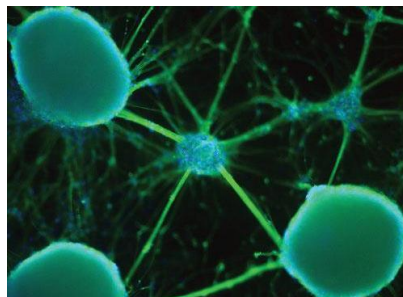
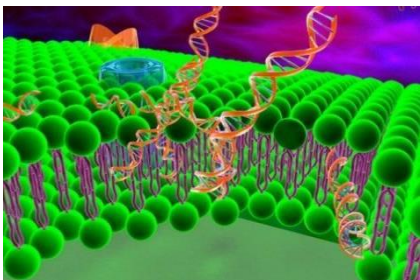


Iowa State University



13th SYMPOSIUM ON UNDERGRADUATE RESEARCH & CREATIVE EXPRESSION

April 17, 2019

<http://www.undergradresearch.iastate.edu/symposium/>

Program Overview

8:00 – 9:00 **REGISTRATION AND BREAKFAST**, Memorial Union, Pioneer Room

9:00 – 9:20 **OPENING**, Memorial Union, Gallery Room

Welcome: Dr. Svitlana Zbarska, Undergraduate Research Program Coordinator

Opening remarks: Dr. Guru Rao, Associate Vice President for Research

9:30 – 10:45 **SESSION I** (*concurrent presentations*)

I.A – Animal Science

Memorial Union, Gallery Room

I.B – Political Science and Spanish

Memorial Union, Room 3534

I.C – History and Economics

Memorial Union, Room 3558

I.D – Computer and Software Engineering

Memorial Union, Room 3505

I.E – Architecture

Memorial Union, Oak Room

I.F – Biochemistry

Memorial Union, Cardinal Room

I.G – Microbiology & Genetics

Memorial Union, Room 3512

10:45 – 11:00 **Break & Refreshments**, Memorial Union, Pioneer Room

11:00 – 12:00 **SESSION II** (*concurrent presentations*)

II.A – Biosystems Engineering

Memorial Union, Cardinal Room

II.B – Physics

Memorial Union, Room 3505

II.C – Sociology

Memorial Union, Gallery Room

II.D – Community and Regional Planning

Memorial Union, Room 3512

II.E – Entomology

Memorial Union, Room 3558

II.F – Kinesiology and Health

Memorial Union, Oak Room

II.G – Environmental Studies

Memorial Union, Room 3534

II.H – Psychology and Mass Communication

Memorial Union, Gold Room

12:00 – 1:00 Lunch, Memorial Union, Sun Room

Key speaker presentation: “Life Lessons From a Circuitous Career”, Dr. James Oliver, Director of the ISU Student Innovation Center, professor at the Department of Mechanical Engineering, Iowa State University

1:00 – 2:15 SESSION III (*concurrent presentations*)

III.A – Materials Engineering

Memorial Union, Room 3534

III.B – Mechanical Engineering

Memorial Union, Oak Room

III.C – Psychology

Memorial Union, Cardinal Room

III.D – Electrical Engineering

Memorial Union, Room 3505

III.E – Civil Engineering

Memorial Union, Room 3558

III.F – Kinesiology and Health

Memorial Union, Room 3512

III.G – Microbiology

Memorial Union, Gold Room

III.H – Environmental Science

Memorial Union, Gallery Room

2:15 – 2:30 Break & Refreshments, Memorial Union, Pioneer Room

2:30 – 3:30 SESSION IV (*concurrent presentations*)

IV.A – Chemistry

Memorial Union, Cardinal Room

IV.B – Aerospace and Mechanical Engineering

Memorial Union, Gallery Room

IV.C – Food Science and Human Nutrition

Memorial Union, Oak Room

IV.D – Genetics and Microbiology

Memorial Union, Room 3512

IV.E – Agronomy and Environmental Science

Memorial Union, Room 3558

IV.F – Political Science and Mass Communication

Memorial Union, Gold Room

IV.G – Biology and Animal Ecology

Memorial Union, Room 3534

IV.H – Industrial Engineering and Design

Memorial Union, Room 3505

3:00 – 5:00 POSTER SESSION, Memorial Union, Great Hall

Each presentation is allotted 15 minutes. Participants and guests are asked to not enter or leave the rooms during presentations.

A Message from the Undergraduate Research Program

Welcome to the Iowa State University's 13th Annual Symposium on Undergraduate Research & Creative Expression. The Symposium provides undergraduates from all academic disciplines with an opportunity to share their research with the university community and other guests through oral and poster presentations. Near 190 students from all Iowa State University colleges will present about 130 research projects. More than 50 Iowa State faculty members will participate as faculty moderators to provide feedback to presenters. More than 80 student volunteers from the University Honors Program will assist in running the symposium. The Symposium represents part of a large effort of Iowa State University to enhance, support and celebrate undergraduate research activity.

The students selected for this year's Symposium and their mentors represent all the Colleges at Iowa State University: Agricultural & Life Sciences, Business, Design, Engineering, Human Sciences, Liberal Arts & Sciences and, Graduate and Veterinary Medicine.

We hope you enjoy the day!

Svitlana Zbarska

Symposium Coordinator

ISU Undergraduate Research program coordinator campus-wide

SESSION I, 9:30 – 10:45 am

Session I.A
9:30 – 10:45
Gallery Room

ANIMAL SCIENCE

Faculty Moderator: Joshua Selsby, Animal Science

- I.A.1 **Effect Of Two Dietary Copper Treatments On Implant Performance Response And Carcass Characteristics Of Finishing Beef Steers**
Presenter: *Summer Castillo*, Animal Science
Mentor: Stephanie Hansen, Animal Science
- I.A.2 **In Situ Fiber Digestibility of Soybean Meal and DDGS Pelleted with Corn Stover Compared to Pelleted Corn Gluten Feed for Dairy Cows**
Presenter: *Miranda Clausen*, Animal Science
Mentor: Hugo Ramirez-Ramirez, Dairy Nutrition
- I.A.3 **The Effects of Dietary Protein Oxidation on Growing Pigs**
Presenter: *Erika Johnson*, Animal Science
Mentor: Mariana Rossoni-Serao, Animal Science

Session I.B
9:30 – 10:45
Room 3534

POLITICAL SCIENCE

Faculty Moderator: Mack Shelley, Political Science

- I.B.1 **Blackness in Latin America: Current Racial Discourse and the Role of the Census**
Presenter: *Nayely Hurtado*, Political Science, Spanish
Mentor: Elisa Rizo, World Languages & Cultures
- I.B.2 **Tracking Second Language Phonetic Learning in Spontaneous Speech**
Presenter: *Shelby Bruun*, Spanish and International Studies
Mentor: Charles Nagle, World Languages and Cultures

Session I.C
9:30 – 10:45
Room 3558

HISTORY AND ECONOMICS

Faculty Moderator: Diane Janvrin, Accounting

- I.C.1 **Measuring Farm Size in the United States, 1959-2012**
Presenter: *Skyler Schneekloth*, Economics and History
Mentor: Peter Orazem, Economics
- I.C.2 **Carrie Chapman Catt: Contextualizing Controversy**
Presenter: *Crystal Brandenburgh*, History
Mentor: Stacy Cordery, History
- I.C.3 **Erwin Panofsky's Iconography in the Interpretation of The Sixth Patriarch Chopping Bamboo**
Presenter: *Jiu Cao*, Visual Culture Study
Mentor: John Cunnally, Visual Culture Study

Session I.D
9:30 – 10:45
Room 3505

COMPUTER AND SOFTWARE ENGINEERING

Faculty Moderator: Aleksandar Dogandzic, Electrical Engineering and Computer Science

I.D.1 **Investigating and Modeling a Network of Embedded Systems**

Presenter: *Modeste Kenne*, Computer Engineering

Mentor: Phillip Jones, Electrical and Computer Engineering

I.D.2 **Let The Device Talk**

Presenter: *Yealim Sung*, Software Engineering

Mentor: Mai Zheng, Electrical and computer Engineering

Session I.E
9:30 – 10:45
Oak Room

ARCHITECTURE

Faculty Moderator: Andrea Wheeler, Architecture

I.E.1 **Creating E-Footprints: A Case Study In Creating Virtual Space For Environmental Learning**

Presenter: *Evan Harrison*, Architecture

Mentor: Alenka Poplin, Community and Regional Planning

I.E.2 **Entertainment Spaces 2.0**

Presenter: *Shivang Patel*, Architecture

Mentor: Lynn Paxson, Architecture

I.E.3 **Museum of Islamic Art in Qatar by Pei: Tradition and Modernization in Islamic Architecture**

Presenter: *Rami Mannan*, Architecture

Mentor: Jelena Bogdanovic, Architecture

Session I.F
9:30 – 10:45
Cardinal Room

BIOCHEMISTRY

Faculty Moderator: Stone Chen, Biochemistry

I.F.1 **Determinants of Membrane Association in the Synaptic GTPase-Activating Protein SynGAP**

Presenter: *Sarah Zelle*, Biochemistry and Genetics

Mentor: Eric Underbakke, Biochemistry

I.F.2 **Understanding the Binding Affinity of Neutrophil Gelatinase-Associated Lipocalin with DNA Aptamer**

Presenter: *Sam Coder*, Biochemistry

Mentor: Marit Nilsen-Hamilton, Biochemistry, Biophysics and Molecular Biology

I.F.3 **Response of different length of LCN2 promoter to LPS.**

Presenter: *Hiroki Hasebe*, Biochemistry

Mentor: Marit Nilsen-Hamilton, Biochemistry, Biophysics and Molecular Biology

Session I.G
9:30 – 10:45
Room 3512

MICROBIOLOGY AND GENETICS

Faculty Moderator: Aubrey Mendonca, Food Science and Human Nutrition

- I.G.1 **Autophagy Importance in Podocyte Homeostasis in Drosophila**
Presenter: Rachel Mehmert, Biology
Mentor: Hua Bai, Genetics Development and Cell Biology
- I.G.2 **Analysis of the P97 and P102 Gene Families in Mycoplasma Hypopneumoniae Isolates**
Presenter: Morgan Smith, Software Engineering and Microbiology
Mentors: Iddo Friedberg, Chris Minion, Veterinary Microbiology and Preventive Medicine
- I.G.3 **Examining The Functional Role Of Micrnas Implicated In Hypermobile Ehlers-Danlos Syndrome In Maintaining Connective Tissue Morphology**
Presenter: Scarlett Eagle, Genetics
Mentor: Elizabeth McNeill, Food Science and Human Nutrition

SESSION II, 11:00 am – 12:00 pm

Session II.A
11:00 – 12:00
Cardinal Room

BIOSYSTEMS ENGINEERING

Faculty Moderator: Jacek Koziel, Agricultural and Biosystems Engineering

- II.A.1 **Effects of Hydraulic Residence Time on Water Quality in Woodchip Bioreactors**
Presenter: Kyle Werning, Biosystems Engineering
Mentor: Michelle Soupir, Agricultural and Biosystems Engineering
- II.A.2 **Examining Implications of Climate Change for Food Security in the U.S. Midwest: A Geospatial Analytics Approach**
Presenter: Angie Burke, Biosystems Engineering
Mentor: U. Sunday Tim, Agricultural and Biosystem Engineering
- II.A.3 **UV Light Treatment of Barn Inlet Air to Mitigate PRRS Transmission**
Presenter: Peiyang Li, Biosystems Engineering and Environmental Science
Mentor: Jacek Koziel, Agricultural and Biosystems Engineering

Session II.B
11:00 – 12:00
Room 3505

PHYSICS

Faculty Moderator: Ian Schneider, Chemical and Biological Engineering

- II.B.1 **Exploring New Source Classification Methods in Infrared Astronomy with Machine Learning**
Presenter: Jacqueline Blaum, Physics and Computer Science
Mentor: Rafael Martinez-Galarza, Smithsonian Astrophysical Observatory, Harvard-Smithsonian Center for Astrophysics
- II.B.2 **Particle Hole Symmetry Breaking in Cuprate Superconductors**
Presenter: Daniel Russell, Physics
Mentor: Adam Kaminski, Physics

Session II.C
11:00 – 12:00
Gallery Room

SOCIOLOGY

Faculty Moderator: Sree Nilakanta, Supply Chain and Information Systems

- II.C.1 **Law And Policies Regarding Stepfamily Relationships: A Patchwork Quilt**
Presenter: *Elcy Timothy*, Sociology and Political Science
Mentor: Susan Stewart, Sociology
- II.C.2 **An In-Progress Look at the State of Sexual Violence Knowledge on Iowa State's Campus**
Presenter: *Emily Hammer*, Marketing and Management
Mentor: Alissa Stoehr, Sociology
- II.C.3 **Utilizing the Push-Pull Theory to Explore Green Event Attendees' Motivations**
Presenter: *Yu Ye*, Event Management
Mentor: Ching-Hui Su, Apparel, Events, and Hospitality Management
- II.C.4 **Predicting Shifts In Iowa Farmers' Climate Change Beliefs And Attitudes Toward Climate Action Over Time**
Presenter: *Sara Ronnkvist*, Statistics
Mentor: J. Gordon Arbuckle, Jr, Sociology

Session II.D
11:00 – 12:00
Cardinal Room

COMMUNITY AND REGIONAL PLANNING

Faculty Moderator: Ted Grevstad-Nordbrock, Community and Regional Planning

- II.D.1 **The Case for Car-Free Communities**
Presenters: *Zoey Mauck*, Landscape Architecture and Community and Regional Planning
Mentor: Ben Shirtcliff, Design
- II.D.2 **Examination of Economic Resilience and Regional Capacity in the Midwest**
Presenter: *Stuart Burzette*, Community and Regional Planning and Environmental Science
Mentor: Monica Haddad, Community and Regional Planning

Session II.E
11:00 – 12:00
Room 3558

ENTOMOLOGY

Faculty Moderator: Sue Blodgett, Entomology

- II.E.1 **Stress Related Protein Expression in Honeybees**
Presenter: *Roslyn Gray*, Biology and Women's and Gender Studies
Mentor: Amy Toth, Ecology, Evolution, and Organismal Biology
- II.E.2 **Mirror-Induced Behavior in Paper-Wasps: Is an Insect Capable of Self-Recognition?**
Presenter: *Jessica Riojas*, Environmental Science and Biology
Mentor: Amy Toth, Ecology, Evolution, and Organismal Biology

Session II.F
11:00 – 12:00
Oak Room

KINESIOLOGY AND HEALTH

Faculty Moderator: Elizabeth Stegemoller, Kinesiology

- II.F.1 **Cardiovascular Function and Stress in Parkinson's Disease**
Presenters: *Rebekah Trost*, Kinesiology and Health, *Cailie Logue*, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology
- II.F.2 **Changes in Cognitive Processing, Working Memory, and Anhedonia in Response to Exercise in Individuals with Major Depressive Disorder**
Presenter: *Jenna King*, Kinesiology and Health
Mentor: Jacob Meyer, Kinesiology
- II.F.3 **Associations of Cardiorespiratory Fitness and Muscular Strength with Mental Cognition in Older Adults**
Presenter: *Tilak Patel*, Kinesiology
Mentor: Angelique Brellenthin, Kinesiology
- II.F.4 **Effect of Music and Exercise on Motor Function in People with Parkinson's Disease**
Presenters: *Mikayla Weron*, Kinesiology and Health, *Claire Bridges*, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology

Session II.G
11:00 – 12:00
Room 3534

ENVIRONMENTAL SCIENCE

Faculty Moderator: Rachel Eike Apparel, Events and Hospitality Management

- II.G.1 **Capturing Iowa Lakeside Lab's Dark Data**
Presenter: *Sydney Weldon*, Biology
Mentor: Lori Biederman, Ecology, Evolution and Organismal Biology
- II.G.2 **Balancing Conservation And Economics To Improve Water Quality In Iowa And Beyond**
Presenter: *Lucas Goodman*, Animal Ecology and Environmental Studies
Mentor: Thomas Isenhardt, Natural Resource Ecology and Management

Session II.H
11:00 – 12:00
Gold Room

PSYCHOLOGY AND MASS COMMUNICATION

Faculty Moderator: Christina Svec, Music and Theatre

- II.H.1 **Assessing Empathy in Persuasive Health, Environment and Risk Communication**
Presenters: *Emily Haberlack*, Environmental Science, Environmental Studies, and Sociology
Mentor: Dara Wald, Greenlee School of Journalism and Communication
- II.H.2 **Exploring Relations Between Dark Personality Traits, Media Violence Exposure, and Finding Humor in Media Violence**
Presenter: *Sabrina Ash*, Psychology
Mentor: Craig Anderson, Psychology

SESSION III, 1:00 pm – 2:15 pm

Session III.A

1:00 – 2:15

Cardinal Room

MATERIALS ENGINEERING

Faculty Moderator: Svitlana Zbarska, Undergraduate Research program coordinator

- III.A.1 **Development of Copper Based Elastocaloric Materials**
Presenter: *Emery Farmer*, Material Science and Engineering
Mentor: Jun Cui, Material Science and Engineering
- III.A.2 **Optimization of Mixed Glass Former/Mixed Anion Glassy Electrolytes through the Utilization of Planetary Ball Milling**
Presenter: *Onel Valdez*, Materials Science Engineering
Mentor: Steven Kmiec, Materials Science Engineering
- III.A.3 **A Study of Kinetic Fragility Along the Na₄P₂S₇-xO_x Glass Series**
Presenter: *Jacob Lovi*, Materials Engineering
Mentor: Steve Martin, Materials Science and Engineering
- III.A.4 **Fueling Space Exploration: Engineering Materials to Produce Rocket Fuel on Mars**
Presenter: *Brandon Vance*, Chemical Engineering
Mentor: Jean-Philippe Tessonier, Chemical and Biological Engineering

Session III.B

1:00 – 2:15

Oak Room

MECHANICAL ENGINEERING

Faculty Moderator: James Michael, Mechanical Engineering

- III.B.1 **Creating Repeatable Shock Wave Pressures Using a Customized Scoring Device for Diaphragms**
Presenter: *Megan Beck*, Mechanical Engineering
Mentor: Sarah Bentil, Mechanical Engineering
- III.B.2 **Parametric Modeling and Design of Tricuspid Heart Valves**
Presenter: *Caroline Crisp*, Mechanical Engineering
Mentor: Ming-Chen Hsu, Mechanical Engineering

Session III.C

1:00 – 2:15

Cardinal Room

PSYCHOLOGY

Faculty Moderator: Susan Yager, English

- III.C.1 **Do Jurors Need Less Evidence To Convict Minority Defendants?**
Presenter: *Natalie Teclaw*, Psychology, Criminal Justice, and Sociology
Mentor: Kristen Slapinski, Psychology
- III.C.2 **Exploring Relations Between Dark Personality Traits, Media Violence Exposure, and Finding Humor in Media Violence**
Presenter: *Sabrina Ash*, Psychology
Mentor: Craig Anderson, Psychology

III.C.3 **Abriendo Caminos: Promoting Healthy Family Mealtime Routines and Climate Among Mexican Immigrant Families**

Presenter: *Alondra Sanchez-Laguna*, Bachelor of Liberal Studies

Mentor: Kimberly Greder, Human Development and Family Studies

Session III.D
1:00 – 2:15
Room 3505

ELECTRICAL ENGINEERING

Faculty Moderator: Ratnesh Kumar, Electrical and Computer Engineering

III.D.1 **Comparison between FlexiForce Sensors and a Low-cost Capacitive Force Sensor Exposed to a Shock Wave**

Presenter: *Marcelo Christhiam Gomes Abrantes*, Electrical Engineering

Mentor: Sarah Bentil, Mechanical Engineering

III.D.2 **Identifying Cancerous Images Using Neural Networks**

Presenters: *Mohamed Gesalla*, Electrical Engineering

Mentor: Julia Dickerson, Electrical and Computer Engineering

Session III.E
1:00 – 2:15
Room 3558

CIVIL ENGINEERING

Faculty Moderator: Claus Kadelka, Mathematics

III.E.1 **TIMELI: Using Data Analysis to Improve Traffic Safety**

Presenter: *Philip Cordova*, Computer Science

Mentor: Anuj Sharma, Civil, Construction, and Environmental Engineering

III.E.2 **Pavement Thermodynamics at Great Mosque of Makkah, Saudi Arabia**

Presenter: *Shatha Alghamdy*, Civil Engineering

Mentor: James Alleman, Civil, Construction and Environmental Engineering

III.E.3 **Optimizing Maintenance Equipment Life Cycle for Local Agencies**

Presenter: *Caria Collins*, Civil Engineering

Mentor: Jennifer Shane, Civil Engineering

Session III.F
1:00 – 2:15
Room 3512

KINESIOLOGY AND HEALTH

Faculty Moderator: Rudy Valentine, Kinesiology

III.F.1 **Peer Health Coaching for Physical Activity, Self-Efficacy, and Stress in College Students**

Presenter: *Kylee Joiner*, Kinesiology and Health and Global Resource Systems

Mentor: Gregory Welk, Kinesiology

III.F.2 **The Effects of Boxing Therapy on Upper Extremity Muscle Activity in Persons with Parkinson's Disease**

Presenters: *Thomas Berta*, Kinesiology, *Matthew Turk*, Kinesiology

Mentor: Elizabeth Stegemoller, Kinesiology

Session III.G
1:00 – 2:15
Gold Room

MICROBIOLOGY

Faculty Moderator: Mark Rasmussen, Microbiology

- III.G.1 **Effect Of Repeated Low-Level Hydrogen Sulfide Exposure On Pathogenicity Of Influenza- A Virus In Pigs**
Presenter: *Amber Vegter*, Biology and Animal Science
Mentor: Wilson Rumbelha, Veterinary Diagnostic and Production Animal Medicine
- III.G.2 **Synthesis of a mRNA vs protein vaccine: a possible treatment to prevent human parainfluenza virus in children**
Presenter: *Natalie Lohmann*, Biology
Mentor: David Verhoeven, Veterinary Microbiology and Preventive Medicine
- III.G.3 **Assessing The Growth Of *Fusarium Virguliforme* On Culture Media Amended With Crop Residues**
Presenter: *Cristian Olmos*, Microbiology
Mentor: Leonor Leandro, Plant Pathology and Microbiology

Session III.H
1:00 – 2:15
Gallery Room

ENVIRONMENTAL SCIENCE

Faculty Moderator: Laura Merrick, Agronomy

- III.H.1 **Late Quaternary Fire and Hydroclimate at the Southern Limit of the North American Temperate Tallgrass Prairie.**
Presenter: *Jacqueline Galang*, Environmental Science
Mentor: Hannah Carroll, Ecology, Evolution and Organismal Biology
- III.H.2 **Application Of Heat-Flow Modeling To Estimate Hydraulic Conductivity In The Ames Aquifer**
Presenter: *Thomas Doyle*, Environmental Science
Mentor: William Simpkins, Geological And Atmospheric Sciences
- III.H.3 **The Impacts of Diverting Water by Hand-Dug Channels in the Nile Watershed on Agriculture, Food Security, and Water Management in the Kamuli District of Uganda**
Presenter: *Hannah Baysinger*, Global Resource Systems, Environmental Studies, Spanish
Mentor: Emily Zimmerman, Horticulture
- III.H.4 **Tracking e. Coli and Phosphorus Pollution in an Urban-Rural Watershed**
Presenter: *Colin Welk*, Environmental Science
Mentor: Laura Merrick, Agronomy

SESSION IV, 2:30 pm – 3:30 pm

Session IV.A
2:30 – 3:30
Cardinal Room

CHEMISTRY

Faculty Moderator: Joshua Peschel, Agricultural and Biosystems Engineering

- IV.A.1 **Structure and Synthesis of Rare Earth Tetrel Prnctides**
Presenter: *Brennan McBride*, Chemistry
Mentor: Kirill Kovnir, Chemistry

- IV.A.2 **Synthesis And Crystal Structure Of Novel AuGeP Compound**
Presenter: *Juyeon Won*, Chemistry
Mentor: Shannon Lee, Chemistry
- IV.A.3 **Use of Image Quality Scores to Determine Fingerprint Age in MALDI Imaging**
Presenter: *Madison Thomas*, Chemistry
Mentor: Young-Jin Lee, Chemistry
- IV.A.4 **Ion Concentration Polarization In A Simple Paper Device For Tear Analysis**
Presenter: *Dorian Twedt*, Chemistry
Mentor: Robbyn Anand, Chemistry

Session IV.B
 2:30 – 3:30
 Gallery Room

AEROSPACE AND MECHANICAL ENGINEERING

Faculty Moderator: Bella Kim, Aerospace Engineering

- IV.B.1 **Runtime Verification Benchmark Generation for MLTL Properties via SAT and SMT**
Presenter: *Josh Wallin*, Computer Engineering and Spanish
Mentor: Kristin Rozier, Aerospace Engineering
- IV.B.2 **Investigating Earth's Magnetic Field with a CubeSat Fleet**
Presenter: *Alex Scott*, Aerospace Engineering
Mentor: Ossama Abdelkhalik, Aerospace Engineering
- IV.B.3 **Autonomous Entry, Descent, and Landing (EDL) Guidance Strategies for a Human Mission to Mars**
Presenter: *Richard Hoobler*, Aerospace Engineering
Mentor: Dae Young Lee, Aerospace Engineering
- IV.B.4 **Gas-Turbine Performance Optimization Utilizing Surrogate Management Framework And Fluid-Structure Interaction**
Presenter: *Nikita Kozak*, Mechanical Engineering
Mentor: Ming-Chen Hsu, Mechanical Engineering

Session IV.C
 2:30 – 3:30
 Oak Room

FOOD SCIENCE AND HUMAN NUTRITION

Faculty Moderator: Don Beitz, Biochemistry, Biophysics and Molecular Biology/Animal Sciences

- IV.C.1 **The Impact Of Compulsive Ethanol Consumption On Gut And Brain Neurochemicals**
Presenter: *Allyse Shoeman*, Nutritional Science
Mentor: Peter Clark, Food Science and Human Nutrition
- IV.C.2 **Nutritional Outcomes of Mothers and Children in a Community-Based Malnutrition Management Program**
Presenter: *Nyahon Both*, Dietetics
Mentor: Dorothy Masinde, Horticulture
- IV.C.3 **Defining Dairy Consumption in Pregnant Women Living in Central Iowa**
Presenter: *Jessica Lundberg*, Dietetics
Mentor: Christina Campbell, Food Science and Human Nutrition

Session IV.D
2:30 – 3:30
Room 3512

GENETICS AND MICROBIOLOGY

Faculty Moderator: Donald Sakaguchi, Genetics, Development and Cell Biology

- IV.D.1 **Optimizing CRISPR interference for Conditional Gene Regulation in Malaria Parasites**
Presenter: *Ellen Meis*, Biology and Environmental Science
Mentor: Josh Beck, Biomedical Sciences
- IV.D.2 **Recovery of Adult Neural Progenitor Cells from Alginate Hydrogels**
Presenter: *Laura Pesquera Colom*, Biology
Mentor: Donald Sakaguchi, Genetics, Development and Cell Biology
- IV.D.3 **Investigation Of Cell-Seeded Gelatin Scaffolds As A Novel Cell Transplantation Strategy Using Zebrafish As A Model System**
Presenter: *Marissa Roghair*, Genetics, Microbiology
Mentor: Donald Sakaguchi, Genetics, Development and Cell Biology
- IV.D.4 **Assessment Of Neural Stem Cell Proliferation And Migration For Regeneration Therapies**
Presenter: *Amy Stark*, Genetics
Mentor: Donald Sakaguchi, Genetics, Development and Cell Biology

Session IV.E
2:30 – 3:30
Room 3558

AGRONOMY AND ENVIRONMENTAL SCIENCE

Faculty Moderator: Brian Hornbuckle, Agronomy

- IV.E.1 **Are Yield Increases In Fertilized Biomass Crops Worth Reductions In Water Quality?**
Presenter: *Tyler Donovan*, Agronomy
Mentor: Emily Heaton, Agronomy
- IV.E.2 **Investigation of Discrepancies between Methods of Quantifying Soil Nitrogen in Agricultural Fields**
Presenter: *Christina Meadows*, Environmental Science and Geology
Mentor: Michael Castellano, Agronomy
- IV.E.3 **Determining When Tillage or Crop Effects are Dominant to Make Satellite Soil Moisture Work in Iowa**
Presenter: *Luke Sloterdijk*, Global Resource Systems and Environmental Science
Mentor: Brian Hornbuckle, Agronomy

Session IV.F
2:30 – 3:30
Gold Room

POLITICAL SCIENCE AND MASS COMMUNICATION

Faculty Moderator: Svitlana Zbarska, Undergraduate Research program coordinator

- IV.F.1 **#BlackBoyJoy: Visual Framing on Twitter**
Presenter: *Julian Neely*, Journalism and Mass Communication
Mentor: Daniella Dimitrova, Greenlee School of Journalism
- IV.F. **Examining and Analyzing Institutional Discourse on Twitter: Engaging Prospective Students**
Presenter: *Nayelie Valenzuela*, Public Relations
Mentor: Daniela Dimitrova, Greenlee School of Journalism and Communication

Session IV.G
2:30 – 3:30
Room 3534

BIOLOGY AND ANIMAL ECOLOGY

Faculty Moderator: Jodi McGill, Veterinary Microbiology and Preventive Medicine

- IV.G.1 **Evaluating The Efficacy Of Autonomous Recording Units For Fall Northern Bobwhite Surveys**
Presenter: *Kyla Yuza-Pate*, Animal Ecology
Mentor: Adam Janke, Natural Resource Ecology and Management
- IV.G.2 **Understanding Interactions Between Avian Seed Dispersers and Landscapes: A Case Study of Guam.**
Presenter: *Ethan Rose*, Biology and Animal Ecology
Mentor: Hugo Thierry, Ecology, Evolution and Organismal Biology
- IV.G.3 **Epigenetic Effects of Environmental Contaminants on Turtles with Temperature-Dependent Sex Determination**
Presenter: *Victoria Villanueva*, Biology
Mentor: Fredric Janzen, Ecology, Evolution and Organismal Biology

Session IV.H
2:30 – 3:30
Room 3505

INDUSTRIAL ENGINEERING AND DESIGN

Faculty Moderator: Azadeh Sheidaei, Aerospace Engineering

- IV.H.1 **Analyzing Power Tools with an Ergonomic Perspective**
Presenter: *Christopher Hernandez*, Industrial Engineering
Mentor: Richard Stone, Industrial and Manufacturing Systems Engineering
- IV.H.2 **Empathy in Design: How does diversity of personas affect creativity?**
Presenter: *Eric Diaz*, Mechanical Engineering
Mentor: Tejas Dhadphale, Industrial Design

POSTER SESSION, 3:00 pm – 5:00 pm

Poster Session
3:00-5:00
Great Hall

POSTER SESSION

- P.1 **Gait and Music EMG**
Presenters: *Callan Barrick*, Kinesiology, *Teagan Manus*, Kinesiology, *Marissa Koepp*, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology
- P.2 **Analysis of Iowa Public Universities' Financials' Impact on Tuition Prices from 1990-2018**
Presenters: *Brandon Beecham*, Biology
Mentor: Diane Janvrin, Accounting
- P.3 **Comparison of Cytokine Expression in Healthy Older Adults and People with PD**
Presenters: *Alaina Berg*, Biology, *Chirayu Shukla*, Biology
Mentor: Elizabeth Stegemoller, Kinesiology
- P.4 **Exploring Wearable Technology: Prototyping of Solar Powered Book Bags**
Presenter: *Courtney Beringer*, Mechanical Engineering
Mentor: Eulanda Sanders, Apparel, Events and Hospitality Management

- P. 5 **The Effects of Boxing Therapy on Upper Extremity Muscle Activity in Persons with Parkinson's Disease**
Presenter: *Thomas Berta*, Kinesiology, *Matthew Turk*, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology
- P.6 **Helping Health Care Professionals Understand Social Support Communication Needs for Parents of Children Living With Complex Chronic Conditions**
Presenters: *Sydney Ellis*, Spanish and Psychology, *Nicole Miller*, Communication Studies
Mentor: Katherine Rafferty, Psychology
- P.7 **A Climatology of Near-Storm Parameters for Nine Types of Tornado-Producing Thunderstorms**
Presenter: *Nathan Erickson*, Meteorology
Mentor: William Gallus, Meteorology
- P.8 **Co-creating Sketchnote Visuals with Honors Students**
Presenters: *Haley Grote*, Industrial Design, Pre-Design, *Mary Murphy*, Industrial Design, *Brandon Edwards*, Pre-Architecture, *Carolyn Driskell*, Pre-Graphic Design, *Annaka Ketterer*, Pre-Industrial Design
Mentor: Verena Paepcke-Hjeltness, Industrial Design
- P.9 **Damage, Dislocation, and Displacement of Renter and Immigrant Households after Low Attention Disasters**
Presenters: *Ruben Hernandez*, Community and Regional Planning, *Emily Vaneek*, Community and Regional Planning, *Jasmine Khammany*, Community and Regional Planning
Mentor: Sara Hamideh, Community and Regional Planning
- P.10 **Treatment to Reduce Potentially-Virulent Escherichia coli in the Gut and Prevent Avian Colibacillosis**
Presenters: *Ryley Hoven*, Biology and French, *Mary Kate Horak*, Dietetics
Mentor: Melha Mellata, Food Science and Human Nutrition
- P.11 **Evaluating Criminal Punishments**
Presenters: *Lauren Hudachek*, Psychology, Criminal Justice and Anthropology, *Erin Izer*, Psychology
Mentor: Gary Wells, Psychology
- P.12 **The Role of Trust and Credibility in Public Understanding of Science and Attitudes Toward Scientists**
Presenters: *Madelyn Huinker*, Communication Studies and Environmental Studies, *Katlyn Campbell*, Journalism and Mass Communication
Mentor: Dara Wald, Journalism and Mass Communication
- P.13 **Continuous Remote Attestation for Ultra-Low Power Processors**
Presenters: *Shane Impola*, Computer Engineering, *Bradley Rhein*, Computer Engineering, *Dennis Xu*, Computer Engineering
Mentor: Henry Duwe, Electrical and Computer Engineering
- P.14 **On the Construction of a Gene Regulatory Network Database for Meta-Analyses in Boolean Canalizing Functions**
Presenters: *Jack Kinseth*, Mathematics, *Haris Serdarevic*, Mathematics
Mentor: Claus Kadelka, Mathematics
- P.15 **Lean Gestational Diabetes Mellitus Impacts Ovarian Gap Junction Protein Expression**
Presenter: *Avery Korns*, Animal Science and Animal Ecology
Mentor: Aileen Keating, Animal Science

- P.16 **Manganese mineral pathways in aquatic settings and their use in determining conditions of an ancient lake on mars.**
Presenter: *Gabrielle Ledesma*, Geology
Mentor: Elizabeth Swanner, Geologic and Atmospheric Sciences
- P.17 **The Importance Of Creating Academic And Professional Environments For Multicultural Students In Agriculture**
Presenter: *Adamarie Marquez Acevedo*, Animal Science
Mentor: Elizabeth Martinez Podolsky, Animal Science
- P.18 **IL-17 Contributes To Disease During Mild Brsv Infection In The Neonatal Calf**
Presenters: *Paiton McDonald*, Agricultural Biochemistry, *Madison Porter*, Biology
Mentor: Jodi McGill, Veterinary Medicine and Preventative Microbiology Research
- P.19 **A 3D Printed Airbrush Nozzle Attachment for Investigating Shape Changes of Soft Biological Tissue**
Presenters: *Luke McPherran*, Mechanical Engineering, *Sarah Hansen*, Mechanical Engineering
Mentor: Sarah Bentil, Mechanical Engineering
- P.20 **The Acute and Post-Acute Effects of Concussion Education on the Perceptions and Reporting Intentions of At-Risk Athletes**
Presenter: *Tessa Mendoza*, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology and Health
- P.21 **The Effects of Preferred Activating Music on Cognitive Inhibition**
Presenters: *Allison Meyer*, *Molly Norman*, *Emma Gettes*, *Cortney Elkin*, *Ella Gustafson*, *Jonathan Mennecke*, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology
- P.22 **What Matters More When Controlling Biologically-Available Carbon in Soil: Roots or Management?**
Presenters: *Jack Pieper*, Agronomy and Global Resource Systems
Mentor: Andrew VanLoocke, Agronomy and Marshall McDaniel, Agronomy
- P.23 **Visual Animation of a Spacecraft Detumbling Control Algorithm with JavaScript WebGL**
Presenters: *David Plotnik*, Aerospace Engineering, *Reed Kohlmeyer*, Aerospace Engineering, *Sebastian Johansen*, Mechanical Engineering
Mentor: Ossama Abdelkhalik, Aerospace Engineering
- P.24 **Developing a TRIZ-based Design for Flexibility Tool for Manufacturing Facilities**
Presenters: *Shibani Raje*, Industrial Engineering, *Jenna Oftedal*, Industrial Engineering
Mentor: Leslie Potter, Industrial and Manufacturing Systems Engineering, Gul Kremer, Industrial and Manufacturing Systems Engineering
- P.25 **The Effects of Auditory Cues on Variability in Handwriting**
Presenters: *Anna Reelfs*, *Jamie Halbert*, *Julia Hansen*, *Jamie Stuhr*, *Chloe Barton*, *Nikki Latimer*, *Ashley Miller*, *Gabrielle Woods*, *Andrew Zaman*, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology
- P.26 **Behavioral Differences in Cognitive Inhibition of Aging Musicians and Non-Musicians**
Presenter: *Kate Rumel*, Kinesiology, Pre-Health
Mentor: Elizabeth Stegemoller, Kinesiology

- P.27 **Sensor-based Measurement of Engagement to Inform Industrial Engineering Pedagogy: Preliminary Work**
Presenters: *Daniel Swegle, Jonah Scallon, Trevor Gould*, Industrial and Manufacturing Systems Engineering
Mentor: Leslie Potter, Industrial and Manufacturing Systems Engineering
- P.28 **Mitigating Vibrations in Tall Buildings Under Extreme Wind Events**
Presenters: *Abigail Van Rheenen*, Aerospace Engineering, *Michael Huntley*, Aerospace Engineering, *Paul Iman*, Mechanical Engineering
Mentor: Alice Alipour, Civil, Construction, and Environmental Engineering
- P.29 **An Experimental Design to Estimate the Number of Milkweed Plants Needed to Support Larval Monarch Butterfly Development**
Presenters: *Elke Windschitl*, Animal Ecology and Biology, *Carolyn White*, Biological Systems Engineering and Global Resource Systems, *Kayla Wernsing*, Environmental Science and Geology
Mentor: Steven Bradbury, Entomology
- P.30 **The Relationship Between Finger and Toe Tapping in Persons with Parkinson's Disease**
Presenters: *Ahmed Gamal Abdalla Zied*, Kinesiology & Health, *Cassandra Sardeson*, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology
- P.31 **Water Purification of Bacillus Subtilis Bacteria in Iowa State Water Sources Using Ceramic Filters**
Presenters: *Karen Devora, Bryce Trpkosh, Hannah Jeffrey, Samuel Sonius*, Civil Engineering
Mentors: Kaoru Ikuma, Chris Rehmann, Civil, Construction, and Environmental Engineering
- P.32 **Phage Discovery Lab**
Presenters: *Jared Maas, Austin Becker, Martin Leyhe, Chenxi Li*, Microbiology
Mentors: Nick Peters, Nancy Boury, Plant Pathology and Microbiology
- P.33 **The Effect of Deicers on Water Quality of Streams in Urban Areas**
Presenters: *Nicole Martindale, Jackson Manthey, John Feldmann*, Civil Engineering
Mentors: Kaoru Ikuma, Chris Rehmann, Civil, Construction, and Environmental Engineering
- P.34 **Annotation of Two Podoviridae Phage that Infect Microbacterium Foliorum**
Presenters: *Karin Resendiz-Medina, Alex Beers, Seth Taylor, Faith Seggerman*, Microbiology
Mentors: Nick Peters, Nancy Boury, Plant Pathology and Microbiology
- P.35 **Tracking Of Prominin 1 Gene During Zebrafish Development To Reveal Stem Cell Fate**
Presenters: *Maci Slaybaugh, Jessica Ivey, Julian Chrobak-Prince*, Genetics
Mentors: Jeff Essner, Allison Birnbaum, Genetics, Development, and Cell Biology
- P. 36 **Effectiveness of Rubber Chips in Treating Stormwater**
Presenters: *Nicholas Streit, Josiah Crawford, Ote Albrecht*, Civil Engineering, *Jake Kraemer*, Geology
Mentors: Kaoru Ikuma, Chris Rehmann, Civil, Construction, and Environmental Engineering

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