

2022 ACU
UNDERGRADUATE RESEARCH,
CREATIVITY & INNOVATION FESTIVAL



APRIL 12, 2022
OFFICIAL PROGRAM

The Undergraduate Research, Creativity and Innovation Festival
is brought to you by

ACU Undergraduate Research, Creativity and Innovation

blogs.acu.edu/undergradresearch

blogs.acu.edu/researchfest

uresearch@acu.edu

A Message from the Director:

Welcome to ACU's 14th annual Undergraduate Research, Creativity and Innovation Festival. This conference celebrates some of the best of our students' work – work that requires intellectual curiosity, creativity and critical thinking. Together we also honor the partnership between the student researchers and the faculty who mentor them. Many hours of hard work have gone into the preparation for this event, so many thanks to the URCI Festival Planning Committee. And finally, whether you are presenting your art or research, judging the entries, or simply learning about others' creative scholarship, we are so appreciative of your support for our Undergraduate Scholars. Enjoy the Festival!

Dr. Joshua Brokaw

Faculty Director of Undergraduate Research, Creativity and Innovation

Faculty Sponsor of the ACU Undergraduate Scholars



**UNDERGRADUATE
SCHOLARS**

Festival Schedule Overview

8:00 – 3:00 PM Registration

Lobby of the Hunter Welcome Center

9:30 – 10:50 AM Oral Presentations

AH1: Reflections on Literature – McCaleb Room Zone A

AHS1: Physical and Social Science – AT&T Theater

SS1: Application of Communication Theories and Exploring Sociological Experiences –
Alumni Conference Room

STEM1: Medical Isotopes in Nuclear Reactor Research – McCaleb Room Zone B

11:00 – 11:30 AM Chapel – LYNAY Classroom

11:30 – 1:00 PM Lunch is served

McCaleb Room Zone C

11:30 – 12:10 PM Poster Session I & Images of Aging

Hunter Welcome Center Atrium

12:15 – 1:00 PM Poster Session II & Images of Aging

Hunter Welcome Center Atrium

1:30 – 2:50 PM Oral Presentations

AH3: Image and Inequality – Alumni Conference Room

AHS2: Social Science and Humanities – AT&T Theater

STEM2: Experimental Research of Biological Phenomena – McCaleb Room Zone A

STEM3: Mathematical and Computational Science – McCaleb Room Zone B

3:00 – 4:20 PM Oral Presentations

AH4: Mental Health and Self Expression – Alumni Conference Room

STEM4: Nuclear Reactor Research – McCaleb Room Zone B

STEM5: Research in the Physical and Chemical Sciences – McCaleb Room Zone A

4:30 – 6:00 PM Top Scholars Presentations

AH5: Top Scholars in the Arts and Humanities – McCaleb Room Zone B

SS2: Top Scholars in the Social Sciences – Alumni Conference Room

STEM6: Top Scholars in STEM – McCaleb Room Zone A

6:00 – 7:00 PM Awards Ceremony

McCaleb Room Zone C

Sessions

9:30 to 10:50

Arts & Humanities 1 – McCaleb Room Zone A

- AH11 – *Young Adult Literature: Creating Empathy and Understanding Through Reading*
Kelsea Abston
- AH12 – *Memory & Identity: The Power of Memory in Rowling's "Harry Potter" Series*
Caroline Kennemer
- AH13 – *Brontë and Modern Day: Romanticizing Toxic Relationships in Wuthering Heights*
Skyler Gill
- AH14 – *Jane Austen, the Esteemed Idol or Overpraised Mediocrity?: An Examination of the Modern Feminist Perception of the Ever-Prominent Austen*
Madeline Thompson
- AH15 – *The Rhetoric of Fleabag: An Analysis of Mental Health Portrayal in Television*
Emma Barnhouse

Abilene High 1 – AT&T Theater

- AHS1 – *Is Renewable Doable?*
Rowan Young
- AHS2 – *It's About Time: The Study of How New Developments in Calculating Time and History Affects Our Perception Of Both.*
Hailey McFadden
- AHS3 – *Nietzsche on Steroids: The Link Between Nihilistic Tendencies in Modern Medical Issues and Dwindling Spiritualism*
Brooke Garduno
- AHS4 – *Rethinking PTSD; Exploring New Research*
Veronica Willis
- AHS5 – *iPad Kids? The Sociological Effects of Smart Device Introduction at a Young Age.*
Jacob Pate
- AHS6 – *¿Habras Inglés? Examining if Learning a Secondary Language is Plausible and Practical in America.*
Brock Scoggin

Social Science 1 – Alumni Conference Room

- SS7 – *An Examination of the 2017 Equifax Data Breach: Crisis Response Through the Lens of Situational Crisis Communication Theory*
Mitchell Melrose
- SS8 – *The British National Party in Context*
Chloe Deffner
- SS9 – *Times Are A Changin': Views on Traditionalism versus Egalitarianism in Christian College Culture*
Amelia Little, Alex Nguyen, Caleb Crecelius, Courtney Massey, Kaelyn Berlanga
- SS10 – *A Phenomenological Study to Describe the Experience of Being Slain in the Spirit*
Jared Yanez
- SS11 – *Investigations into Understanding the Student Experience at the Intersection of Faith and Evolutionary Theory*
Sophia Wagle

STEM 1 – McCaleb Room Zone B

- ST35 – *Extraction of Molybdenum Using Bis(2-ethylhexyl) Phosphate and Di(octyl-phenyl) Phosphoric Acid*
Justin Tobar
- ST36 – *Methods for Identification and Quantification of Elements in Molten Salts*
Benjamin Ash, Evan Babb
- ST37 – *Carbon nanotubes as a possible method for harvesting medical isotopes for NEXT*
Jared Mayfield
- ST38 – *Quantifying Trace Elements via ICP-MS and Identifying Detection Limits*
Emma Bonamie

11:30 to 12:10: Poster Session 1

Hunter Welcome Center Atrium

Arts and Humanities

- AH01 – *An evaluation of current list of Texas UIL Class I Bass Clarinet Solos*
Triston Swisher
- AH03 – *National Security Issues Caused by Negligent Reporting and Reduction of Sex Trafficking*
Royce Clough
- AH05 – *Catherine of Aragon in Public History*
Catherine Shewmaker
- AH07 – *From the Field to the Studio: Landscape Painting in Texas*
Rebekah Conder
- AH09 – *Heritage Chocolate Brand Identity and Packaging Concept*
Sonia Seguin

Social Sciences

- SS01 – *The Emotional Impact of Multi-Factor Authentication for University Students*
Anthony Moncivais, Garrett Powell, Ben Blackmon, Nathaniel Wade
- SS03 – *Alumni Attitudes about the Online College Social Life Survey at ACU*
Grayson Chapman
- SS05 – *Attitudes about LGBTQ+ Among Heterosexual Population in a University Setting*
Kendel Krutsch, Tori Tschoepe, Salma Valadez

Science, Technology, Engineering, and Mathematics

- ST01 – *An Investigation of Antibody Titers in Hospitalized COVID-19 Patients*
Susan Taylor, Frank Fang, Jiyeon Kim, Hongjian Chang
- ST03 – *Separation of Molybdenum from Molybdenum-Alpha Benzoin Oxime Complexes*
Hongjian Chang
- ST05 – *Investigating Various Trace Heat Options for Small Diameter Components on the FMSTL Loop*
Ziyu Gao
- ST07 – *Molten Salt Test System (MSTS) Drain Tank*
Carson Noack, Kaden Vasquez
- ST09 – *A backdoor strategy to elucidate the thermodynamics and structural determinants of drug induced Long QT syndrome by blockade of the hERG channel*
Jorie Fleischman
- ST11 – *Genetic Variation in *Caenolestes sangay* and Related South American Marsupials*
Aspen Malone, Megan Howard, Katie Howe
- ST13 – *Describing the Edaphic Niche of *Mentzelia thompsonii**
Gracie Granados, Katie Howe, Jessica Edo
- ST15 – *Achilles Tendon Rupture in a Football Player*
Courtney Bynum
- ST17 – *The CAR Process: From Mountain to Molehill*
Ethan Conatser
- ST19 – *Bird-window Collisions Trends on a Central Texas University Campus*
Katelyn Zak, Blakely Eller, Gracie Granados
- ST21 – *Design of a Backwash Filter System for Molten Salt*
Reuben Howe
- ST23 – *Modulation of Bacterial Host Phenotypes by Mycobacteriophage Pixie Gene Products*
Selina Alvarado, Aeron Pennington

- ST25 – *Double-Tethered DNA Curtains in Supported Lipid Bilayers*
Conner Crawford, Kirsten Gafner
- ST27 – *Environmental Sampling and Survey of SERC Site*
John Dalton, Neddy Chepkoech
- ST29 – *Bulging Disc in Female Tennis Player*
Brianna Brauner
- ST31 – *Mutagenesis of Amino Acid Residues in and Around the Active Site of HMG-CoA Synthase of *Enterococcus faecalis**
Kaylee Dahl, Alex Cortinas, Madison Martin
- ST33 – *Heater Control Tuning for Molten Salt Applications*
Ronald Hotchkiss, O'Brien Verdin

12:15 to 1:00: Poster Session 2
Hunter Welcome Center Atrium

Arts and Humanities

- AH02 – *Dramaturgical Research of the musical Light in the Piazza*
Chloe Munson
- AH04 – *La Malinche: A Mother, A Victim, A Whore*
Abigail Waldrop
- AH06 – *The Human Connection*
Allee Casey
- AH08 – *Bonzai Japanese Restaurant: Brand and Identity Concept*
Ashley Lang
- AH10 – *Design to Make a Difference: Concept*
Courtney White

Social Sciences

- SS02 – *The Effect of Moderate-Intensity Exercise on God Locus of Health Control: A Pilot Study*
Cooper Mitchell, Katrina Sie
- SS04 – *A Survey of Prosecutorial Philosophies and Their Effects on Sentencing.*
Bryan Briones
- SS06 – *Predictors of Exercise Motivation and Intrinsic Motivation in College Students*
James Harry

Science, Technology, Engineering, and Mathematics

- ST02 – *An Exploratory Longitudinal Study on the Immune Response to COVID-19 Vaccines*
Hongjian Chang, Benjamin Ash, Maddie Conatser, Susan Taylor
- ST04 – *The Adaption of a Vessel to Pneumatically Transfer Molten Salt from One Vessel to Another*
Ashton Guerry, Lydia Sanchez
- ST06 – *Optimization and Development of a Thiocyanate Calibration Curve as a Molybdenum Indicator*
Kylie Davis
- ST08 – *Reconstructing Historical Geography of *Mentzelia thompsonii* Using Population Genetics*
Katie Howe, Gracie Granados, Jessica Edo
- ST10 – *Identification of Bacteria from Sorcerer's Cave that Inhibit Quorum Sensing*
Claire Ely

- ST12 – *Genetic Diversity and Breeding Patterns of ACU's Feral Cat Population Based on Population Genetics*
Bryan Herrera, Misha Muñoz, Megan Howard
- ST14 – *Hemorrhagic Bursitis Pes Anserine in Female Softball Player*
MeKaela Bell
- ST16 – *Design, Construction, and Testing of a Portable Electrical Heater Controller*
Theodore Mirimo Nganizi
- ST18 – *SARS-CoV-2 Spike Protein Sequence Variation Among Nonsymptomatic Test Subjects.*
Daniella Johnson, Sierra Brock, Abigail Cortinas
- ST20 – *Comparison of Quorum Sensing Inhibition Between Isolates of Pseudomonas chlororaphis*
Brianna Garrett, Sage Lauderback
- ST22 – *Characterization of Potential Developmental Roles for Zebrafish Biliverdin Reductase Isoforms Using CRISPR-Cas Technology*
Macee Valtr, Ashley Price
- ST26 – *Analysis of SARS-CoV-2 Variants from Asymptomatic ACU Individuals During 2020-2021*
Mariana Castillo, Noah Bales, Gracie Granados, Elizabeth Crawford
- ST28 – *Initial Bromination and Allylic Oxidation Steps in the Synthesis of Phorbosone A*
Thor Peterson, Emily Osborn
- ST30 – *Testing the Functionality of a Contactless Seal in a Molten Salt System*
Caleb Daniel
- ST32 – *Synthesis of Novel Diosmium-Halide Compounds*
Elizabeth Bryant, Erik Oas
- ST34 – *Multichannel Trace Heater Controllers for Molten Salt Systems*
Colby Smith

11:30 to 1:00: Images of Aging
Hunter Welcome Center Atrium

Photography

- Praying with Grandma*
Anna Voth
- So God Made a Farmer*
Sophie Fox

1:30 to 2:50

Arts & Humanities 3 – Alumni Conference Room

- AH16 – *An Analysis of Boeing's 737 MAX Air Crisis through the Lens of Image Restoration Theory*
Eastin Kandt
- AH17 – *How one music video challenged gender inequality: Analysis of "The Man"*
Mae Williams
- AH18 – *Por La Ruta de Lenin: The Early Relationship Between Cuba and the Soviet Union*
Aidan Beck
- AH19 – *Hooverville: A Forgotten History of Neglect*
Kaleigh Martin

Abilene High 2 – AT&T Theater

- AHS7 – *The Wilde Side: Applying Archetypal Analysis to find the "Trickster" in Wildean Literature*
Micah George
- AHS8 – *Education Reform and Teacher Salary*
James Wellborn
- AHS9 – *I'm the Best Persuader: Hierarchies of Motivational Factors for Joining an Advance Class*
Peter Nguyen
- AHS10 – *The Kids Behind the Mask*
Chelsea Rainwater
- AHS11 – *Its Society's decision*
Viviana Hita-Murillo
- AHS12 – *Mythology Around Us*
Zane Barrett

STEM 2 – McCaleb Room Zone A

- ST39 – *Development of Microsatellite Loci for Population Genetic Analysis of *Mentzelia thompsonii**
Megan Howard, Yourim Cho, Piyush Pathak, Aspen Malone
- ST40 – *Past and Future Geographic Migrations of *Mentzelia thompsonii* Based on Climate Modeling*
Brianna Douglas, Gracie Granados, Katie Howe
- ST41 – *Inhibition of Bacteria Using Resin-Extracted Antibiotic Fractions From Cave Isolates*
Evan Babb, Joshua Holt
- ST42 – *Isolation and Annotation of Cluster EE Bacteriophage Loka*
Aurod Ounsinegad

STEM 3 – McCaleb Room Zone B

- ST43 – *Dynamics of Eastern Equine Encephalitis Infection Rates: A Mathematical Approach*
Aurod Ounsinegad
- ST44 – *Simulating a Predator-Prey System with a Lotka-Volterra Model Using Random Coefficients Estimated from a Dataset*
Thi Thu Huong Vo
- ST45 – *Simulation of Tc-99m generator*
Arella Kangsudarmanto
- ST46 – *Using Python to Teach Physics*
Ally Brant

3:00 to 4:20

Arts & Humanities 4 – Alumni Conference Room

- AH20 – *The first two years: An analysis of Volkswagen Emission Scandal*
Mae Williams
- AH21 – *The Classification of Avant Garde Works for Solo Tuba*
Carson Ross
- AH22 – *Rhetoric of Ted Lasso: Rhetors Creating Safe Spaces to Talk About Mental Health*
Eden Barnhouse
- AH23 – *Older Adult Well-Being During the Covid-19 Pandemic: An Exploration of Coping Responses Amid Social Isolation*
Emily Hand

STEM 4 – McCaleb Room Zone B

- ST47 – *Investigations into Separation of Molybdenum-99 from Other Fission Fragments Using Tetraoctylammonium Bromide Complexes*
Sophia Wagle
- ST48 – *Evaluation and Reduction of Temperature Maxima through Simulation of the MSRR for NEXT*
Nate Rowlands
- ST49 – *Piezoelectric Nebulizer*
Sydnee Ervin, Victory Egot
- ST50 – *Electrochemical System for Molten Salt Analysis*
Victory Egot, Tierra West
- ST51 – *Small-Scale Salt Purification System Gasket Safety Test and Rationale*
Michael Ranger, Adam Kish

STEM 5 – McCaleb Room Zone A

- ST52 – *Automatically finding exoplanets in Kepler data*
Ji Cen
- ST53 – *Investigation of reactions between osmium carbonyl and pyridine*
Rebecca Atkins
- ST24 – *Two new diruthenium-pyridine complexes*
Stephanie Tran
- ST54 – *Investigations of Diamine and Diisocyanate interactions by Conducting Polyurea Linkage Synthesis Reactions*
Emma Bonamie
- ST55 – *Synthesis and Polymerization of Capsaicin Derivatives*
Rachel Browning, Leo Garcia

4:30 to 6:00: Top Scholars

Arts & Humanities 5 – McCaleb Room Zone B

- AH24 – *A Dead Argument: The Stoic's Disbelief of Paul's Profession of the Resurrection in Acts 17:16-34*
Mason King
- AH25 – *"A Meltdown Between Friends": An Exploration of Fan Culture and Celebrity Mental Health*
Chloe Brownell
- AH26 – *Britain in Egypt: Britain's Impact on Egyptian History and Archeology from the Conquest to Early 20th Century*
Emma Longley
- AH27 – *Charles and Roy Root Beer: Brand Identity Concept*
Sonia Seguin, Ashley Lang
- AH28 – *Isabella's plea and Angelo's plight*
Madison Sipe

Social Science 2 – Alumni Conference Room

- SS12 – *From Democracy to Autocracy: Analyzing the Correlation of the Term of Office on Latin American and Caribbean Democracy*
Bryson Frank
- SS13 – *Blood in the Nile: "Hydropolitics" and Diversions from Dissent*
Emy Pablico
- SS14 – *Religious Coping and Issues of Race During Global Pandemic*
Katie Walker, Anthony Egbo
- SS15 – *Owning Your Mistakes: An Analysis of CrossFit's Strategic Crisis Communication Theory*
Emma Barnhouse
- SS16 – *The Correlation Between Math Anxiety and Growth Mindset Interventions Within Different Pedagogical Styles*
Brookley Baker, Traci Yandell

STEM 6 – McCaleb Room Zone A

- ST56 – *Meteor Tracking Using RF Signal Detection*
Emily Branson, Nate Rowlands
- ST57 – *Measuring Filter Media Characteristics Using the Molten Salt Filter Media Test System*
Bertha Sanchez
- ST58 – *Paw Preference and Behavior in Canis lupus familiaris and Felis silvestris catus*
Abigail Williams
- ST59 – *Antibiotic Resistance in Bacterial Isolates from Sorcerer's Cave*
Braden Smith, Sophia Wagle
- ST60 – *Di- and trinuclear osmium cluster complexes with bridging pyrazobyl ligands*
Sarah Dunn
-

A special thanks to...

...the co-sponsors of the Undergraduate Research, Creativity & Innovation Festival

The Honors College

The Pruett Gerontology Center

The Office of Research and Sponsored Programs

The Office of Undergraduate Research, Creativity & Innovation

...the Faculty Director of Undergraduate Research

Joshua Brokaw

...the Office of Research and Sponsored Programs

Megan Roth and Karla Perkins

...the University Undergraduate Research Council

Greg Brooks

Jeff Goolsby

Jennifer Hennigan

Larry Isenhower

Kathleen Lee

Dan Morrison

Candice Ortvals-Wiser

Curt Niccum

...the ACU Undergraduate Scholars Panel

Emily Branson

Emma Conatser

Brianna Douglas

Sarah Dunn

Leonardo Garcia

Brianna Garrett

Drake Hernandez

Erin Hodgson

Elizabeth Jennings

Heather Johnson

Emily King

Emily McDonald

Cecily Powell

Jessica Rice

Sierra Shoaff

Sophia Wagle

...the Undergraduate Research Festival Planning Committee

Marisa Beard

Mikee Delony

Jim Drachenberg

Cherisse Flanagan

Amos Gutierrez

Jennifer Hennigan

Darby Hewitt

Andrew Holowiecki

Andrew Huddleston

Jennifer Huddleston

Larry Isenhower

Kendra Jernigan

Kathleen Lee

Lauren Lemley

Suzie Macaluso

Mark McCallon

Dan Morrison

Candice Ortvals-Wiser

Aaron Robison

Trey Shirley

...our many presentation judges from offices and disciplines across the university

Sponsors

2022 ACU Undergraduate Research, Creativity and Innovation Festival



PRUETT

GERONTOLOGY CENTER