

University of North Alabama

Three Minute Thesis Competition

5:00 p.m., Tuesday, April 19, 2016

Performance Center



2016 Research Days



Illustrated Paper Presentations

Guillot University Center, Room 200

Tuesday, April 19, from 10:30 a.m. to 12:00 noon

Poster Presentations

Guillot University Center, Atrium

Tuesday, April 19, from 9:00 a.m. to 10:30 a.m.

Tuesday, April 19, from 11:00 a.m. to 12:20 p.m.

Tuesday, April 19, from 2:30 p.m. to 4:00 p.m.

Oral Presentations

Stone Lodge

Wednesday, April 20, from 8:00 a.m. to 9:45 a.m.

Thursday, April 21, from 10:30 a.m. to 12:00 noon

Thursday, April 21, from 1:00 p.m. to 2:30 p.m.

Thursday, April 21, from 3:00 p.m. to 4:30 p.m.

Office of Quality Enhancement Plan

111 Wesleyan Hall • www.una.edu/ug-research • qep@una.edu

Dr. Lisa Keys-Mathews, Director • 256.765.4640

Three Minute Thesis Competition

University of North Alabama

PROGRAM

Welcome

Dr. Cynthia Stenger
Department Chair, Professor
Department of Mathematics

Brief History of 3MT

Dr. James Jerkins
Associate Professor
Department of Computer Science & Information Systems

Introduction of Judges

Dr. Carmen Burkhalter
Dean, College of Arts and Sciences

3MT Presentations

Contestants in Random Order

Voting for People's Choice

Dr. Jean Ann Helm-Allen
Assistant Professor
Health, Physical Education and Recreation

Break

Awards Ceremony

Dr. John Thornell
Vice President for Academic Affairs and Provost
Dr. Lisa Keys-Mathews
Director, Quality Enhancement Plan

People's Choice Award

Dr. Donna Lefort
Dean, College of Education and Human Sciences

Photo Opportunities

Reception in the Atrium

JUDGES

Dr. Jennifer Gray serves as the superintendent of the Lauderdale County School System. She has been an educator for twenty-five years. She received her BS and MA in Early Childhood Education and her EdS in Administration from UNA. She completed her Doctorate in Educational Leadership from Samford in 2014.



Victoria Greer works at ECM Hospital as the Ambulatory Surgery Services Manager. She moved to Florence in 2013 from Denver, Colorado, where she was a registered nurse specializing in critical care, quality, and infection control. She will graduate this semester with a Master of Science Degree in Nursing

Leadership at UNA.

Ray Koopman is the General Manager of the Navistar Facility in Cherokee Alabama. Previously, he held several engineering and manufacturing positions at General Motors. His 26 years with GM included 7½ years in Shanghai China. He graduated from the University of Michigan with a Bachelor of Science and a Master of Science in Mechanical Engineering.



JUDGES



Dr. Peter Rim is the Director and Department Chair of Engineering Technology at UNA. He received a bachelor's, a master's, and a Ph.D. from Penn State, and an MBA from the University of Richmond. He initiated and mentored VT's award winning Chem-E-Car team, which has been ranked 4th and 5th among worldwide universities the last 2 years.

Dr. Gary Dan Williams is the Principal at Waterloo School. He earned a B.S. degree in Agriscience Education from Auburn University and a M.S. and A.A. in Agribusiness Education from Alabama A&M University. He has an administration certificate from UNA and a Ph.D. in Career & Technical Education from Auburn. He helped establish *Pathfinder Alabama* to give high school students opportunities to work in paid placements related to their future career interests.



Thanks to . . .

Dr. Cynthia Stenger (Arts and Sciences) for organizing the 3MT competition with help from representatives from each of the colleges: Dr. James Jerkins (Business), Ms. Stephanie Mohr (Nursing), Dr. Jean Ann Helm-Allen (Education);

The Office of Quality Enhancement Program for support of the 3MT Competition;

The Department of Mathematics, including Ms. Jaimie Marble and Ms. Emma Fancher;

Scorekeepers Dr. Jillian Stupiansky and Dr. Lee Raney, assistant professors of mathematics.

CONTESTANT ABSTRACTS

Aaron Avery, Mathematics and Secondary Education

Bunting in Baseball: Getting it Down to Statistics

Faculty Mentor: Dr. Ashley Johnson

College of Arts and Sciences



We researched bunting and the effect that it has on the game of baseball. Using the computer program R we were able to break down bunting situations into situations where bunting actually occurred and situations where bunting could have occurred but did not. We analyzed bunt situations since 2000.

Bio: Aaron Avery is a senior secondary and math major from Cullman, Ala. He played baseball in high school and still coaches a travel baseball team in Cullman. He is a huge Braves and Alabama fan.

Vincent "Chuck" Chiriaco, Computer Science

SHA-1 Collision Attacks with Parallel Computation

Faculty Mentor: Dr. James Jerkins

College of Business



Hashing is an essential tool for securing information on the Internet. However, the most common hash function, SHA-1, is no longer safe. Our research investigates existing algorithms for finding collisions and considers parallelizing the attacks. We also constructed a 12 node Beowulf cluster that supports C, C++, and Fortran programs with the OpenMPI library.

Bio: Chuck is a graduating senior in the honors program hoping to save the world one day through a variety of different arts including math, computer science, and caring for people.

CONTESTANT ABSTRACTS



Matthew Cooper, Professional Physics,
Mathematics

The Silent Chorus

Faculty Mentor: Dr. Chong Qiu
College of Arts and Sciences

This research has focused on creating an instrument which can detect the presence of ozone in the mesosphere as well as in the lower atmosphere, with enough accuracy to tell how much ozone is present. This would then lend the ability to discern how intense the ultraviolet spectrum is that day (which causes sunburns).

Bio: Matthew Cooper is a Mississippi native. He has been involved with research projects in the Physics and Earth Science Department, which resulted in two publications, as well as the current research in the Chemistry and Industrial Hygiene Department. He currently plans to attend graduate school at the New Jersey Institute of Technology.



Jessica Danielowicz, Secondary Education,
Language Arts

*Learning Styles: Teaching to Visual, Auditory,
and Kinesthetic Learners*

Faculty Mentor: Dr. Gary Padgett
College of Education and Human Sciences

This project is an analysis of student learning styles and the way in which they affect how material is presented in the classroom. Students were evaluated to find where they fit within the following learning styles: Visual, Auditory, Kinesthetic.

Bio: Jessica Danielowicz is a member of Alpha Lambda Delta and Phi Eta Sigma honors societies, an active member of the honors program, and a Senior Resident Advisor. She is the Editor-in-Chief of Odyssey at UNA, as well as the historian of the

CONTESTANT ABSTRACTS

Honors Student Organization.

William Taylor Davis, Music Education,
Instrumental Music, P-12

Administrator Perceptions of Social Media

Faculty Mentor: Dr. Jessica Mitchell

College of Education and Human Sciences



The purpose of this research is to explore the perceptions of administrators regarding teacher-student interactions on social media sites. The methodology consists of a mixed-methods design. Three findings emerged from the research. Implications from this research are not generalizable. These implications include the need for teacher candidates to be familiar with the schools in which they interview.

Bio: Taylor Davis is a senior at UNA majoring in Music and Secondary Education. His research interests involve those that pertain to the Teacher Education and Pre-Service fields and also in the field of Music Education. As a student at UNA, Taylor has taught English as a Second Language in China and Haiti. He also plans to attend Graduate School.

Jordan Givens, Biology



Heat-shock protein expression during temperature stress in the Antarctic Nemertean worm Parborlasia corrugatus.

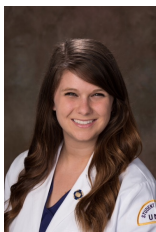
Faculty Mentor: Dr. Isaac Sleadd

College of Arts and Sciences

The nemertean worm *Parborlasia corrugatus* is an important scavenger and predator found throughout Antarctica and the Antarctic Peninsula. The goal of this study was to investigate SOD-1 expression using western blotting. A 70 kDa SOD-1 related protein was consistently present, and discovered to be heat-inducible in worms exposed to heat stress.

CONTESTANT ABSTRACTS

Bio: Jordan Givens recently graduated from UNA with a degree in environmental biology. She conducted original research with Dr. Isaac Sleadd and presented at local and national conferences, most recently the annual meeting for the Society for Integrative and Comparative Biologists. She looks forward to attending graduate school in the future.



Anna Goggins, Nursing
Stimulant Usage Among Nursing Students
Faculty Mentor: Mr. Will Brewer
College of Nursing

Within the academic community, there is a new “performance enhancer” on the rise. Stimulants (such as caffeine) have been utilized by college students to achieve in academia. Through data representing nursing students, we are able to gain an understanding of its prevalence and effects.

Bio: Anna Goggins is a senior level nursing student within the UNA College of Nursing. Through her clinicals and preceptorship, she has learned a great deal and has established a sound foundation to begin her nursing career. She has recently accepted a nurse residency position at Emory University Hospital Midtown in Atlanta, GA. Anna also serves as an RA on campus through University Residences and is an active member of Alpha Gamma Delta. This research is Anna’s Senior Honors Capstone Project within the University Honors Program.

Alex Heatherly, Health and Human Performance; Concentration: Exercise Science
Effects of a high fat diet on metabolic transitioning, body composition, and 5-km performance in male runners
Faculty Mentor: Dr. Eric O’Neal
College of Education and Human Sciences



The purpose of this pilot study was to observe if following a

CONTESTANT ABSTRACTS

high fat diet resulted in positive changes in regards to running performance. At the conclusion of testing procedures, analysis of the data indicated a reduction in body mass, body fat percent, and 5km time trial performance.

Bio: Alex Heatherly is currently a master's student at UNA completing his degree in Exercise Science. He is originally from Cullman, Alabama. Upon completion at UNA, he hopes to pursue further education in order to one day participate in teaching and research.

Chellie Hogan, Economics

The Politics of Immigration Enforcement

Faculty mentor: Dr. Keith Malone

College of Business



Illegal Immigration is a fiercely debated topic both at the national and state level. Although many laws have been established to regulate illegal immigration, critics suggest that immigration law is not being consistently enforced. This research attempts to explain the observed state-to-state variation in deportation proceedings by examining the relationship between these proceedings and various political and economic factors.

Bio: Chellie Hogan is senior Economics major from Hartselle, Alabama. After earning her undergraduate degree, Chellie plans to begin a graduate program in Economics this fall, with the ultimate goal of attaining a Ph.D. in Economics. Chellie serves as a College of Business Ambassador as well as President of Phi Beta Lambda.



Jacob Jackson, Political Science

Democracy and Human Rights: a case study

Faculty Mentor: Dr. Leah Graham

College of Arts and Sciences

The expectation of scholarship is a linear relationship

CONTESTANT ABSTRACTS

between democracy and human rights (Henderson, 1991; Poe and Tate, 1994). Specifically we expect that as a country becomes more democratic, it will raise its standards on human rights. I test and trace this process over time in Brazil, Cuba, and Guatemala.

Bio: Jacob Jackson is from Sheffield, Ala. He is a junior at UNA, and is majoring in political science with a minor in legal studies. After his time at UNA, he hopes to enroll in a dual-degree program to obtain both a J.D. and a Ph.D. in government. After that, he hopes to teach law and government at a university.

Alyson Mavromat, Mathematics and Secondary Education

Effectiveness of Supplemental Instruction at UNA

Faculty Mentor: Dr. Cynthia Stenger

College of Arts and Sciences



Many students struggle with introductory mathematics courses. My research explores whether supplemental instruction (SI) is an effective means to help students succeed in college mathematics. Beyond success in a single class, I investigate whether SI has long term effects on student retention through increased engagement in college life.

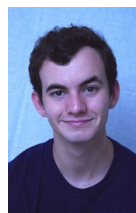
Bio: Alyson Mavromat graduated from Scottsboro High School in 2012 and is currently a senior at UNA. She works for UNA's Mathematics Department as a math fellow and tutors high schoolers in math throughout the week. After graduation in December, she hopes to get a job teaching middle or high schoolers math.

James McKee, Physics

Searching for Micrometeorites in Rain water

Faculty Mentors: Dr. Mel Blake, Dr. Richard Statom,
Dr. Chong Qiu

College of Arts and Sciences



CONTESTANT ABSTRACTS

When small bits of dust from comets hit the earth's atmosphere, they create a brief flash of light that we see as a meteor. About two tons of material is added to the Earth everyday from these events. The particles become part of the dust in the air that water condenses upon to fall as rain. So rainwater contains meteorites. We are conducting a pilot study to search for micrometeorites in rainwater and determine the best collection method and conduct preliminary analysis. In the future we hope to involve high school students in this project as a citizen science outreach program.

Bio: James McKee is a physics major who is interested in astronomy as a career. He is from Harvest, Ala.



Ahn Nguyen, Geography

Law Enforcement Return on Investment (ROI): A GIS Analysis

Faculty Mentor: Dr. Francis Koti
College of Arts and Sciences

This study examines the relationship between crime rate and law enforcement spending in cities. Crime data obtained from the FBI was assembled in ArcGIS software. Statistical tests were run to determine relationships. Results indicate that there is no significant relationship between large law enforcement spending and low crime rate in small-sized cities.

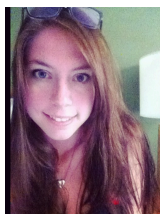
Bio: Anh Nguyen is a geography major looking to graduate with a BS in Geographic Information Systems in the Fall 2016. A native of Vietnam, Anh has spent the last nine years in the U.S. She loves to travel and experience new cultures and places.

Nealey Sims, Professional Physics

Gemstone Holography

Faculty Mentor: Dr. Brian Thompson
College of Arts and Sciences

CONTESTANT ABSTRACTS



We have set up a platform using three different color lasers to create multicolor reflection holograms. With this platform we have created holograms of opal, reproducing its opalescence that can't be captured in a photograph. We plan to create holograms of different gemstones that display other unique optical properties.

Bio: A senior obtaining a degree in professional physics at UNA, Nealey Sims is most interested in large-scale planetary processes (earthquakes, volcanism, structural phenomenon, etc.) that can be studied using seismic waves, gravity, and magnetic data. Nealey will be starting a graduate degree in geophysics this fall.

Rachel Suddreth, Political Science and German
Haiti and Dutch Indonesia: A comparative study of the economic ramifications of colonial legacy on states through the "gift" of futured or futureless language

Faculty Mentor: Dr. Leah Graham
College of Arts and Sciences



This research is to determine the effects of a Colonizer's language and structure on the Colonized. I propose that states that were colonized by a country that speaks a futureless language will have a more stable and better developed economy than a state that was colonized by a futured language speaking country.

Bio: Rachel Suddreth is from Birmingham, Ala. She is a senior at UNA and is double majoring in German and Political Science. After graduating she hopes to go on to graduate school for a Masters in Anthropology.

CONTESTANT ABSTRACTS



Caroline Thomas, Professional Biology
Stressed? How FKBP Proteins Can Help!
Faculty Mentor: Dr. Tina Hubler
College of Arts and Sciences

Understanding the regulation of FKBP4 and FKBP5 proteins and their effects on cortisol can have future implications for combating stress disorders such as depression and PTSD. Our research seeks to understand the regulatory mechanisms of the genes FKBP4 and FKBP5. Our data suggest that mechanisms controlling mRNA levels are important for the overall protein levels.

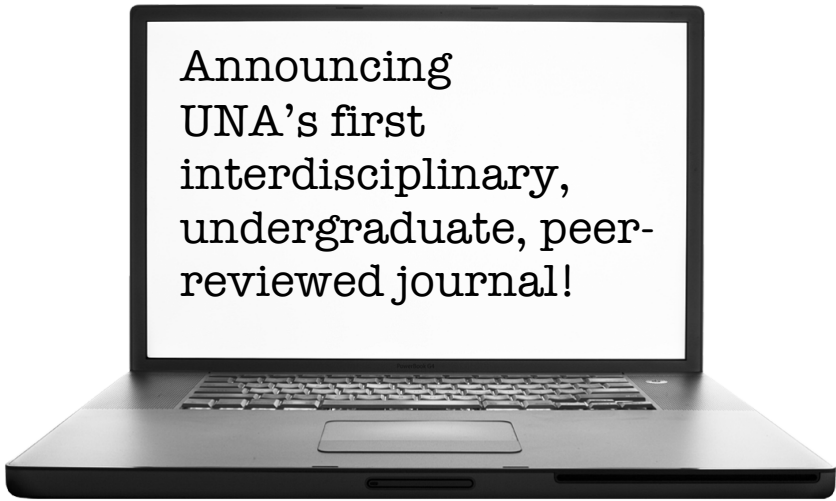
Bio: Caroline Thomas is a Pre-Medical student who will graduate in May with a Bachelor of Science in Professional Biology and Chemistry minor. She has been an active member in UNA's Honors Program and honor societies Phi Kappa Phi, Tri-Beta, and Alpha Epsilon Delta.

Tyler Yasaka, Computer Science
Improving Learning with Simple Immersive Virtual Environments
Faculty Mentor: Dr. Jason Watson
College of Business



In our study, we investigate the potential of using head-mounted stereoscopic displays (HMDs) to aid in the learning of new information. The results of our study improve understanding of how new VR technology can be used to help improve learning where chaotic physical environments are difficult to avoid.

Bio: Tyler Yasaka is a Computer Science major and HCI/UX minor. He will be graduating in May and plans to start working full time as a software developer at PartCycle Technologies.



Become a part of this exciting new project from QEP!

We need:

- Undergraduate Students to submit their research for publication
- Undergraduate and Graduate Students to serve as reviewers
- Faculty and Staff to serve as reviewers
- Graphic artists to work on layout and design

Full details will be announced in May.
For more information, write us at
qep@una.edu.

