

Western Carolina UNIVERSITY

Presents
The Nineteenth Annual

Undergraduate EXPO

2017 In conjunction with the Office of the Provost,
The Honors College and Graduate School and Research
Sponsored By Phenix Research Products and Sigma Xi

March 29-30

*Part of Western Carolina University's
Research and Scholarship Celebration*

Schedule At-A-Glance

Wednesday 3.29.17

Ramsey Arena

- | | |
|----------------|---|
| 3:00 PM | Poster Preview |
| 4:00 PM | Opening Remarks: Brandon E. Schwab,
Associate Provost for Academic Affairs |
| 4:05 – 4:55 PM | Faculty Panel and Q&A on “Inspiring Inquiry:
Alternative Ways of Knowing and Doing” |
| 5:00 – 6:00 PM | Keynote Speaker: Marie T. Cochran, “When
There's More to the Story: Affrilachia and
Beyond” |
| 6:00 – 7:30 PM | Undergraduate & Graduate Posters
Reception & Celebration |

Across Cullowhee Campus

- | | |
|---------|---------------------------------------|
| All Day | Oral Undergraduate Expo Presentations |
|---------|---------------------------------------|

Thursday 3.30.17

University Center

- | | |
|-------------------|--|
| 9:30 AM – 6:30 PM | Graduate Research Symposium with
Exemplary Undergraduate Research Featured
Presentations |
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Across Cullowhee Campus

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|---------|---------------------------------------|
| All Day | Oral Undergraduate Expo Presentations |
|---------|---------------------------------------|

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Welcome

Welcome to the 2017 WCU Research and Scholarship Celebration. RASC 2017 is a collaboration between The Honors College, Graduate School & Research, and Office of the Provost that brings together the Graduate Symposium and the Undergraduate Expo to highlight scholarship and creative activities across the university in a two-day event.

On Wednesday, March 29, the RASC includes 21 undergraduate oral presentations at various campus locations throughout the day. At 3:00 pm, the RASC poster session preview begins in the Ramsey Center arena. The session includes 64 undergraduate poster presentations along with 24 research posters presented by graduate students. In addition, the Center for Service Learning is showcasing 10 STAR Engagement Award winners. Other highlights include a panel discussion on research by WCU faculty and a keynote address by Marie Cochran, Artist and Founding Curator of the Affrilachian Artist Project.

On Thursday, March 30, 44 oral presentations by graduate students take place 9:30-4:45 in the University Center. Along with the graduate student presentations, 11 talks from featured undergraduate students are part of the oral presentations in the UC.

We are glad you are part of RASC 2017. The presentations shared over the two day event not only represent countless hours of student effort, but also would not be possible without the tireless efforts of more than 52 faculty sponsors across more than 18 departments and programs. Thanks to all of the faculty, staff, and students, as well as our sponsors, who worked to make this event possible. Enjoy!

Sincerely,

Dr. Brandon E. Schwab
Associate Provost for Academic Affairs

Welcome to our Keynote Speaker, Marie T. Cochran! Ms. Cochran will be speaking in the Ramsey Center at 5:00 on Wednesday, March 29 on “When There's More to the Story: Affrilachia and Beyond.”

RASC Keynote Speaker

Marie T. Cochran



MARIE COCHRAN received degrees from the University of Georgia (BFA) and the School of the Art Institute in Chicago (MFA). Through her work as a visual artist, educator and curator, Cochran uses art to convene community partners for conversation and collaboration that continues throughout the process of creation. A key feature of her work involves primary source material --- including historical documents, archival photographs and oral history interviews.

Cochran received Story Circle Training during her participation in the Color Line Project led by John O’Neil, founder of the Free Southern Theatre. She has also participated in the planning and programming for the *Smithsonian’s Museum on Main Street* traveling exhibits, *Journey Stories* (Sylva, NC) and *New Harmonies: Celebrating American Roots Music* (Toccoa, GA).

Selected exhibition venues include the High Museum of Art, Atlanta, GA; Lyndon Johnson Presidential Library & Museum, Austin, TX; the former Center for African American History and Culture, Smithsonian Institute, Washington, DC; and the Studio Museum of Harlem, NYC. Cochran’s art awards include a Georgia Council for the Arts Individual Artist’s Grant, Artist as Catalyst grant from the Mid-Atlantic Arts Council /Southern Arts Federation Fellowship, NEA Fast-Track Challenge Grant and support from the We Shall Overcome Fund sponsored by the Highlander Center.

She has been an artist-in-residence at a wide range of organizations including youth programs and historical sites. Cochran, artist and founder of the Affrilachian Artist Project will talk about the inspiration for this documentary initiative, the role of creativity in the field of research and the importance of Citizen Scholars.

Most recently, Cochran reconvened artists for the Annual African American Women's Conference at the University of Kentucky.

Featured Undergraduate Speakers

These featured undergraduate speakers will be participating in the Graduate Research Symposium on Thursday, March 30. These students were selected through the abstract review process for RASC. They are listed here in alphabetical order by the last name of the primary author. The schedule for their presentations can be found on page 5 of this program. Congratulations to these exceptional students and to their faculty mentors!

Determining the Best Practices to Defend the Financial Services Sector through Undergraduate Research

Student Presenter: Madison Benton

Faculty Sponsor: Thomas Johnson

Discovery, Characterization and Comparison of Potential A1 Bacteriophages Punchy, Cherub, StarDust, FireFlyEcho, and Crispicous1

Student Presenters: Courtney Buchanan, Emily Weatherman, Jennifer Burns, Michelle Norton

Faculty Sponsors: Maria Gainey, Jamie Wallen, Megan Eckardt

Research Study Conducted on the Jackson County Greenway

Student Presenters: Mallary Caraway, Thomas Hyatt, Rob Duplak

Faculty Sponsor: Ben Tholkes

Designer's Tote Bag

Student Presenters: Vincent Cuffee II, Tuyen Tram

Faculty Sponsor: Betty Torrell

Evaluating Recycling in Two Classroom Buildings at Western Carolina University

Student Presenters: Isaac Hayes, Pasquale Scotto DiClemente, Danielle Green, Anthony Galavotti

Faculty Sponsor: Laura DeWald

Creation and Characterization of a Fluorescently-tagged Proteasomal Cell Line for Use in Protein Aggregation Studies

Student Presenter: LaMoyne Ebert

Faculty Sponsor: Robert Youker

Evidence Analysis of the Effects of the Paleolithic Diet on Body Composition and Blood Lipids in the Healthy Population

Student Presenters: Lauren Ginocchio, Sam Pattillo

Faculty Sponsor: Brenda Marques

Oral Magnesium Supplementation for the Treatment of Cardiovascular Disease: An Evidence Analysis

Student Presenter: Katelyn Mayberry

Faculty Sponsor: Brenda Marques

Characterization of Amino Acids Critical to Alpha-Glycerophosphate Oxidase Catalysis

Student Presenter: Alma Plaza-Rodriguez, Aric Butler, C.M. Crowley

Faculty Sponsor: Jamie Wallen

The Journey of Electricity with Medicine: A Historical Perspective

Student Presenter: Rachel Stamey

Faculty Sponsor: Vicki Szabo

Hope for the Homeless

Student Presenters: Megan Burnette, Kelsey Vaughn, Savannah Henderson

Faculty Sponsor: Elizabeth Sexton

Please join us for a lively discussion on “Inspiring Inquiry: Alternative ways of knowing and doing” to be held on Wednesday, March 29 at 4:00 in the Ramsey Center, just before the Keynote Speaker. Thanks to these faculty scholars for sharing insights into their work and how their scholarship is shaped by their disciplinary perspectives.

Featured Faculty Panelists

Channa De Silva, Associate Professor, Department of Chemistry & Physics

Heather Mae Erickson, Assistant Professor, School of Art & Design

Steve Morse, Associate Professor, School of Marketing, Entrepreneurship, Sport Management, and Hospitality & Tourism

Honor Sachs, Assistant Professor, Department of History

Martin Tanaka, Associate Professor, School of Engineering & Technology

Moderator: Lane Perry, Director, Center for Service Learning

Featured Undergraduate Speakers Presentations At-A-Glance

Thursday, March 30

Time	Presenter	Faculty Sponsor	Title	Location
9:30- 9:45 AM	Isaac Hayes, Anthony Galavotti, Pasquale Scotto Diclemente, Danielle Green	Laura DeWald	Evaluating Recycling in Two Classroom Buildings at Western Carolina University	UC Catamount Room
9:30- 9:45 AM	Mallary Caraway, Thomas Hyatt, Rob Duplak	Ben Tholkes	Research Study Conducted on the Jackson County Greenway	UC Multipurpose Room
12:30- 12:45 PM	Madison Benton	Thomas Johnson	Determining the Best Practices to Defend the Financial Services Sector through Undergraduate Research	UC Multipurpose Room
12:30- 12:45 PM	Lauren Ginocchio, Sam Pattillo	Brenda Marques	Evidence Analysis of the Effects of the Paleolithic Diet on Body Composition and Blood Lipids in the Healthy Population	UC Catamount Room
12:45- 1:00 PM	Katelyn Mayberry	Brenda Marques	Oral Magnesium Supplementation for the treatment of Cardiovascular Disease: An Evidence Analysis	UC Catamount Room
12:30- 12:45 PM	Vincent Cuffee II, Tuyen Tram	Betty Torrell	Designer's Tote Bag	UC Dogwood Room
2:00-2:15 PM	Alma Plaza-Rodriguez, Aric Butler, C.M. Crowley	Jamie Wallen	Characterization of Amino Acids Critical to Alpha-Glycerophosphate Oxidase Catalysis	UC Catamount Room
2:00-2:15 PM	LaMoynes Ebert	Robert Youker	Creation and Characterization of a Fluorescently-tagged Proteasomal Cell Line for use in Protein Aggregation Studies	UC Multipurpose Room
2:00-2:15 PM	Courtney Buchanan, Emily Weatherman, Jennifer Burns, Michelle Norton	Maria Gainey, Jamie Wallen, Megan Eckhardt	Discovery, characterization and comparison of potential A1 bacteriophages Punchy, Cherub, StarDust, FireFlyEcho, and Crispicus1	UC Multipurpose Room
2:15-2:30 PM	Megan Burnette, Kelsey Vaughn, Savannah Henderson	Elizabeth Sexton	Hope for the Homeless	UC Catamount Room
3:30-3:45 PM	Rachel Stamey	Vicki Szabo	The Journey of Electricity with Medicine: A Historical Perspective	UC Dogwood Room

Undergraduate Expo Oral Presentations At-A-Glance

Wednesday, March 29

Time	Presenter	Faculty Sponsor	Title	Location
11:15 AM	Mitchell Parris	Debby Singleton	Creating a Successful Business Plan for a Shooting Range	Killian Building 304
11:30 AM	Mallary Caraway, Thomas Hyatt, Rob Duplak	Ben Tholkes	Research Study Conducted on the Jackson County Greenway	Killian Building 304
11:45 AM	Noah Jones, Mitchell Parris, Elizabeth May	Ben Tholkes	Pantherstown Valley: An Analysis of Trail Use and Users	Killian Building 304
1:00 PM	Mitchell Joseph, Marcia Laslo, Alexis Ross, Kaitlyn McAllister	Cheryl Clark, Elizabeth Sexton	Community Health Education and Prevention Strategies for Senior Citizens in Rural Western North Carolina	Health & Human Sciences Building 204
1:10 PM	Janice Hill, Branson Taylor McMullen, Kaci Stepp	Elizabeth Sexton, Cheryl Clark	Veterans Restoration Quarters: Training Veterans as Soldiers for Personal Health Promotion	Health & Human Sciences Building 204
1:25 PM	Brandon Kassab	Christina Reitz	Shostakovich's Tenth Symphony and Germanic Musical Nomenclature	UC Theater
1:25 PM	Maggie Pazur	Christina Reitz	Exoticism in 18th Century Opera: Appropriation v. Appreciation	UC Theater
1:30 PM	Megan Burnette, Kelsey Vaughn, Savannah Henderson	Elizabeth Sexton	Hope for the Homeless	Health & Human Sciences Building 204
1:50 PM	Rachael Johnson, Arianna Gonzalez	Cheryl Clark	Food for Thought, A Service Learning Project at Open Door	Health & Human Sciences Building 204
2:30 PM	Taylor Thomas, Leigh Miller	Cheryl Clark, Elizabeth Sexton	Syringe Exchange of Franklin: a Journey into Harm Reduction	Health & Human Sciences Building 204

2:50 PM	Courtney Ball, Adam Lunsford, Sarah McQueen	Elizabeth Sexton, Cheryl Clark	AHOPE: Educating and Advocating for the Homeless Population	Health & Human Sciences Building 204
3:00 PM	Alli Rios	Paul Worley	Maya Arts as Maya Literature: Maya Textiles and Storytelling Traditions in Mexico and Western NC	Coulter Building 409
3:10 PM	Alice Thompson, Alexandra Pate, Rickey Haggitt, Marykate Hodor	Cheryl Clark, Elizabeth Sexton	Teaching Health Education and Management to the Homeless in Haywood County	Health & Human Sciences Building 204
3:30 PM	Cyprus Pierceall	Mary Engel	Omar Ibn Sayyid, Muslim Slave or Converted Christian?	McKee Building 209
3:30 PM	Manuel Zenquis	Munene Mwaniki	The Intersection of Race, Gender, and Nationality in Sport: A Western-Centric Depiction of the Ogwumike Sisters	McKee Building 114
3:50 PM	Carrie Doster, William Nabors, Tess Schneider	Elizabeth Sexton	What to do, Where to go: Harm Reduction and How Infections Show	Health & Human Sciences Building 204
4:00 PM	Rachel Stamey	Vicki Szabo	The Journey of Electricity with Medicine: A Historical Perspective	McKee Building 209

Thursday, March 30

Time	Presenter	Faculty Sponsor	Title	Location
11:30 AM	Abigail Powers	Brian Railsback	The Foci Of Race and Religion Amongst Authors William Apess, Mary Rowlandson, and Zitkala Ša	Coulter Building
1:45 PM	Vincent Cuffee II, Tuyen Tram	Betty Torrell	Designer's Tote Bag	Belk Building 308B
2:00 PM	Natalie Browne	Richard Starnes	The North Carolina Campaign Against Hookworm Disease: Digging a Little Deeper into the Case of the American Murderer	McKee Building 223
Time Not Listed	Lisa Schiller	Brian Railsback	Formalism & American Literature	Coulter Building

Undergraduate Expo Poster and Oral Presentations

Poster presentations will be held at Western Carolina University, March 29 at Ramsey Arena, 6:00-7:30 PM. Oral presentations will be held across campus March 29 & 30 at various times. Below are project titles, presenters, and sponsors by College and Department.

* Denotes oral presentation. All others are posters.

College of Arts & Sciences

Anthropology and Sociology

*The Intersection of Race, Gender, and Nationality in Sport: A Western-Centric Depiction of the Ogwumike Sisters **

Manuel Zenquis, presenter
Munene Mwaniki, sponsor

An Anthropological Study of the Deep History of Cherokee Public Spaces

Enzo Petrozza, presenter
Benjamin Steere, sponsor

Pibloktoq (Arctic Hysteria) and Culture-Bound Syndromes

Gianna White, presenter
Benjamin Steere, sponsor

Biology

Bioinformatic Analysis of Holin and Lysin Proteins in Mycobacteriophages Discovered in Western North Carolina

CC Billings, Savannah Wood, presenters
Jamie Wallen, Maria Gainey, Megan Eckardt, sponsors

Examining the Biodiversity of Locally Discovered Mycobacteriophages via Genome Analysis and Annotation

Cayley Johnson, Sabrina Curtis, Audra Bovender, Jillian Brown, presenters
Maria Gainey, Jamie Wallen, Megan Eckardt, sponsors

A Closer Look into the Morphological and Genotypic Differences between Mycobacteriophages Discovered in Western North Carolina

Dylan Rood, Henry Salvo, Chelsea Jones, Alexis Moore, presenters
Maria Gainey, Jamie Wallen, Megan Eckardt, sponsors

Discovery and Comparison of Locally Isolated Bacteriophages and their Tails

Sydney Winchel, Jessalyn Killilee, Delaney Kelnhofer, Alexander Cash, presenters
Maria Gainey, Megan Eckardt, Jamie Wallen, sponsors

Localization of Tps1 and Tps2 Proteins in the Pathogenic Yeast, Cryptococcus Neoformans

Erin Cafferty, presenter
Indrani Bose, sponsor

Creation and Characterization of a Fluorescently-tagged Proteasomal Cell Line for use in Protein Aggregation Studies

LaMoyne Ebert, presenter
Robert Youker, sponsor

Distinct Spatial Organization for Two Misfolded Proteins during Aggresome Biogenesis in HEK293 Cells

Jordan Nelson, presenter
Robert Youker, sponsor

Chemistry and Physics

Investigation of Uncharacterized Regions in DNA Polymerase Gamma of Cryptococcus Neoformans

Lindsey Farris, ReLiza McGinnis, presenters
Jamie Wallen, Indrani Bose, Joshua Boggs, sponsors

Discovery, Characterization and Comparison of Potential A1 Bacteriophages Punchy, Cherub, StarDust, FireFlyEcho, and Crispicous1

Courtney Buchanan, Emily Weatherman, Jennifer Burns, Michelle Norton, presenters
Maria Gainey, Jamie Wallen, Megan Eckardt, sponsors

Synthesis, Characterization, and Antimicrobial Studies of Chemically Modified Textile Materials using Zinc Oxide Nanoparticles for Potential Prevention of Healthcare-Associated Infections

Monica Reece, Nicole A. Dragan, Hannah N. Kline, Stephen Printz, presenters
Carmen Huffman, Indrani Bose, Channa De Silva, sponsors

Luminescent Studies of Europium Metal Ion-Doped NaYF₄ Nanoparticles

Paige Phillips, Laney Browder, presenters
Channa De Silva, sponsor

Synthesis of Time-Resolved Fluorescence Probes for the Future Detection and Improved Study of Cancer

Alyssa Frediani, presenter
Brian Dinkelmeyer, sponsor

Characterization of Amino Acids Critical to Alpha-Glycerophosphate Oxidase Catalysis

Alma Plaza-Rodriguez, Aric Butler, C.M. Crowley, presenters
Jamie Wallen, sponsor

Validation of Interactions Observed Between the C-Terminal tail of the T7 Primase-Helicase and DNA Polymerase During Replisome Assembly

Kasie Stephens, Matthew McDonough, presenters
Jamie Wallen, sponsor

Communication

The Exploration of Communication Apprehension among College Students

Colin Croat, presenter
Candy Noltensmeyer, Suzon Hawley, sponsors

Communicating Social Support

Kayla Harasymchuk, presenter
Candy Noltensmeyer, David Scales, sponsors

Criminology and Criminal Justice

The Effects of Formal and Informal Deterrence on Certain Minor Offenses

Gabrielle Davis, presenter
Steven Brown, sponsor

Black Lives Matter on the WCU Campus

Steven Lawson, presenter
Cyndy Caravelis, sponsor

Sexual Assault and College Athletes; What WCU's Athletic Enhancement Program Can do to Prevent it

Emily Gerulis, presenter
Cyndy Caravelis, sponsor

Determining the Best Practices to Defend the Financial Services Sector through Undergraduate Research

Madison Benton, presenter
Thomas Johnson, sponsor

An Assessment of Piedmont Natural Gas Inclusion of ESF 12 Energy Best Practices

Travis Ellington, presenter
Thomas Johnson, sponsor
Community Table Actions After a Disaster
Steven Lawson, presenter
Thomas Johnson, sponsor

English

*The Foci Of Race and Religion Amongst Authors William Apess, Mary Rowlandson, and Zitkala Ša **

Abigail Powers, presenter
Brian Railsback, sponsor

*Formalism & American Literature **

Lisa Schiller, presenter
Brian Railsback, sponsor

*Maya Arts as Maya Literature: Maya Textiles and Storytelling Traditions in Mexico and Western NC **

Alli Rios, presenter
Paul Worley, sponsor

Geosciences and Natural Resources

Evaluating Recycling in Two Classroom Buildings at Western Carolina University

Pasquale Scotto DiClemente, Isaac Hayes, Danielle Green, Anthony Galavotti, presenters
Laura DeWald, sponsor

Variations of Olivine Compositions with Distance from a Hydrous Vein
Sean Price, Sierra Ramsey, presenters
Amy Fagan, sponsor

Electron Microprobe Analysis of Lunar Meteorite Sample NWA 8632
Sierra Ramsey, presenter
Amy Fagan, sponsor

History

*Omar Ibn Sayyid, Muslim Slave or Converted Christian? **
Cyprus Pierceall, presenter
Mary Engel, sponsor

Baseball and the Culture of Conformity at the Dawn of the Cold War
Darren Beebe, presenter
Robert Ferguson, sponsor

A Lack of Preparedness, a Misdiagnosis, and a Nation Grappling for Answers: The United States' Plummet into the Korean War
Darren Beebe, presenter
Gael Graham, sponsor

*The North Carolina Campaign Against Hookworm Disease: Digging a Little Deeper into the Case of the American Murderer **
Richard Starnes, sponsor

Natalie Browne, presenter
*The Journey of Electricity with Medicine: A Historical Perspective **
Rachel Stamey, presenter
Vicki Szabo, sponsor

Mathematics and Computer Science

Smartphone Application to Improve Library Utilization
Trevor Grabko, Austin Richburg, presenters
Andrew Scott, William Krehling, sponsors

Virtual RealiTeach
Anthony Benavente, Daniel Powell, presenters
William Krehling, Andrew Scott, sponsors

Political Science & Public Affairs

Racial Disparities between Rural and Urban Police Traffic Stop Searches
Bryan Gress-Byrd, presenter
Todd Collins, sponsor

College of Business

School of Accounting, Finance, Information Systems and Business Law

Financial Literacy Among College Students
Emily Ranson, presenter
Grace Allen, Patrick Payne, sponsors

College of Education and Allied Professions

Human Services

*Creating a Successful Business Plan for a Shooting Range **

Mitchell Parris, presenter
Debby Singleton, sponsor

*Research Study Conducted on the Jackson County Greenway **

Mallary Caraway, Thomas Hyatt, Rob Duplak, presenters
Ben Tholkes, sponsor

*Panthertown Valley: An Analysis of Trail Use and Users **

Noah Jones, Mitchell Parris, Elizabeth May, presenters
Ben Tholkes, sponsor

Psychology

Narratives of Asexuality

Amanda Muse, presenter
Candace Boan-Lenzo, Mickey Randolph, sponsors

Development of The Minnesota Behavioral Health Screen (MBHS): An Efficient Multidimensional Depression Measure

Katherine Hutchinson, presenter
David McCord, sponsor

College of Engineering and Technology

School of Engineering and Technology

Ceramic Property Comparison of Silicon Carbide and Boron Nitride

Amia Jones, presenter
Chip Ferguson, Sudhir Kaul, sponsors

The Fabrication and Characterization of Ionic Wind Propulsion Devices

Dustin Burgess, Marshall Murphy, presenter
Michael S. June, sponsor

The Assessment of Energy Usage in the Health and Human Sciences Building

Brandon Jordan, presenter
Bora Karayaka, sponsor

MR Fluids

James Bishop, presenter
Sudhir Kaul, sponsor

Double Wishbone Suspension System

Jordan Hardwick, presenter
Sudhir Kaul, sponsor

Mini Baja Drivetrain Design
James Walker, presenter
Sudhir Kaul, sponsor

Working with Wearables: Wearables in the Workplace
Emanuel Benitez, presenter
Peter Tay, sponsor

A Study on Control Strategies in Swarm Robotics
Matthew Hill, presenter
Yanjun Yan, sponsor

Using Swarm Robotics in and out of the Classrooms
William Honeycutt, Jason LaQuerre,
Brandon Letchworth, presenters
Yanjun Yan, sponsor

College of Fine and Performing Arts

School of Art and Design

Cherokee Word Games
Hannah Faub, presenter
Mary Anna LaFratta, sponsor

*Designer's Tote Bag **
Vincent Cuffee II, Tuyen Tram, presenters
Betty Torrell, sponsor

School of Music

*Shostakovich's Tenth Symphony and Germanic Musical Nomenclature **
Brandon Kassab, presenter
Christina Reitz, sponsor

*Exoticism in 18th Century Opera: Appropriation v. Appreciation **
Maggie Pazur, presenter
Christina Reitz, sponsor

College of Health and Human Sciences

Communication Sciences and Disorders

Productive and Perceptive Understanding of Heteronyms in ESL Students
Leah Bush, presenter
Georgia Hambrecht, sponsor

School of Health Sciences

Food Security and Stress Levels Among College Students
Farrah Matthews, presenter
Elizabeth Wall-Bassett, Yanju Li, sponsors

Novel Insights into the Taxonomic Status of Anopheles Punctipennis and Anopheles Perplexens using Morphological and Molecular Characteristics

Kendra Person, presenter
Brian Byrd, sponsor

Does Turmeric Provide Relief for Arthritis Patients?

Mallie Billing, presenter
Brenda Marques, sponsor

Iron Supplementation and Cognition in Adult Women

Alyssa Buff, presenter
Brenda Marques, sponsor

Sensory Analysis of High Protein Shake
Daniel Calvillo, Benjamin Hungerford,
presenters

Brenda Marques, sponsor

Nutritional Value of Meals Provided in a Community Meal Distribution Program

Ashley Cox, presenter
Brenda Marques, sponsor

Vitamin D and Calcium Supplementation in Improving Bone Mineral Density and Bone Health of Individuals with Osteoporosis: An Evidence Analysis

Laura Dunn, presenter
Brenda Marques, sponsor

Evidence Analysis of the Effects of the Paleolithic Diet on Body Composition and Blood Lipids in the Healthy Population

Lauren Ginocchio, Sam Pattillo,
presenters
Brenda Marques, sponsor

Sensory Evaluation of Pasta Alternatives

Katelyn Haney, Rachel McClure,
Madison Rusher, presenters
Brenda Marques, sponsor

Sensory Analysis of an Alternative Pizza Crust

Kaitlan Helms, KeShon Andrews,
Whitney Holloway, presenters
Brenda Marques, sponsor

Oral Magnesium Supplementation for the Treatment of Cardiovascular Disease: An Evidence Analysis

Katelyn Mayberry, presenter
Brenda Marques, sponsor

Cognitive Effects of Multivitamins in Adults

Camille Pearce, presenter
Brenda Marques, sponsor

A Review of Selenium Supplementation for Hypothyroidism

April Wilson, presenter
Brenda Marques, sponsor

Alternative Hypertension Treatment for Individuals Unwilling to Make Lifestyle Modifications

Destin Hubbard, presenter
Brenda Marques, sponsor

Comparison of Four Common Ankle Taping Procedures: Standard vs. Continuous

Lauren Harris, presenter
Melissa Snyder, sponsor

Vitamin C Supplementation for the Treatment of the Common Cold: An Evidence Analysis

Chelsea Licht, Marisha Beaver, presenters
Brenda Marques, sponsor

School of Nursing

*AHOPE: Educating and Advocating for the Homeless Population **

Courtney Ball, Adam Lunsford, Sarah McQueen, presenters
Elizabeth Sexton, Cheryl Clark, sponsors

*Veterans Restoration Quarters: Training Veterans as Soldiers for Personal Health Promotion **

Janice Hill, Branson Taylor McMullen, Kaci Stepp, presenters
Elizabeth Sexton, Cheryl Clark, sponsors

Medical Jargon and End of Life Decisions: What is the Impact on Patient Education and Decision Making?

Kaitlin Gillespie, presenter
Carol MacKusick, Amy Putnam, sponsors

*Community Health Education and Prevention Strategies for Senior Citizens in Rural Western North Carolina **

Mitchell Joseph, Marcia Laslo, Alexis Ross, Kaitlyn McAllister, presenters
Cheryl Clark, Elizabeth Sexton, sponsors

*Syringe Exchange of Franklin: A Journey into Harm Reduction **

Taylor Thomas, Leigh Miller, presenters
Cheryl Clark, Elizabeth Sexton, sponsors

*Teaching Health Education and Management to the Homeless in Haywood County **

Alice Thompson, Alexandra Pate, Rickey Haggitt, Marykate Hodor, presenters
Cheryl Clark, Elizabeth Sexton, sponsors

*Food for Thought, A Service Learning Project at Open Door **

Rachael Johnson, Arianna Gonzalez, presenters
Cheryl Clark, sponsor

*What to do, Where to go: Harm Reduction and How Infections Show **

Carrie Doster, William Nabors, Tess Schneider, presenters
Elizabeth Sexton, sponsor

*Hope for the Homeless **

Megan Burnette, Kelsey Vaughn, Savannah Henderson, presenters
Elizabeth Sexton, sponsor

National Conference on Undergraduate Research 2017

Below are the projects accepted, titles, student presenters, and their sponsors listed by discipline and project titles for NCUR31, hosted this year by the University of Memphis.

More than 50 abstracts from WCU students were accepted to NCUR for the April 6-8, 2017 conference in Memphis, TN.

Art and Design

Cherokee Pronoun Project

Hannah Faub, presenter

Mary Anna LaFratta, sponsor

Biology

Keratin Attenuates Melanoma Cancer Cell Proliferation

Shannon Veilleux, Breanna Davids, presenters

Heather B. Coan, sponsor

Localization of Tps1 and Tps2 Proteins in the Pathogenic Yeast, Cryptococcus Neoformans

Erin Cafferty, presenter

Indrani Bose, sponsor

Keratin Dose-Dependently Rescues Hypoxia-Mediated Oxidative Stress and Apoptosis in Human Cardiac Stem Cells

Breanna Davids, Shannon Veilleux, presenters

Heather B. Coan, sponsor

Corbicula Fluminae: Tracking the Invasive Species up the Tuckasegee River

William Turonis, presenter

Thomas Martin, sponsor

Biochemistry

Biochemical Characterization of DNA

Polymerase in Cryptococcus Neoformans

ReLiza McGinnis, Lindsey Farris, presenters

Jamie R. Wallen, Indrani Bose, sponsors

Biology and Chemistry

Synthesis, Characterization, and Antimicrobial Studies of Chemically Modified Textile Materials using Zinc Oxide Nanoparticles for Potential Prevention of Healthcare-Associated Infections

Monica D. Reece, Nicole A. Dragan, Hannah N. Kline, Stephen Printz, presenters

Carmen Huffman, Indrani Bose, Channa R. De Silva, sponsors

Cellular Biology

Silencing PIF1 and PIF2 in the Pathogenic Yeast, Cryptococcus Neoformans

Samuel R. Walter, presenter

Indrani Bose, sponsor

Chemistry

Luminescent Studies of CA(II)-Doped EUNAYF₄ Nanoparticles

Yousif Muten, Laney Browder, presenters
Channa De Silva, sponsor

Chemistry and Physics

Characterization of Amino Acids Critical to Alpha-Glycerophosphate Oxidase Catalysis

Alma I. Plaza-Rodriguez, Aric Butler, C.M. Crowley, presenters
Jamie R. Wallen, sponsor

Symmetric Complexation of Boronic Acids with Ditopic Lewis Bases

Emily F. Pounds William R. Archer, presenters
William R. Kwochka, Robert D. Pike, sponsors

Complexation of Borinic Acid Derivatives with Lewis Bases

Nancy J. Wiebelhaus, presenter
William R. Kwochka, sponsor

Dative Bonds: A Method of Manufacturing Molecular Machines

William R. Archer, Emily F. Pounds presenters
William R. Kwochka, Robert D. Pike, sponsors

Luminescent Studies of Europium Metal Ion-Doped NaYF₄ Nanoparticles

Paige Phillips, Laney Browder, presenters
Dr. Channa De Silva, sponsor

Communications

Communicating Social Support

Kayla Harasymchuk, presenter
Candy J. Noltensmeyer, David Scales, sponsors

Criminal Justice

A Case Study of New Hanover Regional Medical Center's Evacuation Plan's Adherence to Best Practices

Peter Miller, presenter
Thomas Johnson, sponsor

City of Raleigh Waste Management Disaster Debris Removal Assessment

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Electrical Engineering

Fresnel Lens Concentration for First Generation Photo Voltaic Cells

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Impact of Coupled Fiber End Cleanliness on Bit Error Rate of Standard Multimode Optical Cable

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Engineering

A Comparison of Frontal and Sagittal Plane Axisymmetric Finite Element Models of the Left Ventricle

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Power Output of Flexible Solar Panel

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Correlation of Myoelectric Signals with Hand Gestures

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Overhead Assistive Robot

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Slider Crank Power Take-off System Buoy Optimization

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Social Scarf

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American Sign Language (ASL) Static Gesture Recognition Using Leap Motion Technology

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Limits of Heintzmann and Cremer's Super Resolution Technique

William C McCray, presenter
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English

Strange Fruit and Stranger Times

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Lies Which Make the Story: Analyzing the Narrative of Olaudah Equiano

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Lucifer of the Orient: Evocation of the East in Paradise Lost

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Harry Potter and the Curse of Queerbaiting

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Raphael: The Arch-angel Who Said Too Much or The Right Being for The Job in Milton's Paradise Lost?

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Atheist Discrimination in America Real or Imagined?

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Do You Hear What I Hear: The Rhetorical Styles of God and Satan in Milton's Paradise Lost

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The Sun Shines To-day Also: A Modern Reflection of Transcendental Tradition in the Works of Wendell Berry

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Ishmael and Queequeg's Relationship: Melville's Early Attempts at Inclusion

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The Foci of Race and Religion Amongst Authors William Apess, Mary Rowlandson, and Zitkala Ša

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Poe's Place in American Cannon: Analysis of the Narrative of Arthur Gordon Pym of Nantucket and Melville's Moby Dick

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Far from "Mere": Similarities in Poe's "The Black Cat" and Gilman's "The Yellow Wall-Paper"

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God's Array of Emotions in Paradise Lost

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Ishmael's White World

Lisa Schiller, presenter
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English Literature

*"Cycle and Epicycle, Orb in Orb": Milton's
Archaic Cosmos in Paradise Lost*
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Mimi Fenton, sponsor

History

*Baseball and the Culture of Conformity at the
Dawn of the Cold War*
Darren Beebe, presenter
Robert Ferguson, sponsor

*Breaking New Ground: A Deeper Look into
Two of North Carolina's Earliest Public
Universities*
Kiara Hines, presenter
Robert Hunt Ferguson, sponsor

Mathematics and Computer Science

*Can Cellular Automata Improve Data
Security?*
Bailey Stillman, presenter
Andrew Penland, sponsor

Mechanical Engineering

MR Fluid and the Effects of Temperature
James Bishop, presenter
Sudhir Kaul, sponsor
Bicycle Brake using Magnetorheological (MR)
Richard Lavalley, presenter
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Music

*The History of Germanic Notation and
Shostakovich's Tenth Symphony*
Brandon Kassab, presenter
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Music Performance

*Decoding the Analytical Envelope of Alan
Theisen's "Sonata No. 2"*
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Nursing

*Medical Jargon and End of Life Decisions:
What is the impact on patient education and
decision making?*
Kaitlin Amber Gillespie, presenter
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Philosophy & Religion

*Aristotle's Poetics and The Rocky Horror
Picture Show*
Alison Russell, presenter
John Whitmire, sponsor

Political Science

*Gender Quotas and Substantive
Representation: Lessons from Cape Verde*
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Psychology

Machiavellianism and Self-Esteem Instability
Ray Houston, Stephanie Mason,
presenters
Christopher J. Holden, sponsor

Undergraduate Academic Project Grants 2016-17

Initiated by Chancellor John Bardo in 1996, the Undergraduate Academic Projects Grant Program funds a variety of student projects. Sixty-eight students were awarded with grants by the committee as of March 10, 2017. Many thanks to the Academic Project Grant committee for their work. Members of the committee include:

Kia Asberg	College of Education and Allied Professions
Paromita Biswas	Hunter Library
Indrani Bose	College of Arts and Sciences
Jim Coffin	College of Engineering and Technology
Kim Hall	College of Health and Human Sciences
Sanjay Rajagopal	College of Business
Christina Reitz	College of Fine and Performing Arts
April Tallant, Chair	The Honors College

College of Arts and Sciences

Biology

*The Effects of Urbanization on Extra-pair Paternity in Eastern Bluebirds (*Sialia sialis*)*
Brandon Gerringer, recipient
Barbara Ballentine, sponsor

*Phylogeography of the Mole Salamander, *Ambystoma talpoideum* (Caudata: Ambystomatidae)*
Michael Frazier, recipient
Joe Pechmann and Kathy Mathews, sponsors

Chemistry and Physics

American Chemical Society Travel Grant
Ryan Archer, Rachel Downing, Aaron Lipchak, Kenneth Nilsson, Emily Pounds, Monica Reece, Jordan Spell, Nancy Wiebelhaus, recipients
David Evanoff, Bill Kwochka, Channa De Silva, Brittany Lott, sponsors

Communication

Exploring Communication Apprehension Among College Students
Colin Croat, recipient
Candy Noltensmeyer, sponsor

Geosciences and Natural Resources

Historic Land Use Disturbances Recorded in Soil Profiles Along a Slope in The Southern Appalachians, Western North Carolina

Bryce Vascik, Stephanie Earle, Quentin Walton, recipients
Mark Lord, sponsor

Mapping Active Stream Lengths as a Tool For Understanding Spatial Variations in Runoff Generation

Elizabeth Erwin, recipient
JP Gannon, sponsor

Serpentinization and its Effects on Olivine Composition in Dunite

Sierra Ramsey, Richard Pedigo, Sean Price, Eldridge Machen, Aras Mann, Don Marlor, Felipe Silva, Stephanie Earle, Mackenzie Ray, recipients
Amy Fagan, sponsor

Examining Regional Pyroxene Compositions in Terrestrial Dunite Samples to Better Understand Compositions Collected from Apollo Lunar Dunite Samples

Justin Winter, Liam Turner, Daniel Edwards, Courtney Hartman, Mitch Streicher, Roderick Dupree, Jon Hillsgrove, Josh Tatum, recipients
Amy Fagan, sponsor

Relict Grains in CM Chondrites: Possible Indicators of Chondrule Alteration in the Pre-Accretionary Solar System

Michael Cato, recipient
Amy Fagan, sponsor

An Overview of Type II Chondrules in The CM Chondrite Jiblet Winselwan

Michael Cato, recipient
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Combining Geological Mapping and Lidar Data to Characterize Fracture Patterns in Poorly Exposed Crystalline Bedrock in the Southern Appalachians, Western NC

Kathryn Allen, recipient
Cheryl Waters-Tormey, sponsor

Paleoecological Explorations of Marine Invertebrate Fossils from the Ordovician of Kentucky and the Pleistocene of Florida

Rainee Howard, Holly Hurding-Jones, Richardson Pedigo, recipients
Frank Forcino, sponsor

Variations in Active Stream Length with Discharge in Two Headwater Streams: Implications for Spatial and Temporal Variability in Runoff Generation

Elizabeth Erwin, recipient
JP Gannon, sponsor

Electron Microprobe Analysis on Lunar Meteorite Sample Northwest Africa 8632

Sierra Ramsey, recipient
Amy Fagan, sponsor

Using Surface and Ground Water Chemistry to Investigate Spatial Variations in Streamwater Chemistry and Their Possible Connection to Previous Land Use in a Headwater Stream

Joshua Tatum, recipient
JP Gannon, sponsor

Characteristics of Groundwater-stream Water Interaction in a Disturbed Headwater Catchment Within the Southern Appalachian Mountains

Don Marlor, Eliza Hurst, Aras Mann, Andrew Ross, Bryce Vascik, recipients
Mark Lord, sponsor

History

The Walton War: A Forgotten History
William McDaris, recipient
Robert Hunt Ferguson, sponsor

College of Education and Allied Professions

Psychology

*Community College: The Effects on Academic
Success for Transfer Students*
Manuel Zenquis, recipient
Ellen Sigler, sponsor

College of Engineering and Technology

School of Engineering and Technology

*A Study on Control Strategies in Swarm
Robotics*
Matthew Hill, recipient
Yanjun Yan, sponsor

College of Fine and Performing Arts

School of Art and Design

Tote Bag
Tuyen Tram, Vincent Cuffee, recipients
Betty Torrell, sponsor

Cherokee Pronoun Project
Hannah Faub, recipient
Mary Anna LaFratta, sponsor

Women at Work: 1980's and Today
Caroline Rains, recipient
Jon Jicha, sponsor

College of Health and Human Sciences

School of Health Sciences

Determining the Validity of the Modern Morphological Classification of Two "Bowed-nose" Mosquito Subspecies Using a Molecular Approach

Corey Day, recipient
Brian Byrd, sponsor

Prehospital Care Research Forum Travel Grant

Natalie Penny, Devin Warner, Nick Tuttle, Jill DeBoer, Erica Montano, Christina Snyder, Kevin Tutterow, Tyler Peterson, Shenandoah Ragsdale, Jeremy Knox, Kellie Sutter, Amanda Smith, Max Domalavage, Kelsey Keller, recipients
Michael Hubble, sponsor

2016-2017 STAR Engagement Projects

Center for Service Learning

STAR Engagement Projects are submitted through the Community-based Activities Survey of 150-word abstracts and reviewed to determine the top project in a curricular area. The program has a focus on exemplary projects involved in a mutually beneficial and collaborative community partnership that have a clear involvement of students. STAR Engagement Projects receive \$500 grants for activities, conferences and related opportunities during the academic year. Service engagement projects allow campus participation in community betterment activities with the goal of student learning related to an academic discipline, and meeting an identified need within the region or other geographical area. See STAR Engagement Project posters on display at the Research & Scholarship Celebration, Undergraduate Expo on March 29, 2017.

WCU & the Health Care Enrollment Program: Informing, Educating, and Enrolling North Carolinians into Affordable Health Insurance Programs

Faculty Facilitator: Amy Murphy-Nugen
Community Partners: Enroll America, Pisgah Legal Services, Mountain Projects

WCU & Food Insecurity: Developing and Implementing through Education

Faculty Facilitator: Brian Railsback
Community Partner: United Christian Ministries

WCU & Homeward Bound: Health Fairs for the Homeless Population of Asheville

Faculty Facilitator: Elizabeth Sexton
Community Partners: Homeward Bound, WNCAP, Dale Fell Clinic, and Buncombe County Department of Public Health

WCU & Activity Expo: Creating Educational Activities for Adults with Developmental Disabilities

Faculty Facilitator: Ellen A. Sigler
Community Partner: Lifespan Services

WCU & iFixit: Combining Learning with Purpose to Reduce e-Waste

Faculty Facilitator: Andrew Virtue
Community Partner: iFixit

WCU & the Good Samaritan Clinic: Aligning Public Relations Campaigns and Public Health

Faculty Facilitator: Scott Eldredge
Community Partner: Good Samaritan Clinic

WCU & the HIGHTS Program: Learning Adventure-Based Approaches with Real-World Results

Faculty Facilitator: Jennifer Hinton
Community Partner: HIGHTS program

*WCU & USFS Collaboration Provides
Students Opportunity to Study Climate
Change*

Faculty Facilitators: Diane Styers, Ben
Tanner

Community Partner: Ocala National
Forest, Ocala, Florida

*WCU & the Cherokee Central High School:
Pronouns Comprehension, Cross-Cultural
Collaboration, and Student Engagement*

Faculty Facilitators: Mary Anna LaFratta
Hartwell Francis, Tom Belt

Community Partner: Cherokee Central
High School

*WCU & the Sylva Community Table:
Teaching Students to Put Their Mud Where
Their Mouth Is*

Faculty Facilitator: Heather Mae Erickson

Community Partner: Community Table

From the 2017 Undergraduate Expo Sponsors

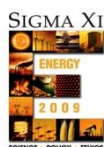


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Sigma Xi, the Scientific Research Society, actively promotes the promise of science and technology. Sigma Xi's goals are to foster worldwide interactions among science, technology and society; to encourage the appreciation and support of original work in science and technology; and to honor scientific research accomplishments.

Since its founding in 1886, Sigma Xi members and chapters have enriched scientific discussion and nurtured networking between young and established scientists and engineers from diverse research disciplines. With approximately 60,000 members in over 500 chapters around the world, Sigma Xi chapters are found wherever scientific research is undertaken. Sigma Xi's motto, *Spoudon xynones*, or "Companions in Zealous Research," makes the Undergraduate EXPO a particularly natural opportunity for Sigma Xi to partner in facilitating.



Acknowledgements

Western Carolina University, the Office of the Provost, Graduate School and Research, and The Honors College would like to thank all student participants, both undergraduate and graduate, who shared their work at the 2017 Research and Scholarship Celebration (RASC). Thanks are also in order to the faculty and staff who sponsored and supported the student participants and those who encouraged participation in the Undergraduate Expo and Graduate Research Symposium.

It is with gratitude that we thank our talented and knowledgeable faculty research panel. Your influence on research at WCU is notable and appreciated.

We are also grateful to the Center for Service Learning for sharing the STAR Engagement Projects at RASC this year. What an excellent addition!

We are particularly thankful that Marie T. Cochran, our keynote speaker, could join us this year.

Thank you to the Ramsey Arena staff, Aramark catering and staff and the print shop for all of your support and help in making this event a success.

Thanks to our faithful volunteers: the Honors College student Board of Directors members, Honors College Ambassadors, and faculty and staff who volunteered their time to help with all things Expo.

NCDOCKS

WCU is a member of NC Digital Online Collection of Knowledge and Scholarship (NCDOCKS). Contact Assistant Professor Liz Skene (emskene@email.wcu.edu) of Hunter Library to learn how you can post your project in this online repository for easy sharing with potential employers, graduate schools, etc. More information is available at <http://libres.uncg.edu/ir/wcu/submitting.aspx>.

Student Press Releases

WCU's Office of Communications and Public Relations routinely sends news releases about student activities and honors to the hometown or local newspapers of the students involved. Students participating in the Undergraduate Expo who wish to take advantage of that service should visit the website <http://studentawards.wcu.edu> to complete an online form and submit it via email to the Office of Communications and Public Relations.

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