5th ANNUAL
SYMPOSIUM ON
UNDERGRADUATE RESEARCH
& CREATIVE EXPRESSION

SCHEDULE OVERVIEW

8:30 - 9:00  Registration and Refreshments, Pioneer Room
9:00 - 9:30  Opening

9:30 – 10:45  PRESENTATION SESSION I

SESSION I.A  COMPUTER ENGINEERING & CIVIL ENGINEERING
Memorial Union, Room 3505
Moderator: Reginald Souleyrette, Civil, Construction & Environmental Engineering

I.A.1  Interactive Object Recognition Using Proprioceptive and Auditory Feedback
Connor Schenck, Computer Science, College of Liberal Arts & Sciences (Mentor: Alexander Stoytchev)

I.A.2  3D Imaging with Infrared Light
Morgan Hoke, Computer Engineering, College of Engineering (Mentor: Song Zhang)

I.A.3  Exploring Ultra-High Performance Concrete in Bridge Foundations
William Cord, Civil Engineering, College of Engineering (Mentor: Sri Sritharan)

I.A.4  An Innovative Wall to Resist Earthquake Loads
Kayla Hultquist, Civil Engineering, College of Engineering (Mentor: Sri Sritharan)

SESSION I.B  FASHION, IMAGE & HOME ECONOMICS
Memorial Union, Room 3512
Moderator: Sara Marcketti, Apparel, Educational Studies & Hospitality Management

I.B.1  Curation of a Museum Exhibit: The Work of Designer Scaasi
Colleen Pokorny, Apparel, Merchandising, Design & Production, College of Human Sciences (Mentor: Sara Marcketti)
Natasha Oakley, Apparel, Merchandising, Design & Production, College of Human Sciences
(Mentor: Mary Lynn Damhorst)

I.B.3 A Historical Analysis of Caucasian and Non-Caucasian Female Students Enrolled in the College of Home Economics from 1872 to 1947 at Iowa State University
Jeanie Kirkpatrick, Anthropology and History, College of Liberal Arts & Sciences
(Mentor: Pamela Riney-Kehrberg)

SESSION I.C SOIL SCIENCES
Memorial Union, Room 3534
Moderator: Michael Castellano, Agronomy

I.C.1 Understanding Soil Moisture Using Self-Organizing Maps
Linda Geiger, Agricultural Engineering, Engineering; Adam Halbur, Biological Systems Engineering, College of Agriculture & Life Sciences (Mentor: Amy Kaleita)

I.C.2 Soil Microorganisms Effect on Giant Foxtail Seed Decay
Madeline Tomka, Agronomy, College of Agriculture & Life Sciences
(Mentors: Robin Gómez, and Dr. Matt Liebman)

I.C.3 Determining Soil Cover using Digital Photography and IPAR readings
Andrew Stammer, Agronomy, College of Agriculture & Life Sciences (Mentor: Mary Wiedehoef)

I.C.4 Interactions of Soil Type, Microorganism Community, and Nutrient level
Emily Zimmerman, Biology and Global Resource Systems, College of Liberal Arts & Sciences and College of Agriculture & Life Sciences (Mentor: W. Stan Harpole)

SESSION I.D DESIGN & INTERACTION
Memorial Union, Room 3538
Moderator: Paula Curran, Art & Design

I.D.1 GLIMPSE: of China
Clark Colby, Architecture, College of Design (Mentor: Cameron Campbell)

I.D.2 Typography and Interactive Learning
Kim Manternach, Graphic Design, College of Design (Mentor: Roger Baer)

I.D.3 Trace
Jasmine Singh, Architecture, College of Design; David A. Reid, Architecture, College of Design (Mentor: Peter Goche)

SESSION I.E WATER, WEATHER & THE ENVIRONMENT
Memorial Union, Room 3558
Moderator: Brian Hornbuckle, Agronomy

I.E.1 Wind-Driven Hail Events: Dependence on Convective Morphology and Larger Scale Environment
Nicholas Carletta, Meteorology, College of Liberal Arts & Sciences (Mentor: William Gallus)

I.E.2 August 2010 Flood Inundation Mapping Using GIS and LIDAR Data along the Squaw Creek in Ames, IA
Ryan Spies, Meteorology, College of Liberal Arts & Sciences (Mentor: Kristie Franz)
I.E.3  An Investigation of Silver Maples within Riparian Forest Buffers
Allison Vincent, Environmental Science, College of Agriculture & Life Sciences
(Mentor: Richard Schultz)

SESSION I.F  BIOLOGY & BIOINFORMATICS
Memorial Union, Room 3219
Moderator: David Oliver, College of Liberal Arts & Sciences

I.F.1  Using CViT to Visualize Maps Inferred by the Morgan2McClintock Translator
Reka Kelemen, Bioinformatics, College of Liberal Arts & Sciences (Mentor: Carolyn Lawrence)

I.F.2  Functional analysis of the Hairy Sheath Frayed1 Mutation in Maize
Lindsay Moss-Taylor, Biology, College of Liberal Arts & Sciences (Mentor: Michael Muszynski)

I.F.3  Characterization of the Interaction Between Crop Plants and Plant-Parasitic Cyst Nematodes
Megan Clements, Animal Science, College of Agriculture & Life Sciences (Mentor: Tarek Hewezi)

10:45 – 11:00  Break and Refreshments

11:00 – 12:15  PRESENTATION SESSION II

SESSION II.A  BUSINESS & BEHAVIOR
Memorial Union, Room 3505
Moderator: Danny Johnson, College of Business

II.A.1  The Costs of Freedom: A Qualitative Analysis of the United States Army’s Reception and Discharge Processes
Chris Ward, Finance, College of Business (Mentor: Diane Janvrin)

II.A.2  Training Student Leaders in the Community Advisor Role
Laura Coombs, Management, College of Business (Mentor: Paula Morrow)

II.A.3  The Effect of Irrelevant Information on Source Credibility and Persuasion
Kaci McCleary, Psychology, College of Liberal Arts & Sciences (Mentor: Kevin Blankenship)

SESSION II.B  BIOLOGY, MICROBIOLOGY & GENETICS
Memorial Union, Room 3512
Moderator: Don Beitz, Animal Science

II.B.1  Unraveling the Country Cousin of HIV and its Persistence Across All Stages of Disease in Horses
Yasaira Rodriguez, Microbiology, College of Agriculture & Life Sciences (Mentor: Susan Carpenter)

II.B.2  Optimization for the Detection of Mycoplasma suis by Real-Time PCR
Sidney Hofmann, Biology, College of Agriculture & Life Sciences (Mentor: Erin Strait)

II.B.3  Mycobacterium fortuitum in Seahorses
Anna Bortz, Microbiology, College of Agriculture & Life Sciences (Mentor: Tim Frana)

II.B.4  Pph13 and Photoreceptors: Probing the Origins of Vision in a Marine Worm
Benjamin Bastin, Genetics, College of Liberal Arts & Sciences (Mentor: Stephan Schneider)
SESSION II.C CHEMICAL, MECHANICAL & MATERIALS ENGINEERING
Memorial Union, Room 3534
Moderator: Ted Heindel, Mechanical Engineering

II.C.1 Predicting the Electrocaloric Effect of Ceramics for Electrocaloric Refrigeration
Jordan Barr, Chemical Engineering and Mathematics, College of Engineering
(Mentor: Scott Beckman)

II.C.2 N₂—N₂ Collisional Energy Transfer Effects on Hybrid fs/ps Coherent Anti-Stokes Raman Scattering at Initial Interaction Time Scales
Chloe Dedic, Mechanical Engineering, College of Engineering (Mentor: Terrence Meyer)

II.C.3 Minimizing Environmental Impact with NH₃ Combustion for Heating & Power
Daniel Diaz-Martinez, Mechanical Engineering, College of Engineering (Mentor: Terrence Meyer)

II.C.4 Structure and Physical Properties of New Sodium-Ion Conducting Solid Electrolytes for Sodium Batteries
Seth Berbano, Materials Engineering, College of Engineering (Mentor: Steve W. Martin)

SESSION II.D WRITERS’ FORUM
Memorial Union, Room 3538
Moderator: Stephen Pett, English

II.D.1 Jeff and Conch Shell
Krista Johnson, English and International Studies, College of Liberal Arts & Sciences

II.D.2 So Surely We Live
Matthew Nagel, English, College of Liberal Arts & Sciences

II.D.3 Short Straw
Joshua Sauced, English, College of Liberal Arts & Sciences

II.D.4 The Solution
Rachel Routier, English, College of Liberal Arts & Sciences

II.D.5 A Moment and selected poems
Sarah Tisinger, Journalism & Mass Communication, College of Liberal Arts & Sciences

SESSION II.E SOCIAL & CULTURAL STUDIES
Memorial Union, Room 3538
Moderator: Dawn Sweet, Communications Studies

II.E.1 Cyber Lamentations: Interacting With the Dead in the Virtual World
Levi Farrell, Anthropology, College of Liberal Arts & Sciences (Mentor: Grant Arndt)

II.E.2 Latino Mother-Adolescent and Father-Adolescent Interactions
Angelica Yadira Flores, Spanish and Child, Adult & Family Services, College of Liberal Arts & Sciences and College of Human Sciences (Mentor: Janet N. Melby)

II.E.3 The Family Planning and Contraceptive Methods Utilized By Teen Mothers
Kennesha Woods, Child, Adult & Family Services, College of Human Sciences
(Mentor: Kere Hughes-Belding)

SESSION II.F PHYSICS
Memorial Union, Room 3219
Moderator: Massimo Marengo, Physics & Astronomy

II.F.1 Ion-Specific Induced Charges at Aqueous Soft Interfaces
Rebecca Park, Physics, College of Liberal Arts & Sciences (Mentors: David Vaknin and Alex Travesset)
II.F.2 The Search for Pulverized Planets around Binary Stars
Denise Wood, Physics, College of Liberal Arts & Sciences (Mentor: Massimo Marengo)

II.F.3 Development of a Technique for Magnetic Measurements in Electrostatic Levitation Chamber
Nick Spyrisson, Physics and Statistics, College of Liberal Arts & Sciences (Mentor: Ruslan Prozorov)

12:15 – 12:45 Break & Refreshments, featuring FOCUS Exhibit and artists

12:45 – 2:00 PRESENTATION SESSION III

SESSION III.A PEOPLE & TECHNOLOGY
Memorial Union, Room 3505
Moderator: Chris Harding, Geological & Atmospheric Sciences

III.A.1 Evaluation of Consumer-based Physical Activity Monitors for Physical Activity Promotion
Megan Linden, Dietetics, College of Human Sciences; Mollie Smith, Pre-Diet & Exercise, College of Human Sciences (Mentor: Gregory Welk)

III.A.2 Edudoku: Taking Puzzle Game Interactivity to a New Level
Tom Deering, Computer Engineering, College of Engineering (Mentor: Simanta Mitra)

III.A.3 Weather Forecasting as a Learning Tool in a Large Service Course: Does Practice Make Perfect?
Elizabeth Sues, Meteorology, College of Liberal Arts & Sciences
(Mentors: William Gallus, Jr. and Cinzia Cervato)

III.A.4 Sounds of Hilton Magic
Luke Roling, Chemical Engineering, College of Engineering (Mentor: Rhonda Bonett)

SESSION III.B METEOROLOGY
Memorial Union, Room 3512
Moderator: Cinzia Cervato, Geological & Atmospheric Sciences

III.B.1 Simulation of Nocturnal LLJs with a WRF PBL Scheme Ensemble and Comparison to Observations from the ARM Project
Kristy Carter, Meteorology, College of Liberal Arts & Sciences
(Mentors: William A. Gallus and Adam J. Deppe)

III.B.2 The Variation of Rainfall over the U.S. Corn Belt: Inter-annual and Inter-decadal Changes
Martin P. Coolidge, Meteorology, College of Liberal Arts & Sciences (Mentor: Mike T.C. Chen)

III.B.3 In Search of the Ideal Lead Time: an Empirical Analysis and Social Perspective of the Correlation Between Tornado Warning Lead Times and Casualties
JoBeth Minniear, Meteorology, College of Liberal Arts & Sciences (Mentor: William Gallus)

III.B.4 Climatology of Lake-Effect Precipitation in the Lake Tahoe, CA/NV Region
Samantha Santeiu, Meteorology, College of Liberal Arts & Sciences (Mentor: Neil Laird)
SESSION III.C  DESIGN

Memorial Union, Room 3534
Moderator: Deb Satterfield, Art & Design

III.C.1  Solar Decathlon Interlock House: Its Future
Clark Colby, Architecture and Environmental Studies, College of Design; Dana Sorensen, Architecture, College of Design (Mentor: Ulrike Passe)

III.C.2  Development and Research in Rome Study Abroad Travel Publications
Kimberly Zamora, Graphic Design, College of Design (Mentor: Cheri Ure)

III.C.3  Fashion Comparison of the Bomb and Mademoiselle in the 1940s
Rachel Noce, Apparel, Merchandising, Design & Production, College of Human Sciences (Mentor: Sara Marcketti)

SESSION III.D  SOCIAL SCIENCES

Memorial Union, Room 3538
Moderator: Stephanie Madon, Psychology

III.D.1  The Exclusivity of Economic and Political Interpretations of the Constitution
Michael Belding III, History, College of Liberal Arts & Sciences (Mentor: Dirk Deam)

Whitney Butts, Child, Adult & Family Services, College of Human Sciences (Mentors: Mary Jane Brotherson and Teske Drake)

III.D.3  The Symposium: An Anthropological Approach to Classical Greek Sexuality
Dominque Trumbo, Anthropology, College of Liberal Arts & Sciences (Mentor: Maximilian Viatori)

III.D.4  The Effect of Pre-Admonition Suggestions on Witnesses’ Beliefs They Will Be Good Witnesses
Chris Boden, Finance, College of Business; Megan Krumbholz, Psychology, College of Liberal Arts & Sciences; Kaitlyn Schafer, Psychology, College of Liberal Arts & Sciences; Charles Shivvers, Psychology, College of Liberal Arts & Sciences (Mentor: Deah Quinlivan)

SESSION III.E  BIOLOGY & BIOCHEMISTRY

Memorial Union, Room 3538
Moderator: Clark Coffman, Genetics/Development & Cell Biology

III.E.1  Characterization of a Novel Model to Study Human Retinoblastoma
Pavel Brodskiy, Chemical Engineering, College of Engineering (Mentor: Donald S. Sakaguchi)

III.E.2  Understanding Gene Expression Networks in Mouse and Chicken Retinal Ganglion Cells
Laura Ellison, Biology, College of Liberal Arts & Sciences (Mentor: Jeff Trimarchi)

III.E.3  The Inhibition of HIV-1 by Prunella vulgaris Phenolic Compounds
Johanna Jass, Biochemistry, College of Liberal Arts & Sciences (Mentor: Olga Zabotina)

SESSION III.F  ENERGY & THE ENVIRONMENT

Memorial Union, Room 3219
Moderator: Tom Brumm, Agricultural and Biosystems Engineering

III.F.1  Hunting for “Obese Yeast”: Mutagenesis and Identification of Yeast Cells with Increased Oil Content
Kelly Markham, Chemical Engineering, College of Engineering (Mentors: Basil Nikolau and Marna Yandeau Nelson)
III.F.2 Engineering Ethanologenic *E. coli* for Bio-oil Utilization
*Donovan Layton*, Chemical & Biological Engineering, College of Engineering (Mentor: Laura Jarboe)

III.F.3 Yield Component Comparisons Between Fertilized and Non-Fertilized Diverse Prairies
*Shane Bugeja*, Agronomy, College of Agriculture & Life Sciences (Mentor: Meghann Jarchow)

III.F.4 The Ionic Conductivity of Mixed Glass Former Glasses in the Na2O-B2O3-P2O5 Glass System
*Garrett Olson*, Materials Engineering, College of Engineering (Mentor: Prof. Steve W. Martin)

**2:00 – 2:15 Break & Refreshments**

**2:15 – 3:30 PRESENTATION SESSION IV**

**SESSION IV.A SOCIAL SCIENCES & LINGUISTICS**
Memorial Union, Room 3505
*Moderator: Rhonda Bonett, Psychology*

IV.A.1 Pronunciation Errors in Read and Spontaneous Speech
*Taylor Anne Barriuso*, Linguistics, College of Liberal Arts & Sciences (Mentor: John Levis)

IV.A.2 Physiological Reactions Behind Criminal Confessions
*Michaela Burt*, Psychology, College of Liberal Arts & Sciences (Mentor: Stephanie Madon)

IV.A.3 The Effects of Afrocentrism, Racial Socialization and Discrimination on Psychological Distress among African American College Students
*Mechelle Salley*, Psychology, College of Liberal Arts & Sciences (Mentor: Meifen Wei)

IV.A.4 I Could Tell You Paid Attention! The Effects of Social Interactions on Choosing Rates and Eyewitness Confidence
*Shelby Forsythe*, Psychology, College of Liberal Arts & Sciences; *Aaron Halls*, Psychology, College of Liberal Arts & Sciences; *Reed McIntyre*, Interdisciplinary Studies, College of Liberal Arts & Sciences; *Nicole Vincent*, Psychology, College of Liberal Arts & Sciences (Mentor: Deah Quinlivan)

**SESSION IV.B SCIENCE, FOOD & HEALTH**
Memorial Union, Room 3512
*Moderator: Joan Cunnick, Animal Science and Microbiology*

IV.B.1 Cytotoxicity of *Echinacea paradoxa* Fractions Toward RAW 264.7 Mouse Macrophages
*Kelly Patchett*, Biology, College of Agriculture & Life Sciences (Mentor: Diane Birt)

IV.B.2 Traveler’s Diarrhea Should be Put at a Halt: Investigation Using Transgenic Callus and Transgenic Maize Expressing *Escherichia coli* (E.coli) Heat Labile Toxin B-subunit (LTB)
*Flor De Amelia Hinojo*, Microbiology, College of Agriculture & Life Sciences (Mentor: Joan Cunnick)

IV.B.3 Multiplex PCR for Detection of *Salmonella* in Layer Hen Production Environments
*Allison Berquist*, Food Science & Technology, College of Human Sciences (Mentor: Byron Brehm-Stecher)

IV.B.4 Construction of eae Deletion Mutant of *Escherichia coli* O157:H7 Strain 86-24
*Megan Weems*, Microbiology, College of Agriculture & Life Sciences (Mentors: F. Chris Minion and Mishel Stephenson)
SESSION IV.C  BIOLOGY, BIOCHEMISTRY & GENETICS
Memorial Union, Room 3534
Moderator: Christine Peterson, Veterinary Pathology

IV.C.1  Role of the Surface Oligosaccharide Dimannose with Side Galactose in Pathogenicity of *Leishmania* 
*Raeann Shimak*, Biochemistry and Genetics, College of Liberal Arts & Sciences 
(Mentor: Christine Petersen)

IV.C.2  Modified Ebolavirus VP35 Proteins for Biochemical Studies 
*Alisha Stubbs*, Biochemistry, College of Liberal Arts & Sciences (Mentor: Gaya Amarasinghe)

IV.C.3  Purification of *Yersinia pestis* Proteins from *Bacillus megaterium* 
*Leanne Schulz*, Biology, College of Liberal Arts & Sciences (Mentor: F. Chris Minion)

IV.C.4  Role of Quorum Sensing in *Yersinia pestis*-Human Macrophage Interactions 
*Mackenzie Reed*, Genetics, College of Agriculture & Life Sciences 
(Mentors: F. Chris Minion and Andrew Peterson)

SESSION IV.D  ANIMAL & PLANT SCIENCES
Memorial Union, Room 3538
Moderator: Stephanie Hansen, Animal Science

IV.D.1  PCR Assay Optimization for *Brachyspira* Speciation 
*Dani Techentin*, Animal Ecology, College of Agriculture & Life Sciences (Mentor: Erin Strait)

IV.D.2  A Randomized Clinical Trial Evaluating a Farm-of-Origin Autogenous *M. bovis* Vaccine 
*Stacie Gould*, Animal Science, College of Agriculture & Life Sciences (Mentor: Annette M. O'Connor)

IV.D.3  Comparison of Leaf Crystal Macropatterns in the Allied Genera *Peperomia* and *Piper* (*Piperaceae*) 
*Tiranee Ruchti*, Biology, College of Liberal Arts & Sciences (Mentor: Harry Horner)

IV.D.4  Mapping of Several Ds Transposable Elements on Maize Chromosome 9S 
*Michelle Paulsen*, Biology, College of Liberal Arts & Sciences (Mentor: Erica Unger-Wallace)

SESSION IV.E  MATERIALS & MECHANICAL ENGINEERING
Memorial Union, Room 3558
Moderator: LeAnn Faidley, Mechanical Engineering

IV.E.1  Physical Properties of Mixed Glass Former Glasses in the Na2S + GeS2 + P2S5 Glass System 
*Katherine Schuller*, Materials Engineering, College of Engineering (Mentor: Dr. Steve W. Martin)

IV.E.2  Manufacturing Tracer Particles for X-ray Flow Visualization 
*Andrea Kenney*, Mechanical Engineering, College of Engineering (Mentor: Ted Heindel)

IV.E.3  Manufacturing and Testing of Metal Composites 
*Nicholas Orlowsky*, Mechanical Engineering, College of Engineering (Mentor: Gap-Yong Kim)

SESSION IV.F  SCIENCE, ENGINEERING & THE ENVIRONMENT
Memorial Union, Room 3219
Moderator: Michelle Soupir, Agricultural & Biosystems Engineering

IV.F.1  *E. coli* Concentrations in Streams of an Agricultural Dominant Watershed 
*Andrew Paxson*, Environmental Science, College of Agriculture & Life Sciences (Mentor: Michelle Soupir)
IV.F.2  Utilizing Algae Growth for Oxygen Production and Wastewater Management in Closed Systems  
Rebecca Meerdink, Environmental Science, College of Agriculture & Life Sciences; Celia Clause, Agricultural Engineering, College of Agriculture & Life Sciences (Mentor: Amy Kaleita-Forbes)

IV.F.3  Tillage and Composting Strategies to Maximize Potentially Mineralizable Nitrogen in Maize-Based Cropping Systems  
Kimberly Brown, Agronomy, College of Agriculture & Life Sciences (Mentor: Michael Castellano)