Interdisciplinary Studies**

**Room: GRH 1002**

**Judges: Dr. Catherine Carey (moderator), Mr. Brimah Vonjo**

- G01 **Joseph Kimeu** Region-based Athletic Performance: An Insight Into Positional Segregation in Professional Team Sports (Dr. Dennis Wilson)
- G02 **Sumbul Khan** Ethical Standards in Project Management (Dr. Ahmed Khalafallah)
- G03 **Alessandra Dreyer** Secondhand Roses: Narrative Staging at Labold and Sons Salvage, Local Art Gallery and Vintage Boutique (Dr. Timothy Evans)
- G04 **Devin Payne** Louisville Shotgun Houses: An Ethnographic and Vernacular Approach to Contemporary Living Spaces (Dr. Michael Ann Williams)
- G05 **Collin Steiner** Hill House (Mr. Terry Shoemaker)

### **Graduate Poster Session 2: Natural Sciences**

**Room: GRH 1002**

**Judges: Dr. Rong Yang (moderator), Dr. Timothy S. Rich**

- G06 **Oglesby, Jonathan** Every Drop Counts: Visualizing Water Use and Tariffs (Prof. Leslie North)
- G07 **Boateng, Kwasi** Framework for Resource Planning in Complex Projects (Dr. Ahmed Khalafallah)
- G08 **Jason Musser, Keith Andrew, and Phillip Womble** Rapid Cepstral Cyber Threat Identification (Dr. Keith Andrew)
- G09 **Laura Osterhoudt and Kegan McClanahan** Quantifying the Carbon Budget, Upper Green River Watershed, Kentucky (Dr. Jason Polk)
- G10 **Mychal-Drew Moses** Social Media in Project Management? (Dr. Ahmed Khalafallah)
- G11 **Nitin Kumar Pally** Synthesis, Structures of Two Porous Metal-Organic Frameworks Based on Copper and Benzene-1,3,5-Tricarboxylic Acid (Dr. Bangbo Yan)

### **Graduate Poster Session 3: Natural Sciences**

**Room: GRH 1003**

**Judges: Ms. Laura Leach (moderator), Dr. Jane Olmstead**

- G12 **Ning Jin** Effectively Implementing Multiple Projects Management (Dr. Ahmed Khalafallah)
- G13 **Shashidhar Annarapu and Matthew Nee** Custom-Built Raman Spectrometer to Measure Power-Dependent Spectra of Aqueous Nitrate Ion (Dr. Matthew Nee)
- G14 **Veronica Hall** Addressing Water Resource Issues in Barbados From Isotopic and Synoptic Characterization of Precipitation Variability (Dr. Jason Polk)
- G15 **Yaseen Jan** Critical Chain Management (Dr. Ahmed Khalafallah)
- G16 **Yogesh Kherde, Ashley McDade, Varavoot Siriyutwatana, and Dillon Pender** Effects of Various Parameters on Tetracycline Assisted Synthesis of Gold Nanoparticles (Dr. Rajalingam Dakshinamurthy)
- G17 **Edwin Calhoun** Managing Scope Creep with Technology in Project Management (Dr. Ahmed Khalafallah)

### **Graduate Poster Session 4: Social Sciences/Services**

**Room: GRH 1003**

**Judges: Dr. Brandy Tiernan (moderator), Mr. Jim Fulkerson**

- G18 **Anubhuti Shukla** Aphthous Ulcers, a Case Study (Dr. Gretchen Macy)
- G19 **Kristen Ruga** Perceived Personality Trait Alignment with Job Satisfaction (Dr. Tony Paquin)
- G20 **Joshua Ritchie** Unmet Needs and Barriers to Service Delivery for Deaf Persons in Rural Areas (Dr. Tina Peterson)
- G21 **Eve Welte** The Use of Yoga Breathing Exercises to Reduce Anxiety in Those Who Stutter (Ms. Janice Smith)

- G22 **Erika Dawkins, Akihiko Michimi, Gregory Ellis-Griffith, Tina Peterson, Daniel Carter, and Gary English** Untreated Dental Caries Among Children Visiting a Mobile Dental Clinic: A Retrospective Study in South Central Kentucky (Dr. Akihiko Michimi)

**Graduate Poster Session 5: Social Sciences/Services**

**Room: GRH 1065**

**Judges: Dr. Dana Burr Bradley (moderator), Dr. Sandra Hughes**

- G23 **Timothy Gilbert** Hard-to-Reach: Gay Men Living and Coping with HIV/AIDS in Rural Communities (Dr. Tina Peterson)
- G24 **Julie Scott, Darlene Applegate, and Edward Kintzel** A Study of Cultural Modifications and Taphonomic Alterations on Prehistoric Human Skeletal Remains From Crystal Onyx Cave (15Bn20), Barren County, Kentucky Using the Large Chamber Scanning Electron Microscope (Dr. Darlene Applegate)
- G25 **Reena Karki** Prevalence of Uncontrolled Hypertension and Controlled Hypertension Among Adults in South Central Kentucky, 2006-2012 (Dr. Akihiko Michimi)
- G26 **Julana Smith** Parent Perspective of the Executive Function in Their Child with Autism (Ms. Janice Smith)
- G27 **Brittany Crowley, Adam Sondag, Lisa Duffin, and Steven Winger** Pre-service Teachers' Perceptions of What It Means to "Learn a Lot" (Dr. Steven Winger)
- G28 **Prachi Chavan, Vickie Poore, Scott Smith, and Gretchen Macy** Prevalence of Seat Belt and Booster Seat Among Drivers, Passengers and Children in Barren, Hart and Metcalfe County in Kentucky, USA, 2012 (Dr. Gretchen Macy)

**Graduate Poster Session 6: Social Sciences/Services**

**Room: GRH 1065**

**Judges: Dr. Wanda G. Chandler (moderator), Mr. Thomas J. Reece**

- G29 **Wanda Bowser** Culturally and Linguistically Different (CLD) Populations Coursework in Communication Disorders Programs (Ms. Janice Smith)
- G30 **Kerry Duck, Adrian Gregory, Kathryn Briggs, and Steven Winger** Breaking the Wall: Overcoming Barriers to Learning (Dr. Steven Winger)
- G31 **Savitri Grover, William Mkanta, Cecilia Watkins, and Frank Wensheng Fan** Factors Influencing the Decision and Ability to Seek Healthcare Service Among HIV/AIDS Patients in Tanzania (Dr. William Mkanta)
- G32 **Bernadette Ombayo** Interventions for Behavioral Problems in Children of Incarcerated Parents (Dr. Tina Peterson)
- G33 **Tessa Seidler, Amber Schroeder, and Cameron Lile** Examining Energy Regulation as a Predictor of Gender Discrimination Responses (Dr. Amber Schroeder)
- G34 **Whitley Stone, Mark Schafer, Gina Sobrero, Scott Arnett, Scott Lyons, James Navalta, and Steven Bean** Muscular Endurance, Agility, and Flexibility in Crossfit vs. Weight-Trained Individuals (Dr. Mark Schafer)

## **Graduate Poster Session 7: Natural Sciences**

**Room: GRH 1089**

**Judges: Mr. Joseph Islas (moderator), Dr. Lawrence Snyder**

- G35 **Andrew Austin** Six Sigma in a Computer Integrated Manufacturing (CIM) Cell (Dr. Ahmed Khalafallah)
- G36 **Daniel Nedvidek** Evaluating the Impact of Injection Wells and the Effectiveness of Regulatory Sampling Protocols for Stormwater on Groundwater Quality in Karst Regions (Dr. Jason Polk)
- G37 **Azuakolam Nwosu** Developing a Scorecard as a Tool for Building of Residential Housing (Dr. Ahmed Khalafallah)
- G38 **Denise Anderson and Petra Collyer** Evaluation of Toxic Element Deposition in Horses and Horse-Keeping Environments in South-Central Kentucky (Dr. Petra Collyer)
- G39 **Divya Jyothi Lella** Functionalization and Modification of Shikonin Compounds as HER2 Inhibitors (Dr. Cheryl Stevens)
- G40 **Jeremy London and Andrew Reeder** Paleovalley Plays: A Closer Look Into the Main Consolidated Field, Crawford County, Illinois (Dr. Michael May)
- G41 **Brady Garabato, Bangbo Yan, and Jeremy Maddox** Synthesis and Computational Studies of a New Class of Lanthanide Niobate Cluster:  $Y_4(Nb_2O_6)(SO_4)_5 \cdot 9(H_2O)$ ; Y= Dy, Tb (Dr. Bangbo Yan)

## **Undergraduate Poster Session 1: Interdisciplinary**

**Room: GRH 1091**

**Judges: Dr. Ferhan Atici (moderator), Dr. Tim Gott**

- UG01 **Darren Tinker** Chess: The Truth of Power and Leadership (Dr. Wieb Van Der Meer)
- UG02 **Timothy Bucklew** Horse Rein Testing (Dr. Stacy Wilson)
- UG03 **Justin Clark** Diagnostics in Chess and Medicine (Dr. Wieb Van Der Meer)
- UG04 **Dagan Dalton and Jennifer Cribbs** Defining a "Math Person" (Dr. Jennifer Cribbs)
- UG05 **Matthew Crumpler and Mark Cambron** Third Generation Elephant Collar (Dr. Mark Cambron)
- UG06 **Kendall Miller** Chess and the Developing Mind (Dr. Wieb Van Der Meer)

## **Undergraduate Poster Session 2: Business and Humanities**

**Room: GRH 1091**

**Judges: Dr. Phillip Coleman (moderator), Mz. Trish Lindsey Jagers**

- UG07 **Benjamin Aroh, Robert Burnett, Wil Clouse, and Ron Rizzo** Marketing a Submersible Robot (Dr. Stacy Wilson)
- UG08 **Brandon Moss** Analysis of Public Education System Informatics (Dr. Evelyn Thrasher)
- UG09 **Hanna Demirjian** The Evolution of 20<sup>th</sup> Century Fashion (Prof. Matthew Tullis)
- UG10 **Michelle Gilstrap** Command Your Keyboard (Prof. Jo-Anne Ryan and Mr. David Brinkley)
- UG11 **Lindsey Yadon** Exploring the Development of American Art Animation (Prof. Matthew Tullis)
- UG12 **Mariah Callis** The Hays Cemetery: Gender Representation on Gravestones (Dr. Kate Hudepohl)

### **Undergraduate Poster Session 3: Humanities**

**Room: GRH 2002**

**Judges: Dr. Jane Fife (moderator), Prof. Roxanne Spencer**

- UG13 **Amber Persinger** Amazing Art Nouveau Artists (Prof. Matthew Tullis)
- UG14 **Christopher Mundy** Pioneer Cartoonists (Prof. Matthew Tullis)
- UG15 **Courtney Cheatwood** The 7 Methods of Co-Teaching (Mr. David Brinkley)
- UG16 **Cori Haber** Oversized Ideas (Prof. Matthew Tullis)
- UG17 **Don Dunn** Pioneers of Logo Design (Prof. Matthew Tullis)
- UG18 **Adam Johnson** Luxury and Leisure (Dr. Audrey Anton)

### **Undergraduate Poster Session 4: Humanities**

**Room: GRH 2002**

**Judges: Dr. Alison Langdon (moderator), Dr. Matthew Foraker**

- UG19 **Tyler Prochazka** An Uprising in Turmoil: The Role of Islam in the Syrian Revolution (Dr. Nahed Zehr)
- UG20 **Julie Washer** Examining American Children's Book Illustrations (Prof. Matthew Tullis)
- UG21 **Marilyn Kallstrom** Harlaxton College: An Interactive Experience (Ms. Kelley Coppinger)
- UG22 **Meagan Stinnett** Surrealism (Prof. Matthew Tullis)
- UG23 **Moriah Dixon** Women in the Minds of Expressionists (Prof. Matthew Tullis)
- ~~UG24 **Cherita Black** Poetry Writing with Older Individuals in Long-Term Care Facilities (Dr. Dana Bradley) canceled~~

### **Undergraduate Poster Session 5: Natural Sciences**

**Room: GRH 2003**

**Judges: Dr. Leslie North (moderator), Prof. Elisabeth Knight**

- UG25 **Aaron Tagliaboschi** Development of a Mathematica-Based Interface to the Potential Energy Surface (POTLIB) of Chemical Reactions (Dr. Jeremy Maddox)
- UG26 **Adrienne Floyd, Jarred Grider, Samuel Burns, and William Orndorff** Alternative Fuels From Wood (Dr. Christopher Byrne)
- UG27 **Ashley McCloughan** Analyzing Rainwater Harvesting as a Way to Mitigate Stormwater Runoff and to Decrease Potable Water Usage at WKU (Dr. John All)
- UG28 **Charles Coomer and Rodney King** Identification of Bacterial Contaminates and Evidence for Temperate Phages in Beerwell Samples From a Bioethanol Production Facility (Dr. Rodney King)
- UG29 **Stephanie Hagan** Paleontological Study of the Mercury Levels in Ancient Bats (Dr. Cathleen Webb)
- UG30 **Aaron Daley** Comparing Two- and Three-Dimensional Analyses of Western Kentucky University's 2013 Concrete Canoe (Dr. Matthew Dettman)

### **Undergraduate Poster Session 6: Natural Sciences**

**Room: GRH 2003**

**Judges: Dr. Lynette Smith (moderator), Dr. Cangliang Shen**

- UG31 **Joshua Dye and Steven Buchanan** WKU Submersible Project (Dr. Stacy Wilson)
- UG32 **Celia Whelan and Kevin Williams** Reaction Rates of Amino Acids with Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams)
- UG33 **Connor VanMeter, Rodney King, and Claire Rinehart** MyOTP, a Newly Discovered Mycobacteriophage From Bowling Green, Kentucky (Dr. Rodney King)
- UG34 **Jordan Cottingham, Michael Powers, Jason Howard, and Casey Pearce** Reconnaissance Mapping of Asphalt Rock in Logan County, Kentucky (Dr. Michael May)
- UG35 **William Hawley and Matthew Nee** Concentration Effects on Aqueous Nitrate Ion Symmetry (Dr. Matthew Nee)
- UG36 **Adam Edge, Bruce Schulte, and Jerry Daday** Examining Human Perception of African Elephants (*Loxodonta africana*) and Large Trees for Insights Into Conservation of an African Savanna Ecosystem (Dr. Bruce Schulte)

### **Undergraduate Poster Session 7: Natural Sciences**

**Room: GRH 2005**

**Judges: Dr. Vladimir Dobrokhotov (moderator), Dr. Andrew West**

- UG37 **Cynthia Tope** Reactions of the Amino Acids Cysteine, Methionine, and Histidine with Analogs of the Anticancer Drug Cisplatin (Dr. Kevin Williams)
- UG38 **Corbin Allender, Grace Babbs, Rodney King, and Claire Rinehart** Exploring Genetic Diversity By Isolating and Comparing Novel Bacteriophages (Dr. Rodney King)
- UG39 **Jonathan Field, Justin Hayes, Michael Bradshaw, and Robert Choate** Duct/ Duct Taped Specimen Fatigue Tester (Dr. Robert Choate)
- UG40 **Andrew Staggs, Keith Andrew, and Michael Carini** A Nonlinear Coupled Equation Blazar Jet Model (Dr. Keith Andrew)
- UG41 **George Jones and Claire Rinehart** Identifying the Transcriptional Start Site for the Repressor Gene in the Mycobacteriophage Backyardigan (Dr. Claire Rinehart)
- UG42 **Sam White and Matthew Nee** Dependence of Raman Spectra of Aqueous Nitrate on Laser Intensity and Ionic Strength (Dr. Matthew Nee)

### **Undergraduate Poster Session 8: Natural Sciences**

**Room: GRH 2005**

**Judges: Dr. Kari Everett (moderator), Ms. Amanda Seaton**

- UG43 **Victoria Gilkison, Jarrett Johnson, and Albert Meier** Comparisons of Genetic Diversity Between Core and Disjunct Populations of *Magnolia tripetala* (Dr. Jarrett Johnson)
- UG44 **William Nalle** SCADA Research Project (Dr. Stacy Wilson)
- UG45 **Nick Cottrell and Bangbo Yan** Synthesis and Crystal Structure of a Two-Dimensional Metal-Organic Framework (Dr. Bangbo Yan)

- UG46 **Mariel Shumate, Matthew Turner, and Vladimir Dobrokhoto** A Novel Integrated Thermocatalytic Sensor for Trace Detection and Recognition of Combustible Substances (Dr. Vladimir Dobrokhoto)
- UG47 **Alice Byrne, Jeremiah Sharpsteen, Jack Ferguson, and Matthew Byrne** Application of Perlyenediimide Functionalized Siloxane Nanoparticles and Poly(3-Hexylthiophene) in Thin Film, Flexible Organic Photovoltaics (OPVs) (Dr. Hemali Rathnayake)
- UG48 **Hannah Graff, Rodney King, and Claire Rinehart** Discovery and Analysis of Mycobacteriophage Capnhook (Dr. Rodney King)

### **Undergraduate Poster Session 9: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Petra Collyer (moderator), Mr. Nathan Phelps**

- UG49 **Lara van der Heiden and Cathleen Webb** Mercury Analysis in Rafinesque Big Eared Bat Populations (Dr. Cathleen Webb)
- UG50 **Aaron Brzowski, Keith Andrew, and Phillip Womble** Geodesic Equations for the Alcubierre Metric (Dr. Keith Andrew)
- UG51 **Ryan Gott** Understanding the Haptic Response for Wood Finishes (Dr. Christopher Byrne)
- UG52 **Roxanne Coburn** Characterizing Sediment Deposition in Crumps Cave, Kentucky Using Cesium Dating and Physical Analyses (Dr. Chris Groves)
- UG53 **David Keltner, Andrew Johnson, Jake Doran, and Evan Pitt** Accuracy and Precision Test Fixture for Evaluating a Range of Weapon Platforms (Dr. Joel Lenoir)
- UG54 **Jarad Williams and Rodney King** Potential Antiterminator RNA Discovered in *Enterobacter aerogenes* Strain KCTC2190 (Dr. Rodney King)

### **Undergraduate Poster Session 10: Natural Sciences**

**Room: GRH 2006**

**Judges: Dr. Carl Dick (moderator), Ms. Lee Ann Smith**

- UG55 **Lindsey Porter, Rodney King, and Claire Rinehart** The Isolation and Characterization of Mycobacteriophage Pigpen (Dr. Rodney King)
- UG56 **Holly Young and Thomas Kingery** Warren County Kentucky Beekeepers' Knowledge and Utilization of Existing Technologies (Dr. Thomas Kingery)
- UG57 **Matthew Gonzalez, David Donald, Rammohan Paripelly, and Dillon Pender** Interaction of Human Fibroblast Growth Factor-1(HFGF-1) with Anti-Angiogenic Drug Myo-Inositol (Dr. Rajalingam Dakshinamurthy)
- UG58 **Marcus Bagwell, Jr.** April 24, 2010 Severe Storms (Dr. Joshua Durkee)
- UG59 **Frank Murdock, Jeremy Nutt, James Roberts, Doug Harper, and Ron Rizzo** Construction of a Touchscreen Cycle Tester (Dr. Christopher Byrne)
- UG60 **Micaela Montgomery, Jacob Fose, and Philip Lienesch** Competition for Food Resources of the White Bass by Two Introduced Congeners in Barren River Lake (Dr. Philip Lienesch)



### **Undergraduate Poster Session 11: Natural Sciences**

**Room: GRH 2009**

**Judges: Dr. Matthew Nee (moderator), Mrs. Jae Kim**

- UG61 **Helen Thompson and Vivek Badwaik** A New Class of Gold Nanoantibiotics: Direct Coating of Ampicillin on Gold Nanoparticles (Dr. Rajalingam Dakshinamurthy)
- UG62 **Patrick Osterhaus, Ajit Deshpande, Rodney King, and Claire Rinehart** Discovery and Genomic Comparison of Bacteriophages Updawg and Pandakarenina (Dr. Rodney King)
- UG63 **Ryan Phelps, Corbin LeMieux, Hannah Simmons, Hannah Weber, Naomi Rowland, and Martin Stone** USDA Certified Organic Foods Test Positive for Genetic Modification (Dr. Martin Stone)
- UG64 **Rachel Beyke and John Clark** Eastern Black Rhino Home Range Activity Based on Human Disturbances (Dr. Michael Stokes)
- UG65 **Joey Pruitt, Jordan Knifely, Asa Darnell, Muhammed Rayis, and Kevin Schmaltz** WKU Biofuels (Dr. Kevin Schmaltz)
- UG66 **Matthew Byrne** Carbon-Based Thermoelectric Nanoarrays From Siloxane Functionalized Fused Arenes (Dr. Hemali Rathnayake)

### **Undergraduate Poster Session 12: Natural Sciences**

**Room: GRH 2009**

**Judges: Dr. Gordon Baylis (moderator), Dr. Cynthia Houston**

- UG67 **Samantha Hawtrey and Leah Kottyan** Two Genetic Effects at the IRF5/TNPO3 Locus Are Independently Associated with the Development of Specific Lupus Symptoms (Dr. Rodney King)
- UG68 **Timothy Moyer** CNC Machining Capability Study Using Full Carbide Tooling (Dr. Joel Lenoir)
- UG69 **Nitin Krishna and Hannah Pennington** Quantifying Parameters in a Mathematical Model on the Interaction of Matrix Metalloproteinases and Their Inhibitors in a Wound (Dr. Richard Schugart)
- UG70 **McKinley Mason, Brandon Farmer, and Matthew Nee** Concave Porosity Non-Polar Beads By a Modified Microbubble Fabrication (Dr. Matthew Nee)
- UG71 **Madison Preece and Saleha Vuyyuri** The Effects of Combinations of 2-Deoxy-d-Glucose or Diethyl Maleate with Ascorbic Acid on the Growth of Non-Small Cell Lung Cancer (Dr. Keith Davis, University of Louisville)
- UG72 **Hannah Rodgers, Rammohan Paripelly, and Dillon Pender** Single Step, Antibiotic Mediated Synthesis of Gold Nanoparticles with Potent Antimicrobial Activity (Dr. Rajalingam Dakshinamurthy)

### **Undergraduate Poster Session 13: Natural Sciences**

**Room: GRH 2010**

**Judges: Dr. Rajalingam Dakshinamurthy (moderator), Dr. Ann Ferrell**

- UG73 **John Runyon and R. Daulton Cockerell** 3D Rendering Solutions for Engineers (Dr. Joel Lenoir)
- UG74 **Dorothy Richardson** Reaction Coordinate Calculations for Simple Chemical Reactions (Dr. Jeremy Maddox)

- UG75 **Tyler Binkley, Andrew Dockery, Ryan Difani, John Thomas, Michael Flanigan, and Quentin Walker** A Case Study of a Rare Long-Track EF-3 Tornado in Eastern Kentucky (Dr. Joshua Durkee)
- UG76 **Gretchen Walch, Rodney King, and Claire Rinehart** A Newly Discovered Cluster E Mycobacteriophage Identified Through Genomic Analysis (Dr. Rodney King)
- UG77 **James Hughes** A Search for Hidden Molecular Clouds in the Milky Way (Dr. Steven Gibson)
- UG78 **Reed Gonzalez, Sean Miles, Aaron Huffman, and Matt Eubanks** Air Flow Visualization System (Dr. Robert Choate)

#### **Undergraduate Poster Session 14: Natural Sciences**

**Room: GRH 2010**

**Judges: Dr. Keith Andrew (moderator), Dr. Andy Mienaltowski**

- UG79 **Mackenzie Farrar** Exploring Applications of Ag Colloids in Surface Enhanced Raman Spectroscopy (SERS) (Dr. Matthew Nee)
- UG80 **Dylan Ward, Clayton Cook, Josh Rodgers, Josh Clemmons, Michael Doyel, Omar Ramadan, and Yulizza Henao** Analysis and Interpretation of the 2013 WKU Steel Bridge Competition (Dr. Shane Palmquist)
- UG81 **Vishnu Tirumala, Alex Kearns, Rodney King, and Claire Rinehart** A Comparison of Two Newly Discovered Mycobacteriophages Isolated From Different Geographical Regions in Kentucky (Dr. Rodney King)
- UG82 **Mary Spraggs** Properties of Cold Galactic Interstellar Clouds (Dr. Steven Gibson)
- UG83 **Tori Buckley, Gabrielle Ison, Rammohan Paripelly, and Rajalingam Dakshinamurthy** Expression, Purification and Identification of Fibroblast Growth Factor-1 (Dr. Rajalingam Dakshinamurthy)
- UG84 **Samuel Burns** Closing the Reverse Engineering Loop: Laser Scanning as the Bridge From Legacy Part to CAD to CNC Machining (Dr. Joel Lenoir)

#### **Undergraduate Poster Session 15: Natural Sciences**

**Room: GRH 3005**

**Judges: Dr. Jason Polk (moderator), Dr. Melinda Grimsley-Smith**

- UG85 **Jonathan Serpico** Use of Computational Simulations for Analysis of Parity Violating Experiments with Neutrons (Dr. Ivan Novikov)
- UG86 **Elaine Flynn, Lisa Boush Park, and Amy Myrbo** Carbon and Oxygen Isotopes on Carbonates From Watling's Blue Hole and Blue Hole Five, San Salvador, Bahamas (Dr. Cathleen Webb)
- UG87 **Chris Johnson, Michael Flanigan, Emily Yates, and Quentin Walker** 15-Year Anniversary of the 16 April 1998 Mid-South Severe Weather Outbreak (Dr. Joshua Durkee)
- UG88 **William Storrs, William Johnson, Matt Ruffner, Michael Bradshaw, and Andrew Keltner** Developing a Four-Rotored Radio Control Helicopter for Photography and Photogrammetry Applications (Dr. Joel Lenoir)

UG89 **Amy Ni, Mackenzie Perkins, Huifang Sun, and Michael Smith** Effects of Growth Hormone (GH) Antagonist on Zebrafish Auditory Hair Cell Regeneration (Dr. Michael Smith)

UG90 **Roger Dame** Genetic Transformation of Basil (Dr. Chandra Emani)

### **Undergraduate Poster Session 16: Natural Sciences**

**Room: GRH 3005**

**Judges: Mrs. Begum Fouzia (moderator), Mr. Chad Phillips**

UG91 **Emily Mesker** A Civil Engineering Student's Crash Course in Concrete Canoe Hull Design (Dr. Matthew Dettman)

UG92 **Scotty Davis, II and Claire Rinehart** Identification of Short DNA Repeats and Their Functions in Mycobacteriophages (Dr. Claire Rinehart)

UG93 **Isaac Kresse** An Analysis of Raman Spectroscopy on Photocatalytic Reactions (Dr. Matthew Nee)

UG94 **Anna Hamilton and Grace Babbs** Costa Rican Dung Beetle Studies (Dr. Keith Phillips)

UG95 **Thomas Murray and Jeremy Maddox** Quantum Potential Calculations for Wavepacket Dynamics (Dr. Jeremy Maddox)

### **Undergraduate Poster Session 17: Social Sciences/Services**

**Room: GRH 3006**

**Judges: Dr. Diane Lickenbrock (moderator), Ms. Nancy Mager**

UG96 **Allison Steen and Meagan Luttrell** Effects of Reward Motivation on Item and Associative Memory (Dr. Sharon Mutter)

UG97 **Christina Hays, Delnetta Edge, and Reginald Baxter** Effect of Religion on the African American Male (Dr. Gary Villereal)

UG98 **Jessica Parks and Aaron Wichman** Can Persuasion Research Increase Commitment to Breastfeeding? A Test of Women's Resistance to Infant Formula Messages (Dr. Aaron Wichman)

UG99 **Katryn Steenbergen** Educational Needs, Interest, Behaviors, and Readiness for a Community Education Program Aimed to Reduce Hip Fractures Due to Falls in Senior Citizens in a Select Kentucky County (Dr. Scott Arnett)

UG100 **Ariel Gerall and Mallory Scanlon** Roc N' Pop (Ms. Sheila Flener)

UG101 **Emma O'Grady, Charvinia Neblett, and Steven Wininger** No Tunes Allowed: Can Listening to Music Improve Your Exercise Performance? (Dr. Steven Wininger)

### **Undergraduate Poster Session 18: Social Sciences/Services**

**Room: GRH 3006**

**Judges: Dr. Jonghee Shim (moderator), Dr. Aaron Wichman**

UG102 **Caitlin Gover** Analysis of House Bill One, the "Pill Mill Bill" (Dr. Gregory Ellis-Griffith)

UG103 **Havyn West, Thomas Reece, Ciara Cyr, Juliana Eovino, Molly White, Michael Armstrong, and Brittany McCarthy** Man's Search for Body Satisfaction (Dr. Rick Grieve)

- UG104 **Katherine Miller and Trisha Pardue** Blender's Box (Ms. Sheila Flener)  
 UG105 **Shannon Boone** Do Self-Harm Behaviors and Depression Predict Parent and Peer Support? (Dr. Amy Brausch)  
 UG106 **Pamela Lindsey, Brenna Gorman, and Amanda Greenwell** Corporal Punishment (Dr. Gary Villereal)  
 UG107 **Kathryn Briggs, Adrian Gregory, Kerry Duck, and Steven Winger** Predicting Course Performance via Self-Regulation Constructs (Dr. Steven Winger)

### **Undergraduate Poster Session 19: Social Sciences/Services**

**Room: GRH 3076**

**Judges: Dr. Donielle M. Lovell (moderator), Ms. Beth Truax Armstrong**

- UG108 **Ashley King and Raymond Poff** Students Serving People: Perceived Benefits of Direct Community Service (Dr. Raymond Poff)  
 UG109 **Emily Hogan, Leah Cannady, Kelly McCoy, Casey Biggs, Courtney Keen, Krisstal Clayton, Lisa Duffin, and Sarah Ostrowski** An Investigation of Adverse Life Events Experienced by WKU Students (Dr. Krisstal Clayton)  
 UG110 **Amber McGrew, Christopher Smith, Brittany Dickens, and Susan Babb** Women Have Higher GPA's Than Men (Dr. Gary Villereal)  
 UG111 **Mary Higginson and Steven Winger** Honors Versus Non-Honors College Students: How Are They Different? (Dr. Steven Winger)  
 UG112 **Patrick Hughes and Darlene Applegate** Bioarchaeological Analysis of Skeletal Remains From Grave 2 at 15A1329A, a Late Woodland-Mississippi Period Stone Box Cemetery in Allen County, Kentucky (Dr. Darlene Applegate)  
 UG113 **Brandon Coffey, Luke Aldridge, and Andrew Mienaltowski** Gender Differences in Focusing on the Bright Side of Life Explained By Empathy (Dr. Andrew Mienaltowski)

### **Undergraduate Poster Session 20: Social Sciences/Services**

**Room: GRH 3076**

**Judges: Dr. Joelle Davis Carter (moderator), Dr. D'Lee Babb**

- UG114 **Kayla Roach, Caitlin Maggard, Ratlale Mokone, and Karisha Biggers** Grade Point Average and Marijuana Use (Dr. Gary Villereal)  
 UG115 **Kathryn Drye** Cross Sectional Analysis of Noise Regulations in Kentucky Cities with Populations > 25,000 (Mr. Jeffrey Barefoot)  
 UG116 **Lindsey Burke, Kaitlyn Snyder, Carly Rentsch, Nicole Chambers, Andrew Mienaltowski, and Elizabeth Lemerise** Facial Expression Intensity and Emotion Matching (Dr. Andrew Mienaltowski)  
 UG117 **Paige Volpenhein and Stephanie Gaiko** The Effects of Static Stretching on Measures of Gross Motor Coordination During Vigorous Physical Activity (Drs. Don Hoover and Scott Arnett)  
 UG118 **Ramona Sudbeck** Facilitating Mastery Goal Orientation in the Classroom (Dr. Steven Winger)  
 UG119 **Michelle Hickman, Patty Woodward, and Connie Scales** Traditional Students' GPA vs. Non-Traditional Students' GPA (Dr. Gary Villereal)

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