



An Exposition of Student and Faculty Research,  
Scholarship, and Creativity

MAY 7, 2022 | NOON-3 P.M. | TARC Field House

Faculty Research, Scholarship, and Creativity Committee

Kim Instenes  
John Kirk

Nora Nickels  
Tony Pustina

James Ripley  
Jun Wang



Scan for full abstracts and project details.







## CELEBRATION OF SCHOLARS



Dear Carthage Community,

The arrival of this day brings me great pleasure and pride. Our celebration of student and faculty research, scholarship, and creative work puts the spotlight on our most fundamental values and efforts as a college. While I do not know the specific experience of each of the students in conducting this work represented in the Celebration of Scholars this year, my own experiences over the years make clear that it is highly likely that they struggled, they invested more time than they imagined they would, and that the project took on new forms and greater depth than they first imagined it would. And, that it was these steps taken that one did not at first imagine taking when much of the learning and growth took place. Let us celebrate it all!

One of the fundamental features of this student and faculty work is what it is not. It is not done instantaneously, for example, with a tap on a touch screen! It is slow, thoughtful, and in most cases marked much more by failure than success. Most often, for example, it is only by writing a poor paragraph or page that one can get to a good paragraph or page. The work of scientific work most commonly progresses by a failed experiment that leads to a new set up or adjustment that leads to a success or, the failure itself provides the needed information for a completely new approach to the object of study. The creative expressions of the musician, the theatrical performer, and the artist all progress through practice, rehearsal, and return after return to the same canvas or material object under construction. In our day of having so much at our fingertips and so much that is instantaneous, these slow cook efforts are notable and incredibly important learning experiences for our students. Dare I say that most of what is truly good and productive in this world is produced in this slow cook method? Well, I just said it. Perhaps you agree and perhaps not.

Second, I love this event because it gives students the opportunity to stand and deliver. That is, they are present as we the curious make our way from project to project. And, it is natural and enjoyable to ask questions and listen to students explain what they have done, how they did it, and the significance of the work and the meaning they have made from it. This too is a life skill in formation. The faculty sponsor is likely not present or if they are, they are at a distance, allowing the student to shine. This is a flip the script moment for students as so much of the time it is the faculty member who is in this role. But not today, no it is the student who will bring clarity and meaning to the presentation if it is to happen. Wonderful!

I hope you enjoy the day as much as I know I will. Please join me in congratulating the students and faculty who are presenting this wonderfully rich range of scholarship, research, and creative work. These are some Carthaginians!



David Timmermann  
Provost and Chief Academic Officer, Professor of Rhetoric

## Celebration of Scholars

**65** Impact of deposition conditions on the quality of silica nanoparticle crystalline structures

**Alcala, Marissa; Figgins, Bailey; Thomas, Rachael**

**34** The Effects of General Infrastructure Investments on a FIFA World Cup Host,Ãs Exports

**Arbeiter, Sydney**

**1** Design of the 2023 Celebration of Scholars Logo

**Beck, Owen**

**70** Traumatic Stress Within First Responders

**Bednarz, Samantha**

**63** Radical Halogenation Using Photocatalysis

**Benz-Weeden, Anna**

**30** Marketing for a Dying Faith: The Innovative and Influential Marketing Strategies of Christianity

**Bergman, Kyle**

**71** A Sensory and Functional Communication Intervention for Students with Sensory Processing Disorder

**Borree, Halle**

**50** Immunofluorescence Staining of Zebrafish Retinal Ganglion Cells

**Boucher, Asher; Fales, Rebecca; Trujillo, Guillermo; Young, Sarah; Vitek, Natalie**

**42** For Division III College Football Athletes, Does Having A Max Squat That is Over 200% Their Body Weight Increase the Likelihood of Knee Pain Occurring During a Competitive Season?

**Boucher, Jacob**

**13** As Long As The Grass Shall Grow: Teaching Native American Heritage

**Broeffle, Nadine**

**67** Death, Dying, and Politics: An Examination of the Politicization of Death Using COVID-19 Vaccinations

**Brugger, Kaila**

**35** Don't Bet the Under: The Legalization and Regulation of Sports Gambling

**Budzisz, David**

**36** Applying Network Theory in Analyzing Differential Recruiting Outcomes

**Budzisz, David**

**56** Antimicrobial Properties of O-acylated Amino Acid Surfactants

**Chapa, Vanessa; Iqbal, Liza**

**16** The Discourse-Pragmatic Functions of Sentence-Final Particles Wa and No in Japanese Male Conversation

**Childress, Jessica**

**53** A High Resolution Growth Series of Dimetrodon

**Cochran, Nathaniel**

**55** Tool Development for Studying Potato Virus Y Infection

**Curran, Cecilia**

**62** Benzyltriphenylphosphonium salts as radical precursors using photoredox catalysis

**Dickinson, Sidney**

**6** Dropsonde Design, Calibration, Testing, and Development of Novel Data Analysis Techniques for Multipoint Mapping of Thunderstorm Electrical Structures

**Fischer, Cameron; Hanson, Cole; Schuster, William**

**66** Plant Extraction Method Development for Consumer Product Chemicals  
**Frandle, Bethany; Serrano, Bella**

**19** Fibonacci Sequence and Golden Ratio in Visual Art and Media  
**Frank, Olivia**

**21** Crisis Communication in Theatre  
**Gatz, Zoe**

**14** A Multi-Component Reading Intervention for a Student with Autism Spectrum Disorder  
**Gegare, Shannon**

**49** Using Deep Learning Software to Analyze Zebrafish Eye Movements and Assess Optic Nerve Regeneration  
**Gorman, Ashley; Wulf, Claire**

**39** Effect of a Six-Week Strength Training Program on Speed, Strength, and Power in Collegiate Club Ice Hockey Players  
**Green, Thomas**

**3** The Tempest: An Analysis of Power and Relationships  
**Halfmann, Emily**

**57** The Effect of Microgravity on the Life Cycle of Temperate Bacteriophages  
**Hallstrom, Andrew; Iqbal, Qasim**

**54** Cladistic Ontogeny of Homo sapiens  
**Harper, Chloe**

**25** The Influencer Impact: An Analysis on Influencer Culture and the Business World  
**Hernandez, Giovanna**

**46** The Effects of Unstructured Active Recovery Period on Physical Performance  
**Herrmann, Lauren**

**69** Culture and Development of Illness Causation Understanding in Chinese and American Children  
**Hu, Christina**

**12** Comparing Photometric and Spectroscopic Redshifts of SNe-Hosting Galaxies in the DES  
**Jocham, Andrew; Quashnock, Jean**

**11** Modeling Binary Compact Object Merger Events Detected by the LIGO and Virgo Gravitational Wave Observatories  
**Jocham, Andrew; Schuster, William; Valentini, Andrew; Hoskinson, Chance; Quashnock, Jean**

**51** Comparing Physiological Factors Involved in Perceived Threats in BI Individuals  
**Kaplan, Jordyn**

**8** Athena and the Furies  
**Kherani, Sahar**

**45** What is the Effect of Sleep Duration on the Severity of Injury in Collegiate Athletes with a Lateral Ankle Sprain?  
**Lacrosse, Alexandre**

**2** The Furies and the Never-Ending Fire  
**Leppiaho, Madelyn**

**22** Essential Characteristics in Musical Theater Voice Timbre  
**Liang, Wanying**

**23** The Impact of Video Modeling on the Academic Performance of Students with Disabilities: A Literature Review  
**Liang, Wanying**

**62** Women and Their Worth: Growth and Opportunity in Women's Professional Sports  
**Link, Jenna**

## Celebration of Scholars

**48** An Evaluation of the Effectiveness of Physical Therapy Treatments  
**Matarangas, LEMONIA**

**28** The Influence of Crime on Business Investment/The Economy  
**May, Peyton**

**44** Does the Use of Semi-Rigid Ankle Braces Rather Than Ankle Taping Increase Patient Satisfaction After Return to Play from an Ankle Sprain in Collegiate Athletes?  
**Menconi, Delanie**

**41** Return to Play Protocols in Post-COVID-19 Student Athletes  
**Midlock, Hannah**

**59** Adventures of Rick and MortySmith: The Sequencing and Annotation of the Bacteriophage MortySmith, Genome  
**Pacocha, Allison; Krzewinski, Myles; Kreuziger, Emma; Henneman, Ryan; Del Alcazar, Ryan; Leo, Jessica**

**17** The Persistence and Change of Senpai/Kohai Relationship of Native Japanese Speakers in the United States  
**Parker, Mira**

**31** Analysis of the LPGA's Drive On Campaign  
**Plankey, Samantha**

**7** Rousseau's Discourses: Development of Original Man to Sociable Man  
**Potters, Mallory**

**18** Fashion and Feminism  
**Price, Aleah**

**40** The Relationship Between GPS Derived Training Loads and Session Rating of Perceived Exertion in Women's College Soccer  
**Pustina, Andrew**

**38** Nutritional Knowledge and Athletic Performance  
**Radley, Alana**

**5** Investigating Diversity, Equity, and Inclusion in Statistics and Data Science Courses  
**Rahmel, Elizabeth; Rehder, Lydia; Ball, Jordan**

**26** Female-Led Industry: Women in Media with a Case Study on Hello Sunshine  
**Redalen, Sara**

**58** Characterization of Johnathan's Phams  
**Richter, Victoria; Vejvoda, John; Gonzalez, Hilda; Pettinger, Ella; Hallstrom, Andrew**

**72** Environmental Attitudes and the Theory of Planned Behavior: An Experimental Behavioral Intervention  
**Rodway, Alyssa**

**52** The Effects of Stress Vulnerability Factors on Perceived Stress in Human Participants  
**Saperston, Callie**

**61** Development of an Enzyme-Based Detection Method to Study Potato Virus Y  
**Schafer, Madison**

**24** The Woman Who Never Stopped Learning: Biographical and Professional Review of Elizabeth Green  
**Schneyr, Bailey**

**15** Coping with COVID: Teaching and Learning in a Pandemic  
**Sconzert, Karin**

**37** Comparison of Vegan and Omnivore Diets on Endurance Athlete Performance  
**Self, Emma**

**29** Unprecedented Growth Flying Under the Radar: TTI's Growth and Navigation Through the COVID-19 Pandemic  
**Shawhan, Zachary**

**4** Implementing Sustainability Tools at Carthage  
**Shulman, Sophie; Wheeler, Victoria**

**60** Discovery of Antimicrobial-Producing Bacteria: A Tiny Earth Project  
**Sturino, Sydney; Albers, Andrew**

**43** Standardization of Care: Pressure Ulcers  
**Swanson, Emily**

**27** A Study of How Individuals Embrace The Entrepreneurial Lifestyle and The Importance of Vision Leadership In The Future Algorithmic Economy  
**Thomas, Michael**

**9** The Bible as Interpreted through Jean-Jacques Rousseau's Second Discourse  
**Valentini, Andrew**

**10** Determining the Masses of Black Holes and Neutron Stars Seen in Merger Events Detected by the LIGO and Virgo Gravitational Wave Observatories  
**Valentini, Andrew; Jocham, Andrew; Hoskinson, Chance; Schuster, William; Quashnock, John**

**20** Performance for and with the Camera: Grounded in Humor and Meditative Practice  
**Van Winkle, Jojin**

**32** Forward Progress: The Impact of Technology on Game-Day Experiences in the NFL  
**Wachowiak, Katie**

**68** Children's understanding of death and afterlife in different cultures  
**Walsh-Grant, Petula**

**47** Effect of Electrical Stimulation on Pitchers' Recovery  
**Willett, Matthew**

**64** Radical Halogenation of Sclareolide Using Photocatalysis  
**Wilson, David**



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