Iowa State University

11th SYMPOSIUM ON UNDERGRADUATE RESEARCH & CREATIVE EXPRESSION

April 11, 2017

http://www.undergradresearch.iastate.edu/symposium/
**Program Overview**

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

8:30 – 9:30  **OPENING**, Memorial Union, Gallery Room

*Welcome: Svitlana Zbarska*, Undergraduate Research Program Coordinator, Campus-Wide, Iowa State University

*Opening remarks: Derrick Rollins*, Professor, Department of Chemical and Biological Engineering, Department of Statistics, Iowa State University

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

I.A – Chemistry and Biochemistry  
Memorial Union, Room 3219

I.B – Civil Engineering  
Memorial Union, Room 3505

I.C – Genetics and Cell Biology I  
Memorial Union, Room 3512

I.D – Architecture and Community/Regional Planning  
Memorial Union, Room 3534

I.E – Human Development and Family Studies I  
Memorial Union, Room 3538

I.F – Microbiology  
Memorial Union, Room 3558

I.G – Students and Campus Resources  
Memorial Union, Gallery Room

I.H – Mechanical Engineering I  
Memorial Union, Oak Room

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

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

II.A – Kinesiology and Health  
Memorial Union, Room 3505

II.B – Chemical Engineering  
Memorial Union, Room 3512

II.C – Entomology I  
Memorial Union, Room 3534

II.D – Linguistics and Spanish  
Memorial Union, Room 3538

II.E – Agricultural and Biosystems Engineering  
Memorial Union, Room 3558

II.F – Environmental Science  
Memorial Union, Gallery Room

II.G – Agronomy I  
Memorial Union, Oak Room
12:00 – 1:00  Lunch, Memorial Union, Sun Room

Key speaker presentation: Brent Shanks, Professor, Department of Chemical and Biological Engineering, Director, NSF Engineering Research Center for Biorenewable Chemicals (CBiRC)

“The Power of Interdisciplinary Research: The Case of the Center for Biorenewable Chemicals”

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

III.A – Political Science
Memorial Union, Room 3219

III.B – Sociology
Memorial Union, Room 3505

III.C – Education and Technology
Memorial Union, Room 3512

III.D – Industrial Engineering
Memorial Union, Room 3534

III.E – Entomology II
Memorial Union, Room 3538

III.F – Leadership and Gender Studies
Memorial Union, Room 3558

III.G – Aerospace Engineering
Memorial Union, Gallery Room

III.H – Human Development and Family Studies II
Memorial Union, Oak Room

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

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

IV.A – Animal Studies
Memorial Union, Room 3219

IV.B – Computer Engineering
Memorial Union, Room 3505

IV.C – Genetics and Cell Biology II
Memorial Union, Room 3512

IV.D – Materials Science and Engineering
Memorial Union, Room 3534

IV.E – Industrial Design
Memorial Union, Room 3538

IV.F – Agronomy II
Memorial Union, Room 3558

IV.G – Mechanical Engineering II
Memorial Union, Gallery Room

IV.H – Psychology
Memorial Union, Oak Room

3:00 – 5:00  POSTER SESSION, Memorial Union, South Ballroom

5:30 – 6:30  AWARD CEREMONY, 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 11th 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 quests through oral and poster presentations. Near 170 students from all Iowa State University colleges will present about 140 research projects. More than 50 Iowa State faculty members will participate as facilitators or judges to provide feedback to presenters and identify the best presentations. 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, Graduate College and Veterinary Medicine.

We hope you enjoy the day!

Svitlana Zbarska
Symposium Coordinator
Undergraduate Research program coordinator

Susan Yager
Faculty Director of the Honors program

Laurie Smith Law
Administrative Director of the Honors program
SESSION I, 9:30-10:45 am

CHEMISTRY AND BIOCHEMISTRY

Faculty Moderator: Adam Rossini, Chemistry

I.A.1 Effects of Aqueous-Organic Solvent Systems on Crystals and the Structure of the DNA Polymerase from the apicoplast of Plasmodium falciparum
Wesley Metcalfe, Chemical Engineering
Mentor: Richard Honzatko, Biochemistry/Biophysics

I.A.2 Optimization of the enzymatic pathway for UDP-xylose biosynthesis
Matthew Cook, Biochemistry and Genetics
Mentor: Olga Zabotina, Biochemistry, Biophysics, and Molecular Biology

I.A.3 Cobalt-catalyzed hydroacylation of N-Vinylindole
Kristina Nugent, Chemistry
Mentor: Levi Stanley, Chemistry

CIVIL ENGINEERING

Faculty Moderator: Simon Laflamme, Civil, Construction, and Environmental Engineering

I.B.1 Water Quality Study for Microcystin Detection using Colorimetric Gold Nanoparticles
Devesh Mohan, Electrical Engineering
Mentor: Meng Lu, Electrical and Computer Engineering

I.B.2 Assessment of Simple Test to Evaluate Concrete Permeability
Erica Mack, Civil Engineering
Mentor: Peter Taylor, Civil, Construction, and Environmental Engineering

I.B.3 Impact of Wastewater Effluent on Antibiotic Resistant Phenotypes
Kevin Prince, Civil Engineering - Environmental Specialization
Mentor: Kaoru Ikuma, Civil, Construction, and Environmental Engineering

I.B.4 High Voltage Atmospheric Cold Plasma Treatment of Wastewater
Jens Dancer, Civil Engineering
Mentors: Martin Gross, Center for Crops Utilization Research, and Kevin Keener, Food Science & Human Nutrition

GENETICS AND CELL BIOLOGY I

Faculty Moderator: Jeffrey Trimarchi, Genetics, Developmental, and Cell Biology

I.C.1 Growing maize on Mars: Effects of Irradiation Induced Transposable Element Activity on Plant Survival and Development
Raegan Hoefler, Genetics
Mentor: Thomas Peterson, Genetics, Developmental, and Cell Biology

I.C.2 oca2 Mutation and its Effects on Pigmentation and Behavior in Astyanax Mexicanus and Danio Rerio
Hannah Klaassen, Nutritional Science
Mentor: Johanna Kowalko, Department of Genetics, Development and Cell Biology
I.C.3  Investigating retinal development through loss of function analysis  
*Abbie Burney*, Biology  
Mentor: Jeffrey Trimarchi, Department of Genetics, Development and Cell Biology

I.C.4  Characterization of the LITAF-like gene family in Anopheles gambiae and its possible role in mosquito anti-malarial immunity  
*Andrew Guinness*, Biology  
Mentor: Ryan Smith, Entomology

**ARCHITECTURE AND COMMUNITY/REGIONAL PLANNING**

Session I.D  
9:30-10:45  
Room 3534  
Faculty Moderator: Jelena Bogdanovic, Architecture

I.D.1  Interlock House - Occupant Feedback Strategies for Achieving Net Zero Energy  
*Kaylinn Taggart*, Architecture and Community/Regional Planning  
Mentor: Ulrike Passe, Architecture

I.D.2  Mobile Diagnostic Lab (MDL) - Research Environment for Enhancing Energy Efficiency in Building Science  
Mentor: Ulrike Passe, Architecture

I.D.3  Feminist and Green Design: new aesthetics or new ethics?  
*Tripti Upreti*, Architecture  
Mentor: Andrea Wheeler, Architecture

**HUMAN DEVELOPMENT AND FAMILY STUDIES I**

Session I.E  
9:30-10:45  
Room 3538  
Faculty Moderator: Thomas Schofield, Human Development & Family Studies

I.E.1  Racial Disparities in Domestic Violence Offenders Treatment  
*Brittany Pernell*, Child, Adult, and Family Services  
Mentor: Amie Zarling, Human Development and Family Studies

I.E.2  Housing Programs: The Impact on the Quality of Life of People in Poverty  
*Margaret Standish*, Chemistry  
Mentor: Amber Manning-Ouellette, Leadership Studies

I.E.3  Communication Privacy Management Theory: How parents talk about their children who have a chronic illness  
Mentor: Katherine Rafferty, Communication Studies/Psychology

**MICROBIOLOGY**

Session I.F  
9:30-10:45  
Room 3558  
Faculty Moderator: Aubrey Mendonca, Food Science & Human Nutrition

I.F.1  Evaluation of Escherichia coli outer membrane protein EtsC as a candidate antigen for vaccine against Avian Pathogenic E. coli infections in chickens  
*David Couri*, Microbiology  
Mentor: Melha Mellata, Department of Food Science and Human Nutrition

I.F.2  Evaluate broad protection of the Escherichia coli Outer membrane protein (Omp) A against Avian Pathogenic E. coli infections in chickens  
*Caroline Treadwell*, Biology & Animal Science  
Mentor: Melha Mellata, Food Science and Human Nutrition
Session I.G
9:30-10:45
Gallery room

STUDENTS AND CAMPUS RESOURCES

Faculty Moderator: Amber Manning-Ouellette, Leadership Studies

I.G.1
“New” News: The State of News Consumption and Helping Inform College Students
Keaton Mohr, Public Relations
Mentor: Amber Manning-Ouellette, Leadership Studies

I.G.2
The Rise of Mental Health and the Effectiveness of Resources Available on College Campuses
Annika Mikkelson, Event Management
Mentor: Amber Manning-Ouellette, Leadership Studies

I.G.3
Capable and Smart Decisions about Student Loans
Amberly Ehret, Child, Adult, and Family Services
Mentor: Clinton Gudmunson, Human Development and Family Studies

Session I.H
9:30-10:45
Oak room

MECHANICAL ENGINEERING I

Faculty Moderator: Gregory Maxwell, Mechanical Engineering

I.H.1
A Methodology for Imaging Soybean Leaf Trichome Characteristics
Jocelyn Jackson, Mechanical Engineering
Mentor: Sriram Sundararajan, Mechanical Engineering

I.H.2
Producing High-Contrast Images of Speckled Brain Tissue for Non-Contact Optical Measurements
Sarah Hansen, Mechanical Engineering
Mentor: Sarah Bentil, Mechanical Engineering

I.H.3
Characterizing Soft Materials Using an Indentation Device
Garth Benson, Mechanical Engineering
Mentor: Sarah Bentil, Mechanical Engineering

SESSION II, 11:00 am – 12:00 pm

Session II.A
11:00-12:00
Room 3505

KINESIOLOGY AND HEALTH

Faculty Moderator: Elizabeth Stegemoller, Kinesiology and Health

II.A.1
Relationship between Physical Activity and Quality of Life in Persons with Parkinson's Disease
Alyssa Sunken, Kinesiology, Erin Gibson, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology and Health

II.A.2
The Influence of Activating and Relaxing Music on Velocity and Acceleration of Repetitive Finger Movements
Brandon Bates, Kinesiology and Health, David Ratigan, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology and Health

II.A.3
The effects of large scale writing on micrographia as a symptom of Parkinson's Disease
Anna Hoiberg, Kinesiology
Mentor: Ann Smiley-Oyen, Kinesiology and Health
Session II.B  
11:00-12:00  
Room 3512

**CHEMICAL AND BIOLOGICAL ENGINEERING**

Faculty Moderator: Laura Jarboe, Chemical and Biological Engineering

**II.B.1** Effect of Cellulosic Hydrolysate Compounds and Biofuels in Escherichia coli  
*Patrick Hertzel*, Chemical Engineering  
Mentor: Miguel Chavez, Chemical Engineering

**II.B.2** The Effect of Stiffness on Cancer Cell Contact Guidance  
*Joseph Koelbl*, Chemical Engineering  
Mentor: Ian Schneider, Chemical and Biological Engineering

**II.B.3** Low-Cost Optics for Field-Based Optical Biosensors  
*Viktoriia Kriuchkovskaja*, Chemical Engineering and Mathematics  
Mentor: Nigel Reuel, Chemical and Biological Engineering

Session II.C  
11:00-12:00  
Room 3534

**ENTOMOLOGY I**

Faculty Moderator: Joel Coats, Entomology

**II.C.1** Do paper wasps have personalities? Physiological and genomic mechanisms of personality in Polistes fuscatus  
*Colby Behrens*, Biology & Animal Ecology  
Mentor: Amy Toth, Ecology, Evolution, and Organismal Biology

**II.C.2** Native paper wasps hold potential as bio-control agents for lepidopteran pests of Brassica  
*Erin McCall*, Biology  
Mentor: Amy Toth, Ecology, Evolution, and Organismal Biology

**II.C.3** Assessing the Ability of Various Plant Essential Oils and Sesquiterpenoids to Repel Bed Bugs  
*Kylie Crystal*, Animal Ecology  
Mentor: Joel Coats, Entomology

Session II.D  
11:00-12:00  
Room 3538

**LINGUISTICS AND SPANISH**

Faculty Moderator: Rachel Ferreira, World Languages and Cultures

**II.D.1** Feedback from Latin American immigrant families and children on a children's book aimed to help Latin American children manage acculturative stress  
*Kevin Wagner*, Psychology, Spanish  
Mentor: Carolyn Cutrona, Psychology

**II.D.2** Organization of vocabulary in L2 Spanish textbooks: Semantic relationships within and between vocabulary lists  
*Brody Dingel*, Spanish, Linguistics  
Mentor: Evgeny Chukharev-Khudilaynen, English

**II.D.3** L1 Spanish speakers perception of English vowels produced by both L1 and L2 English speakers  
*Richard Ambert Torres*, Spanish  
Mentor: Charles Nagle, World Languages and Cultures

**II.D.4** First Contact with Latin American Science Fiction and Fantasy  
*Sarah Allen*, Spanish and Nutritional Science  
Mentor: Rachel Haywood Ferreira, World Languages and Cultures
**Session II.E**  
11:00-12:00  
Room 3558

**AGRICULTURAL AND BIOSYSTEMS ENGINEERING**

Faculty Moderator: U. Sunday Tim, Agricultural and Biosystems Engineering

**II.E.1**  
New Algae Treatment Technology Addresses Stricter Wastewater Regulations for Rural Iowa  
*Max Gangestad, Agricultural Engineering*  
Mentors: Martin Gross, Food Science & Human Nutrition, and Kevin Keener, Food Science & Human Nutrition

**II.E.2**  
Low Cost Method of Determining Grain Moisture for Small Holder Farmers  
*Noelle Hinrichs, Agricultural Systems Technology*  
Mentor: Thomas Brumm, Agricultural & Biosystems Engineering

**Session II.F**  
11:00-12:00  
Gallery room

**ENVIRONMENTAL SCIENCE**

Faculty Moderator: Ulrike Passe, Architecture

**II.F.1**  
Cup plant biases community nitrogen composition in response to increasing prairie community diversity  
*Jacob Hill, Environmental Science; Biology*  
Mentor: Lisa Schulte Moore, Natural Resource Ecology and Management

**II.F.2**  
Patterns of Woody Encroachment Establishment in Restored Prairies  
*Andrea Colton, Biology*  
Mentor: Halre Rogers, Ecology, Evolution, and Organismal Biology

**II.F.3**  
Reconstructing past environmental conditions in the Arctic using shell growth records from Svalbard, Norway  
*Aubrey Fouk, ENSCI and BIOL*  
Mentor: Alan Wanamaker, Geologic and Atmospheric Sciences

**II.F.4**  
Topographic Geospatial Assessment of Subsurface Drainage Tile Locations  
*David Ortiz, Environmental Science*  
Mentor: William Crumpton, Ecology, Evolution, and Organismal Biology

**Session II.G**  
11:00-12:00  
Oak room

**AGRONOMY I**

Faculty Moderator: Tyler Jensen, Finance

**II.G.1**  
Hydroponic Testing of Iron Deficiency Chlorosis in Soybeans  
*Sarah Kurtz, Biology and Horticulture*  
Mentor: Silvia Cianzio, Agronomy

**II.G.2**  
Review of Fruit-Frugivore Interactions  
*Alexander Karnish, Biology*  
Mentor: Halre Rogers, Ecology, Evolution, and Organismal Biology

**II.G.3**  
Soybean Yield Response to Nitrogen Applied at Different Growth Stages  
*Jonathon Boss, Agronomy*  
Mentor: S. Carolina Cordova, Agronomy

**II.G.4**  
Efficacy and Cost Evaluation Using R1-nj Phenotype to Select Haploid Sweet Corn  
*Rebekah Arnold, Agronomy/Seed Science*  
Mentor: Jianming Yu, Agronomy
## SESSION III, 1:15 pm – 2:15 pm

### POLITICAL SCIENCE

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
<th>Mentor(s)</th>
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<tbody>
<tr>
<td></td>
<td>Social Media’s Role in Facilitating Political Revolution</td>
<td>David Weinstein, Software Engineering</td>
<td>Amber Manning-Ouellette, Leadership Studies</td>
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### SOCIOLOGY

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<tr>
<td>1:15-2:15</td>
<td>A Historical Look at the Public Perceptions of Law Enforcement</td>
<td>Alissa Mathisen, Public Relations</td>
<td>Amber Manning-Ouellette, Leadership Studies</td>
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<td>Beyond Violence and Villains: How Local Television News Frames Key Sources in Crime Narratives</td>
<td>Susan Cruz-Rodriguez, Public Relations</td>
<td>Jan Lauren Boyles, Greenlee School of Journalism and Mass Communication</td>
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<td>Does Rapport Increase Compliance During Investigative Interviews?</td>
<td>Berenice Real, Psychology</td>
<td>Max Guyll, Psychology Department</td>
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<td>Increased Suicide Rates in Iowa</td>
<td>Liera Bender, Psychology</td>
<td>Amber Manning-Ouellette, Leadership Studies</td>
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### EDUCATION AND TECHNOLOGY

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<th>Mentor(s)</th>
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<tr>
<td>1:15-2:15</td>
<td>Uses and Gratifications, Attitudes, and Willingness to Learn Computer Mediated Communication</td>
<td>Emily Petty, Communication Studies</td>
<td>Kelly Odenweller, Psychology</td>
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<td>Engineers of Tomorrow</td>
<td>Jilliane Brinkman, Industrial Engineering, Will Wandro, Industrial Engineering</td>
<td>Prashant Rajan, English</td>
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<td>Biology Education through Video Games: How Meta!Blast Works</td>
<td>Jack Potter, Computer Engineering</td>
<td>Eve Wurtele, Biology</td>
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<td>Shaping Watersheds Through Augmented Reality</td>
<td>Emma Gallegos, Industrial Technology</td>
<td>U. Sunday Tim, Agricultural and Biosystems Engineering</td>
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Session III.D 1:15-2:15 Room 3534

INDUSTRIAL ENGINEERING
Faculty Moderator: Sarah Ryan, Industrial and Manufacturing Systems Engineering

III.D.1 Factboard: Real-Time Data Driven Visual Decision Support System for the factory floor
Enrique Alameda, Industrial Engineering
Mentor: Sarah Ryan, Industrial & Manufacturing Systems Engineering

III.D.2 Optimization of a mixed-model assembly sequencing
Enrique Alameda Basora, Industrial Engineering
Mentor: Sarah Ryan, Industrial & Manufacturing Systems Engineering

III.D.3 An Agricultural Harvest Knowledge Survey to Distinguish Types of Expertise
Chase Grimm, Industrial Engineering
Mentor: Stephen Gilbert, Industrial Engineering and Human Computer Interaction

Session III.E 1:15-2:15 Room 3538

ENTOMOLOGY II
Faculty Moderator: Gregory Courtney, Entomology

III.E.1 Distribution of Topical Butterflies in Disturbed Island Habitats of Bocas del Toro, Panamá
Logan Crees, Environmental Science
Mentor: Leonor Ceballos, School for Field Studies (Tropical Island Biodiversity Studies)

III.E.2 Does Marking With DayGlo ECO Aurora Pink Pigment Powder Affect the Development or Survival of Monarch Caterpillars?
Nancy Shryock, Animal Ecology
Mentor: Diane Debinski, Ecology, Evolution, and Organismal Biology

III.E.3 Exploring natural approaches to enhance control of Zika mosquito populations
Maria Archevald-Cansobre, Biology
Mentor: Joel Coats, Entomology

Session III.F 1:15-2:15 Room 3558

LEADERSHIP AND GENDER STUDIES
Faculty Moderator: Amber Manning-Ouellette

III.F.1 Leadership Confidence and Multiple Minority Stress Among Queer Women of Color: The Moderators of Grit and Social Support
Icel Davila, Psychology
Mentor: Meifen Wei, Psychology

III.F.2 Early education and gender equality
Elizabeth Amado, Aerospace Engineering and Leadership Studies
Mentor: Amber Manning-Ouellette, Leadership Studies

III.F.3 The Inclusive Engineering Environment: Exploring Company Practice using Various Leadership Approaches
Katlyn Malone, Computer Engineering
Mentor: Amber Manning-Ouellette, Leadership Studies

III.F.4 Factors Preventing Male, African-American, High School Students from Attending Four Year Universities
Chandler Wilkins, Community & Regional Planning
Mentor: Francis Owusu, Community & Regional Planning
### Session III.G
1:15-2:15
Gallery room

**AEROSPACE ENGINEERING**

**Faculty Moderator:** Leonard Bond, Aerospace Engineering

**III.G.1**
**Unmanned Aircraft System-Based Structural Health Monitoring**

*Sam Dwyer*, Aerospace, *Charles Vavrick*, Aerospace Engineering  
Mentor: Christina Bloebaum, Aerospace Engineering

**III.G.2**
**A Couplings Approach to Mitigate Unexpected Behaviors in Large Scale Complex Engineering Systems Specifically for the Ares 1 Rocket**

*Benjamin Giles*, Aerospace Engineering  
Mentor: Christina Bloebaum, Aerospace Engineering

**III.G.3**
**Using X-ray Micro-CT Scanning to Characterize Cracking in Composites**

*Rachel Roth*, Aerospace Engineering  
Mentor: Scott Wendt, Environmental Health & Safety

**III.G.4**
**Analysis of Metallic Structure with Ultrasonic Nondestructive Evaluation**

Mentor: Peter Collins, Materials Science and Engineering

### Session III.H
1:15-2:15
Oak room

**HUMAN DEVELOPMENT AND FAMILY STUDIES II**

**Faculty Moderator:** Megan Gilligan, Human Development & Family Studies

**III.H.1**
**Iowa QRS: Understanding what Families Know of Child Care Quality Indicators Initiatives**

*Jennifer Barry-Young*, Human Development & Family Studies  
Mentor: Amber Manning-Oulette, Leadership Studies

**III.H.2**
**Music and its Importance in the Development of Children**

*Harrison Guetzko*, Business Management  
Mentor: Amber Manning-Oulette, Leadership Studies

**III.H.3**
**Paternity Leave: Fathers' Impact on Families**

*Ashley Roth*, Public Relations  
Mentor: Amber Manning-Oulette, Leadership Studies

### SESSION IV, 2:30 pm – 3:30 pm

**ANIMAL STUDIES**

**Faculty Moderator:** Grant Dewell, VDPAM

**IV.A.1**
**Comparison of Outcome Following Semitendinosus Tenotomy Performed under Standing Sedation versus General Anesthesia for the Treatment of Fibrotic Myopathy in Horses**

*Ashley Hays*, Animal Ecology  
Mentor: David Suarez-Fuentes, Veterinary Clinical Sciences

**IV.A.2**
**Efficiency of pulsed gastric lavage for evaluating fingerling Walleye Sander vitreus diets**

*Trevor Blankman*, Animal Ecology  
Mentor: Michael Weber, Natural Resource Ecology and Management
IV.A.3 Pit Bulls Today  
_Hannah Nation_, Event Management  
Mentor: Amber Manning-Ouellette, Leadership Studies

### COMPUTER ENGINEERING

Session IV.B  
2:30-3:30  
Room 3505

Faculty Moderator: Nathan Neihart, Electrical and Computer Engineering  

IV.B.1 Machine Learning approaches for tassel identification  
_Joe Van Treeck_, Computer Engineering  
Mentor: Baskar Ganapathysubramanian, Mechanical Engineering

IV.B.2 Automated Recognition of Corn Embryos for Selective Breeding  
_Tanner Holte_, Computer Engineering  
Mentor: Baskar Ganapathysubramanian, Mechanical Engineering

IV.B.3 Fast Algorithms for Recommender Systems  
_Souparni Agnihotri_, Computer Engineering, _Omar Taylor_, Computer Engineering  
Mentor: Chinmay Hegde, Electrical and Computer Engineering

IV.B.4 Software to simulate genomic selection  
_Takao Shibamoto_, Computer Engineering  
Mentor: Lizhi Wang, Industrial and Manufacturing Systems Engineering

### GENETICS AND CELL BIOLOGY II

Session IV.C  
2:30-3:30  
Room 3512

Faculty Moderator: N. Matthew Ellinwood, Animal Science  

IV.C.1 Analysis of ALS-associated genes in the zebrafish Danio rerio.  
_Courtney Smith_, Genetics  
Mentor: Jeffrey Trimarchi, Genetics, Development and Cell Biology

IV.C.2 Assessing the role of the ALS-associated gene NEK1 in zebrafish motor neuron development.  
_Amy Stark_, Genetics  
Mentor: Jeffrey Trimarchi, Genetics, Development and Cell Biology

IV.C.3 Uncovering genetic factors that mark subtypes of retinal ganglion cells  
_Gabriel Maldonado_, Biology  
Mentor: Jeffrey Trimarchi, Genetics, Development and Cell Biology

IV.C.4 Biocompatible Polymer Microfibers Promote Adult Neural Stem Cell Proliferation and Differentiation  
_Dan Stroud_, Genetics  
Mentor: Donald Sakaguchi, Genetics, Development and Cell Biology

### MATERIALS SCIENCE AND ENGINEERING

Session IV.D  
2:30-3:30  
Room 3534

Faculty Moderator: Michael Bartlett, Materials Science and Engineering  

IV.D.1 Structural Investigation of Oxy-thio Phosphate glasses and their Physical Properties  
_Adriana Joyce_, Materials Science and Engineering  
Mentor: Steven Kmiec, Materials Science and Engineering

IV.D.2 Effect of Smoothening Electrodes for Revealing Finer Molecular Information in Charge Transport
Atte Kadoma, Materials Engineering
Mentor: Martin Thuo, Materials Engineering

IV.D.3  Reconstruction of full elements of Nye tensor by coupling precession electron diffraction (PED) measurements with computation method in simulated Nano-scaled crystal sample
Haidong Liu, Materials Engineering
Mentor: Peter Collins, Materials Science and Engineering

IV.D.4  Investigations of Titanium - Alkaline Earth Composite Materials
Lindsay Winters, Materials Engineering and Spanish
Mentor: Peter Collins, Materials Science and Engineering

INDUSTRIAL DESIGN

Session IV.E 2:30-3:30 Room 3538

Faculty Moderator: Tejas Dhadphale

IV.E.1  Deconstructing Values of the Everyday Object
Anna Olinger, Industrial Design
Mentor: Tejas Dhadphale, Industrial Design

IV.E.2  Changing the Perceptions of Making: Adjusting the Mechanics of Ideation for Multidisciplinary Success
Kellie Walters, Industrial Design
Mentor: Betsy Barnhart, Industrial Design

IV.E.3  Addressing Gender Inequality and Inequity in Industrial Design
Kellie Walters, Industrial Design
Mentor: Betsy Barnhart, Industrial Design

IV.E.4  Investigating Ideation Flexibility through Incremental to Radical Design Heuristics
Ian Baker, Industrial Design
Mentor: Seda McKilligan, Industrial Design

AGRONOMY II

Session IV.F 2:30-3:30 Room 3558

Faculty Moderator: Silvia R. Cianzio, Agronomy

IV.F.1  Soil Respiration Rates and Carbon Isotope Emissions under Differing Herbivory and Plant Diversity Treatments in a Restoration Prairie
Miranda Salsbery, Biology
Mentor: Haldre Rogers, Ecology, Evolution & Organismal Biology

IV.F.2  Improving Soil Conservation and Crop Performance through Reduced Tillage and Cover-Crop-Based Rotations in Organic Squash Production
Rebecca Johnson, Agronomy
Mentor: Kathleen Delate, Agronomy and Horticulture

IV.F.3  Crop rotation diversity to improve water quality and increase soil health
Jordan Kersey, Environmental Science and Biology
Mentor: Mike Castellano, Agronomy

MECHANICAL ENGINEERING
Session IV.G  
2:30-3:30  
Gallery room  
Faculty Moderator: Reza Montazami, Mechanical Engineering

IV.G.1 Investigating the kinetics of protein-ligand complexes using electrochemical techniques  
*Marcos Cortes*, Mechanical Engineering  
Mentor: Pranav Shrotriya, Mechanical Engineering

*Michael Byler*, Mechanical Engineering  
Mentor: Nicola Bowler, Material Science Engineering

IV.G.3 Effects of Confinement Geometry on Diblock Copolymer Systems Using Finite Element Analysis  
*Jonathan Green*, Mechanical Engineering  
Mentor: Baskar Ganapathysubramanian, Mechanical Engineering

Session IV.H  
2:30-3:30  
Oak room  
Faculty Moderator: Thomas Schofield, Human Development

IV.H.1 Forgiving in the Moment  
*Emily Waskel*, Psychology  
Mentor: Doug Gentile, Psychology

IV.H.2 Higher-Level Health Habits: My Plate Guidelines  
*Madeline Johnson*, Psychology  
Mentor: Leigh Alison Phillips, Psychology

POSTER SESSION, 3:00 pm – 5:00 pm

Poster Session  
3:00-5:00  
Sun Room

P.1 Preventing Software Piracy in a Global World  
*Danielle Mettenbrink*, Aerospace  
Mentor: Amber Manning-Ouellette, Leadership Studies

P.2 Twin Sectors caused by Alternative Transpositions in Maize  
*Jeremy Schuster*, Agricultural Genetics  
Mentor: Thomas Peterson, Genetics, Development and Cell Biology

P.3 Social Network Analysis of Agricultural Advocacy Organizations and Advocacy Communication  
*Jordon Oellerich*, Agriculture and Life Sciences Education-Communications Option  
Mentor: Kathleen Hunt, Agriculture and Life Sciences Education-Communications

P.4 Midwest Soybean Farmers’ Perceptions and Management of Glyphosate Weed Resistance  
*Emily Southard*, Agriculture & Society and Global Resource Systems  
Mentor: Carmen Bain, Sociology
P.5 Academic Publication Productivity in HDFS Faculty

Kimberly Carpenter, Animal Science
Mentor: Cassandra Dorius, Human Development & Family Studies

P.6 The Jade Emperor: Identifying a Chinese Ceramic Sculpture

Mackenzie Knight, Art Design Visual Culture double major with Religious Studies
Mentor: John Cunnally, Art and Visual Culture

P.7 Trophozoite killing assays for Tritrichomonas foetus parasites

Kaitlyn Murphy, Biology, Jessica Meseck, Animal Science
Mentor: Matthew Brewer, Veterinary Pathology

P.8 Effects of Glucose on Cortisol and Implicit Cognition

Logan Stiens, Biology
Mentor: Elizabeth Shurtleff, Human Development & Family Studies

P.9 Effects of Nitrogen Addition Timing and Herbivory on Plant Diversity

Jordann Bickley, Biology and Animal Ecology
Mentor: Lori Biederman, Ecology, Evolution, and Organismal Biology

P.10 Synthesis and Application of Janus Particles

Devin Palm, Chemical Engineering, Connor Hammons, Materials Engineering, Dana Smith, Materials Engineering
Mentor: Shan Jiang, Materials Science and Engineering

P.11 Swelling and degradation of alginate hydrogels with and without skim milk

Bishop Archer, Chemical Engineering
Mentor: Rebecca Cademartiri, Materials Science and Engineering

P.12 Wireless electrode (BPE) apply in dielectrophoresis

Zihan Yang, Chemistry
Mentor: Robbyn Anand, Chemistry

P.13 The Intergenerational Continuity of Warm Couple Interactions

Mary Kirk, Child, Adult, and Family Services
Mentor: Tricia Neppl, Human Development and Family Studies

P.14 Parenting: It’s A Life’s Curriculum Supported by FCS Standards

Courtney Mull, Elementary Education
Mentor: Kathryn Goudy-Haht, Human Development and Family Studies

P.15 Moth Diversity of the Grand River Grasslands of South-central Iowa

Logan Cree, Environmental Science
Mentor: Diane Debinski, Ecology, Evolution, and Organismal Biology

P.16 The House Price Impacts of Corporate Headquarter Relocations

Peter Myers, Finance
Mentor: Tracy Turner, Finance

P.17 Mapping vegetation phenology from satellite remote sensing

Canaan Mills, Geology and International Studies
Mentor: Yuyu Zhou, Geological and Atmospheric sciences
P.18 Simulation Modeling of Human Behavior in Production Systems & Team Dynamics
Josiah Green, Industrial Engineering
Mentor: Caroline Krejci, Industrial and Manufacturing Systems Engineering

P.19 Engineering Challenges Faced by Elementary Education Majors
Dagney Paskach, Industrial Engineering, Grace Wilkins, Electrical Engineering, Logan Angstead, Construction Engineering, Hubert Ooi, Mechanical Engineering, Kelvin Miskowiec, Chemical Engineering
Mentor: Benjamin Ahn, Aerospace Engineering

P.20 Engineering Education for Rural Schools
Danny Savage, Industrial Engineering, Adam Podhajsky, IE, Erik Danford-Klein, IE
Mentor: Prashant Rajan, English

P.21 Repetitive finger movement in Parkinson's patients
Lindsay Ebeling, Kinesiology, Amos Kotz, Kinesiology, Abby Crimmins, Linguistics
Mentor: Elizabeth Stegemoller, Kinesiology

P.22 The Effects of Acoustic Environment on the Gait in Parkinson's Disease
Stephanie Masek, Kinesiology, Andrew Deiter, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology

P.23 The Influence of Activating Versus Relaxing Music on Repetitive Finger Movement and Associated Cortical Activity
Emilio Zayas, Kinesiology, Rebecca Lair, Biology, Lauren Young, Psychology, Zoe Lambert, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology

P.24 The Influence of Parkinson's Disease Symptoms on Repetitive Toe Tapping at High and Low Frequencies
Alexandra Jeppesen, Kinesiology and Health Pre-Physical Therapy, Callan Barrick, Kinesiology, Alexa Badding, Kinesiology, Thomas Berta, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology

P.25 The effects of large scale writing on micrographia as a symptom of Parkinson's Disease
Anna Hoiberg, Kinesiology
Mentor: Ann Smiley-Oyen, Kinesiology

P.26 Increased Sensorimotor Brain Activity During Movement Sequencing in Young Adults with Developmental Dyslexia
Emma VanSickle, Kinesiology & Health, Elizabeth Petran, Kinesiology & Health
Mentor: Ann Smiley-Oyen, Kinesiology

P.27 Consumer Perceptions of Diverse Food Preferences: A Card-Sorting Exercise
Bailey Wood, Marketing
Mentor: Samantha Cross, Marketing

P.28 Exploring Wearable Technology: Solar Powered Book Bags
Courtney Beringer, Mechanical Engineering, Sam Vande Loo, Mechanical Engineering
Mentor: Eulanda Sanders, Apparel, Events & Hospitality Management

P.29 Autonomous Battery Station: An all-in-one station that charges and switches out batteries for agricultural drones and ground robots autonomously
Shivkarthi Sundar, Mechanical Engineering, Jensen Mayes, Electrical Engineering, Kyle Helvie, Mechanical Engineering, Riley Roche, Mechanical Engineering, Brian Welch, Mechanical Engineering
Mentor: Sourabh Bhattacharya, Mechanical Engineering
Programming a Robotic Arm
Matt Pauk, Computer Science, Isaac Stahr, Computer Engineering, Max Garton, Computer Engineering, Erin Kamm, Computer Science
Mentor: Sourabh Bhattacharya, Mechanical Engineering

Whole Egg Consumption Attenuates Weight Gain in Obese Type 2 Diabetic Rats
Kaylee Hahn, Nutritional Science, Caitlyn Coonts, Dietetics, Carter Reed, Kinesiology and Health
Mentor: Kevin Schalinske, Food Science & Human Nutrition

Living in the Moment: The Effect of Mindfulness on Aggression and Well-Being
Manuela Faulhaber, Psychology and Sociology, Kelly McKnight, Psychology & Criminal Justice, Miranda Frederick, Psychology, Anja Amundson, Biology
Mentor: Doug Gentile, Psychology

Abstracts for the presentations at this year’s Symposium are available on the ISU website:
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