

EIGHTEENTH ANNUAL  
**Graduate Research  
Symposium**

Sponsored By: **GRADUATE SCHOOL & RESEARCH**



ART BY:

**Frank Vickery** *MFA student in ceramics*

*Pieces are made from stoneware and  
fired in a high fire, reduction kiln.*



MARCH 11, 2010 | 11AM - 8PM | UNIVERSITY CENTER

**Western  
Carolina**  
UNIVERSITY

EIGHTEENTH ANNUAL

# Graduate Research Symposium

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Dear Participants,

Welcome to the Eighteenth Annual Graduate Research Symposium. Since 1992, the Graduate Research Symposium, sponsored by Graduate School and Research, has provided graduate students the opportunity to showcase their scholarly research and projects. I want to express my sincere appreciation to you for sharing your scholarly and creative work. In addition, I congratulate all the participating faculty and staff mentors for supporting and encouraging our presenters to participate in this meaningful experience.

For many of you, this will be your first opportunity to share empirical findings and creative works with the academic community. Today, you take the first step in becoming recognized as a scholar in your chosen discipline. The skills that you learn as part of the research process and your ability to convey that research in writing and in person will enable you to establish your authority within your discipline and to improve the world in which we live.

I congratulate you on this significant milestone in your academic development. It is my hope that your experience today inspires you to continue to think about how you might contribute to our understanding of the significant issues facing our region, our state, and our world and propels you to take action.

I look forward to meeting each of you and having the opportunity to talk with you about your important work and your plans for the future. A celebration has been planned in your honor in the University Center Grand Room starting at 5:00pm. Come join your colleagues.



Scott E. Higgins  
Dean, Graduate School and Research

## Activities Overview

### 11AM

HUMANITIES ..... Rogers Room  
SCIENCES ..... Cardinal Room  
EDUCATION ..... Catamount Room  
ENGINEERING AND  
TECHNOLOGY ..... Multipurpose Room A  
SCIENCES ..... Multipurpose Room B

### 12:30PM

HUMANITIES ..... Rogers Room  
HUMANITIES ..... Cardinal Room  
FINE AND  
PERFORMING ARTS ..... Catamount Room  
ENGINEERING AND  
TECHNOLOGY ..... Multipurpose Room A  
SOCIAL SCIENCES ..... Multipurpose Room B  
HEALTH ..... Theater

### 2PM

HUMANITIES ..... Rogers Room  
SCIENCES ..... Cardinal Room  
FINE AND  
PERFORMING ARTS ..... Catamount Room  
ENGINEERING AND  
TECHNOLOGY ..... Multipurpose Room A  
ENGINEERING AND  
TECHNOLOGY ..... Multipurpose Room B  
HEALTH ..... Theater

### 3:30PM


HUMANITIES ..... Rogers Room  
BUSINESS ..... Cardinal Room  
HUMANITIES ..... Catamount Room  
ENGINEERING AND  
TECHNOLOGY ..... Multipurpose Room A  
EDUCATION ..... Multipurpose Room B  
HEALTH ..... Theater

### 5PM

RECEPTION AND AWARDS ..... Grandroom

### 6:30PM

SOCIAL SCIENCES ..... Multipurpose Room A  
FINE AND PERFORMING ARTS,  
SCIENCES, HUMANITIES,  
AND HEALTH ..... Multipurpose Room B

 North Carolina Research Recognition  
Special Recognition and Award for Research  
related to the economic, cultural, and artistic  
development of the State of North Carolina.

### Student News Releases

WCU's Office of Public Relations routinely sends news releases about student activities and honors to the students' hometown/local newspapers. Participants in the Graduate Research Symposium who wish to take advantage of that service should visit the Web site <http://www.wcu.edu/22961.asp> to fill out an online form and submit it via e-mail to the Public Relations Office.

The Public Relations Office also can send photographs of students to their hometown/local newspapers to accompany the news releases. Students who wish to take advantage of that service are invited to come to Room 420 in H.F. Robinson Administration Building to have their photographs taken between 2 p.m. and 5 p.m. on one of these days:

**Thursday, April 22**  
**Wednesday, April 28**  
**Tuesday, May 4**

Students with scheduling conflicts that prevent them from taking advantage of these photo sessions may make a special appointment to have a photograph taken by calling the Public Relations photography office at 828-227-3081.

Students' personal photos will be considered for use, depending on quality. Head-and-shoulders shots may be e-mailed to [rholcomb@wcu.edu](mailto:rholcomb@wcu.edu).

### Western Carolina University

Western Carolina is a campus of the University of North Carolina system and enrolls more than 9,000 students. WCU is located in a beautiful valley between the Blue Ridge and Great Smoky Mountains, an hour west of Asheville, N.C., and 2.5 hours northeast of Atlanta, Ga. Here you will find convenient access to a region that offers tremendous opportunities for outdoor research and recreation. Engagement of students and faculty in service learning and other community activities is a critical part of WCU's tradition of academic excellence.

## 11AM-12:15PM

**HUMANITIES** | English | UC 209 | Rogers Room  
ANNETTE DEBO, English, Moderator

**Breaking the Gendered Binary Code:  
A Phonological and Prosodic Study of the 'Gay Voice'**

Presenter: David "Forrest" Caskey  
Sponsor: Christopher Blake

**A Room of Their Own?:  
The Rhetoric of African American Women**


Presenter: David "Forrest" Caskey  
Sponsor: Beth Huber

**White, Not Quite; Black, Get Back!: Ambivalence,  
Posturing and Signifyin(g) in the Poetry of Langston Hughes**

Presenter: Jason Hertz  
Sponsor: Annette Debo

**SCIENCES** | Mathematics and Computer Science | UC 214 | Cardinal Room  
RISTO ATANASOV, Mathematics and Computer Science, Moderator

**Modeling the Spread of Alliaria Petiolata across Different Landscape Distributions**

Presenter: Michael Lomuscio  
Sponsor: Erin McNelis  
NC-RESEARCH 

**Galois Groups of Quartic Polynomials**

Presenter: Kathleen Melhuish  
Sponsor: Risto Atanasov

**Optimal Anchoring of Wave Energy Converters**

Presenter: Murugan Vinayagam  
Sponsor: Jeffrey K. Lawson

**EDUCATION** | Human Services | UC 215 | Catamount Room  
CATHY GRIST, Human Services, Moderator

**Gender Bias in Books for Young Children: An Examination  
of Two Early Childhood Educators' Children's Literature Collections**

Presenter: Donna Harris  
Sponsor: Cathy Grist

**Are Personality and Emotional Intelligence Hidden Factors  
Contributing to Work-Family Conflict: A Theoretical Model**

Presenter: Angela Joyce  
Sponsor: Marie-Line Germain

**ENGINEERING AND TECHNOLOGY** | UC 232A | Multipurpose A  
ROBERT ADAMS, Engineering and Technology, Moderator

**Hardware Implementation of an Improved  
Voice Stress Analysis Using Empirical Mode**

Presenter: Joshua Schwartz  
Sponsor: Robert Adams

**Activity Recognition Using Hidden Markov Models and Grey Prediction**

Presenter: Kirke L. Shouse  
Sponsor: James Zhang

**Performance Analysis of UWB System**

Presenter: LakshmiNarasimhan SrinivasaRaghavan  
Sponsor: James Zhang

**Dynamic Bandwidth Allocation Based on Grey Prediction for Computer Networks**

Presenter: Mukundan Rangaswamy Vasundara  
Sponsor: Robert Adams

**SCIENCES** | Chemistry and Physics | UC 232 B | Multipurpose B  
JACK SUMMERS, Chemistry and Physics, Moderator

**Superoxide Dismutase Inhibition Screening and Characterization Using 19F NMR**

Presenter: Megan Arrington  
Sponsor: Jack Summers

**Kinetic Studies on Superoxide Dismutase**

Presenter: Jonathon Markley  
Sponsor: Jack Summers

**Boronic Acid Derivatives as Molecular Sensors**

Presenter: Terryol Wilson  
Sponsor: William Kwochka



*"Research is to see what everybody  
else has seen, and to think what  
nobody else has thought."*

Albert Szent-Gyorgyi  
(Hungarian Biochemist, 1937 Nobel Prize for Medicine,  
1893-1986)

12:30–1:45PM

**HUMANITIES** | History | UC 209 | Rogers Room  
CHARLOTTE COSNER, History, Moderator

**American Art in the Colonial/Revolutionary Period and New Republic: The Effect of American Identity on Portraiture**

Presenter: Matt Blaylock  
Sponsor: Richard Starnes

**Women in England and Colonial America: The Gender Roles that Shaped the Atlantic World**

Presenter: Megan Percy  
Sponsor: Charlotte Cosner

**HUMANITIES** | English | UC 214 | Cardinal Room  
LAURA WRIGHT, English, Moderator

**(Re)creation of History in Tiananmen Square 1989**

Presenter: Nicole Jarosinski  
Sponsor: Marsha Lee Baker

**The Pacification of the Oral Narrative in Achebe's Things Fall Apart**


Presenter: Bradford Reisinger  
Sponsor: Laura Wright

**Living in Borrowed Splendor: The Rhetoric of the 1944 Polio Epidemic in Hickory, North Carolina**

Presenter: Heather Williams  
Sponsor: Beth Huber

**FINE AND PERFORMING ARTS** | Art and Design | UC 215 | Catamount Room  
JOAN BYRD, Art and Design, Moderator

**The Sacred Vessel: Creating Reverence through Imagery and Orientation**

Presenter: Julie Fawn Boisseau  
Sponsor: Joan Byrd  
NC-RESEARCH 

**Sally Mann: Artistic Practices**

Presenter: Phyllis Jarvinen  
Sponsor: Seth McCormick

**Western Carolina University and the Jackson County Green Energy Park: Creating Ecologically Sustainable Social Entrepreneurship through the Arts in North Carolina**


Presenter: Tracy Michele Kirchmann  
Sponsor: Joan Byrd  
NC-RESEARCH 

**ENGINEERING AND TECHNOLOGY** | UC 232A | Multipurpose A  
KEN BURBANK, Engineering and Technology, Moderator

**Comparative Study of the Derivations of Polylactic Acid, between Corn Starch and Sugar Cane**

Presenter: Michael Scott Conner  
Sponsor: William McDaniel

**Development of an Automated Putty Injection Process**


Presenter: Joshua L. Ellis  
Sponsor: Aaron Ball  
NC-RESEARCH 

**High Temperature Solar Water Heating**

Presenter: William Kuykendall  
Sponsor: Phil Sanger

**SOCIAL SCIENCES** | Public Affairs | UC 232 B | Multipurpose B  
CHRISTOPHER COOPER, Political Science and Public Affairs, Moderator

**Incorporation vs. Annexation**

Presenter: Charlie Foxx  
Sponsor: Christopher Cooper  
NC-RESEARCH 


**The Town of Sylva: Parking Planning in Downtown**

Presenter: Thaddeus N. Huff  
Sponsor: Christopher Cooper

**An Analysis of Permanent Outcomes for Abused, Neglected and Dependent Children in Buncombe County, North Carolina**

Presenter: Jennifer E. Nehlsen  
Sponsor: Gibbs Knotts

**NC STEP Grant**

Presenter: Brianna Rogers  
Sponsor: Christopher Cooper  
NC-RESEARCH 



*“If we knew what it was we were doing, it would not be called research, would it?”*

Albert Einstein  
(Theoretical physicist, 1879–1955)

**HEALTH** | Communication Sciences and Disorders | UC 315 | Theater  
 GEORGIA HAMBRECHT, Communication Sciences and Disorders, Moderator

**Community Service Learning: A Collaborative Effort to Support and Extend our Graduate School Experience**

**Presenters:** Lauren Rhein, Nicole McRight, Tyra Minton, Jordan Simmons, Michael Taylor, Rhian Vanderburg, and Caroline Workman  
**Sponsors:** Georgia Hambrecht and Bill Ogletree

**2-3:15PM**

**HUMANITIES** | English | UC 209 | Rogers Room  
 BRENT KINSER, English, Moderator

**Paths of National Redemption: J.M. Coetzee and Keri Hulme in Conversation**


**Presenter:** Jason Hertz  
**Sponsor:** Laura Wright

**Truth, Fiction, Reconciliation, and Social Change**

**Presenter:** Joy Neaves  
**Sponsor:** Laura Wright

**SCIENCES** | Biology | UC 214 | Cardinal Room  
 LAURA DEWALD, Biology, Moderator

**Patterns of Recruitment and Culm Morphology in *Arundinaria Gigantea* ([Walt.] Muhl.) Canebrakes in Western North Carolina**

**Presenter:** Keith Hoffman  
**Sponsor:** Laura DeWald  
 NC-RESEARCH 

**Great Laurel (*Rhododendron Maximum*) Effects on Microhabitat Use and Abundances of Southern Appalachian Salamanders**

**Presenter:** Kyle K. Pursel  
**Sponsor:** Joseph Pechmann

**FINE AND PERFORMING ARTS** | Music | UC 215 | Catamount Room  
 JASON SOLOMON, Music, Moderator

**Music Theory as Theology**

**Presenter:** Michael Collings  
**Sponsor:** Jason Solomon

**The Perception of Music's Influence on Human Emotion and Behavior**

**Presenter:** Judith Gilbert  
**Sponsor:** Jason Solomon

**Defining Musical Gesture**

**Presenter:** Cynthia Smith  
**Sponsor:** Jason Solomon



*“Research is formalized curiosity.  
 It is poking and prying with a purpose.”*

Zora Neale Hurston  
 (American Novelist and Playwright, 1903–1960)

**ENGINEERING AND TECHNOLOGY** | UC 232A | Multipurpose A  
PETER TAY, Engineering and Technology, Moderator

**A Feasibility Study of Two Alternate Proton Radiation Compensator Designs for Use in Proton Radiation Therapy**

Presenter: Johnathan Tyler Bennett  
Sponsor: Chip Ferguson

**A Novel Shape Feature to Classify Microcalcifications**

Presenter: Yiming Ma  
Sponsor: Peter Tay

**The Automated Loading and Detection of Radioactive Seeds for Use in Brachytherapy Prostate Treatments**

Presenter: Jason A. Proffitt  
Sponsor: Aaron Ball

**ENGINEERING AND TECHNOLOGY** | UC 232 B | Multipurpose B  
BILL YANG, Engineering and Technology, Moderator

**Optical Assembly of Far-Field Super-Resolution Imaging via Optical Gain**

Presenter: Joshua S. Deaver  
Sponsor: Bill Yang

**Facial Expression Recognition Using Fast BEMD Based Edge Detection**

Presenter: Zijong Qin  
Sponsor: James Zhang

**A Comparison for the Accuracy of a Three Dimensional Point Cloud Generated from Parts Scanned Using the ATOS White Light Interferometers**

Presenter: Christopher W. Rhoades  
Sponsor: Chip Ferguson

**HEALTH** | Physical Therapy | UC 315 | Theater  
DAVID HUDSON, Physical Therapy, Moderator

**Effectiveness of a Community-Based Balance Exercise Program in Older Adults**

Presenters: Heather Barnard, Melissa Berry, Jodie Johnson, Lori Peek, and Melia Pinnix  
Sponsor: Lori Schrodt

**Clinical Anatomy Workshops: Physical Therapy Students Provide Service Learning for Physical Therapist Assistant Students**

Presenters: Zachary Githens, Andrea Klocko, Megan Lukey, and Marion Macy  
Sponsors: Kathy Starr and Elisa Zuber

**Western Athletic Knee Scale (WAKS) 2010: Reliability of an Assessment Tool for Knee Injuries in the General and Athletic/Active Populations**

Presenters: Elizabeth Heltz, Tamara May, Amanda Roach, and Emily Walgate  
Sponsor: James Scifers

**3:30–4:45 PM**

**HUMANITIES** | History | UC 209 | Rogers Room  
ALEXANDER MACAULAY, History, Moderator

**The Hammer of Truth: A Tool for Jefferson's Use**

Presenter: Terri Downing  
Sponsor: Richard Starnes

**The Leader and His Programs: President Franklin D. Roosevelt and the New Deal in the South, 1927-1939**

Presenter: Brittany L. Keating  
Sponsor: Gael Graham

**Three Days at Paris: Outmoded British Government and the Bristol Riots of 1831**

Presenter: James McKee  
Sponsor: Alexander Macaulay

**BUSINESS** | Accounting | UC 214 | Cardinal Room  
ROGER LIRELY, Accounting, Finance, Information Systems, and Economics, Moderator

**The Tax Consequences of LIFO Abandonment due to the Adoption of IFRS**

Presenter: Rob Heyer  
Sponsor: Roger Lirely

**An Empirical Examination of the Usefulness of Peer-Assessed Research Presentations**

Presenter: Courtney D. Vanhook  
Sponsors: Debashish Bannerjee and Roger Lirely



*“The most exciting phrase to hear in science, the one that heralds new discoveries, is not ‘Eureka!’ but rather ‘hmm...that’s funny.’”*

Isaac Asimov  
(American Novelist and Biochemist, 1920-1992)

**HUMANITIES** | English | UC 215 | Catamount Room  
ELIZABETH HEFFELFINGER, English, Moderator

**Adventures in Postcolonial Photojournalism: The Spiti Situation**

Presenter: Ethan Burns  
Sponsor: Laura Wright

**A Most Recalcitrant Patriot: Oscar Wilde's Irish Vision of Socialism**

Presenter: Jennifer R. Doyle-Corn  
Sponsor: Brent Kinser

**The Difference of One Sun's Rise: Conflicting Time in Sindiwe Magona's Mother to Mother**

Presenter: Heather Williams  
Sponsor: Beth Huber

**ENGINEERING AND TECHNOLOGY** | UC 232A | Multipurpose A  
BRIAN HOWELL, Engineering and Technology, Moderator

**Algorithmic Optimization for Propulsion in Station Keeping of a Marine Vehicle**

Presenter: Josh Brede  
Sponsor: Brian Howell

**Fluorescence Spectroscopy**

Presenter: Justin Bullins  
Sponsor: Brian Howell

**The Optimization of Swarm Robotic Constellation Communication for Object Detection and Event Recognition**

Presenter: Matthew Ryan Proffitt  
Sponsor: Brian Howell

**Multi-Sensory Object Recognition in Lake or Estuary Environments**

Presenter: A.J. Punch  
Sponsor: Brian Howell

**EDUCATION** | Educational Leadership & Foundations, Human Services  
UC 232 B | Multipurpose B  
SHARON DOLE, Human Services, Moderator

**How Do Gifted Students Exhibit Leadership Traits?**

Presenter: Debra Dearman  
Sponsors: Lisa Bloom and Sharon Dole

**Artistic Insubordination**

Presenter: Eric Pitts  
Sponsor: Frederick Buskey

**HEALTH** | Physical Therapy | UC 315 | Theater  
DAVID HUDSON, Physical Therapy, Moderator

**The Effects of Hiking Poles on Plantar Surface Pressure**

Presenters: Katherine Bumgarner and Sarah Miller  
Sponsor: David Hudson

**The Relationship among Arch Measurements and Plantar Pressure of the Foot**

Presenters: Daryl MacInnes and Michael Hudson  
Sponsor: David Hudson

**A Methodological Study Exploring Pre and Post Intervention Variability of Healthy Adults' Transversus Abdominis Contractions during Functional Tasks**

Presenters: Stacy Sannem, Ali Clark, and Josh Clark  
Sponsors: Sue McPherson and Todd Watson

**5–6:15PM**

**RECEPTION AND AWARDS** | Grand Room

Please join us for a brief reception in honor of graduate students, their mentors, and the graduate programs at Western Carolina University.

The Graduate Teaching Assistant Award, Karen Nicholson Thesis Award, North Carolina Research Recognition Award, and Research Awards in Business, Education, Fine and Performing Arts, Health, Humanities, Sciences and Technology, and Social Sciences will be presented at this reception.

The Symposium continues at 6:30pm, so we will begin promptly at 5:00pm. Light refreshments and hors d'oeuvres will be available.

**6:30–8:00PM**

**SOCIAL SCIENCES** | Public Affairs | UC 232A | Multipurpose A  
GIBBS KNOTTS, Political Science and Public Affairs, Moderator

**H.R. Capstone Project**


Presenter: Thomas Allen  
Sponsor: Christopher Cooper



*“Somewhere, something incredible is waiting to be known.”*

Carl Sagan  
(American Astronomer, 1978 Pulitzer Prize for General Non-Fiction, 1934-1996)

### Latinos and Access to Higher Education: A Resource Guide for Students and their Families


Presenter: Sarah Nunez  
Sponsor: Christopher Cooper  
NC-RESEARCH 

### Proposed Homeless Recruitment Plan for Buncombe and Madison County Head Start

Presenter: Sarah Shepelwich  
Sponsor: Christopher Cooper

### ART, BIOLOGY, ENGLISH, AND NURSING | UC 232 B | Multipurpose B CHRIS COBURN, Biology, Moderator

#### The Art of Kudzu

Presenter: Jan Parker  
Sponsor: Marya Roland  
NC-RESEARCH 

#### Application of a DNazyme to Probe RNA Secondary Structure

Presenter: Donald Patterson  
Sponsor: Chris Coburn

#### Wulfert Road and the Alligators: Turning Fear into Respect for Sanibel Island's Natural Ecology

Presenter: Paula Bolado  
Sponsor: Deidre Elliott

#### Blended vs. Lecture Learning: Outcomes for Staff Development

Presenter: Heidi Sherman  
Sponsor: Linda Comer

### THE FOLLOWING STUDENTS PRESENTED THEIR RESEARCH AT A PSYCHOLOGY SESSION HELD ON MONDAY, MARCH 8, 2010:

#### The Effects of Sex and Relationship Status on Body Image

Presenter: Ashley Bridges  
Sponsor: Millie Abel

#### First Person Descriptions of the Experiences of School-Aged Females with Attention-Deficit/Hyperactivity Disorder and their Teachers

Presenter: Blair Burke  
Sponsor: John Habel

#### To Climb or Not to Climb: Increasing Self-Efficacy in College Freshmen

Presenter: Susan Denny  
Sponsor: Windy Gordon

#### Effects of Location and Gender of Joke Teller on Sexist Humor Ratings

Presenter: Jared Gray  
Sponsor: Millie Abel

#### Comparing Clinical Measures of Depression to the Five-Factor Model of Personality

Presenter: Adam Hicks  
Sponsor: David McCordl

#### Perceptions toward Civil Commitment of Sex Offenders

Presenter: Alicia Isenberg  
Sponsor: Alvin Malesky

#### Personality and Public Policy Opinion

Presenter: Andrew Johnson  
Sponsor: David McCord

#### Personality Differences and the Effectiveness of Pediatric Camp Counselors

Presenter: Sara Soyars  
Sponsor: David McCord

#### Codpendence or CORI: Core Origin and Relationship Issues

Presenter: Ashton Southard  
Sponsor: Norman Hoffman

#### The Effects of Social Support and Perceived Stress on Body Image: Does Emotion Regulation also Play a Role?

Presenter: Audra Wagaman  
Sponsor: Kia Asberg

#### North Carolina Research Recognition

*Special Recognition and Award for research related to the economic, cultural, and artistic development of the State of North Carolina.*





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