

# Nebraska Summer Research Symposium Directory

University of Nebraska-Lincoln Summer Research 2018

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## Advanced Manufacturing Summer Institute

Dane Allapowa | Poster: 200

Research advisor: Iman Salafian, Mark Nail

Advance Manufacturing Summer Institute, Design, Manufacturing, and Assembly of a Drone

Michael Begay | Poster: 201

Research advisor: Iman Salafian, Mark Nail

Drone Design and Manufacturing Using Computer Aided Design Software and 3D Printing Technology

Ethan Fregien | Poster: 201

Research advisor: Iman Salafian, Mark Nail

Drone Design and Manufacturing Using Computer Aided Design Software and 3D Printing Technology

Rodney Gilpin | Poster: 198

Research advisor: Iman Salafian, Mark Nail

Design and Manufacturing of a Stealth Quadcopter Using Solidworks and 3D Printing Technology

Randy Laben | Poster: 198

Research advisor: Iman Salafian, Mark Nail

Design and Manufacturing of a Stealth Quadcopter Using Solidworks and 3D Printing Technology

Leslie Notah | Poster: 198

Research advisor: Iman Salafian, Mark Nail

Design and Manufacturing of a Stealth Quadcopter Using Solidworks and 3D Printing Technology

Pauline Parrott | Poster: 201

Research advisor: Iman Salafian, Mark Nail

Drone Design and Manufacturing Using Computer Aided Design Software and 3D Printing Technology

Murray Phair | Poster: 200

Research advisor: Iman Salafian, Mark Nail

Advance Manufacturing Summer Institute, Design, Manufacturing, and Assembly of a Drone

Kyle Redsteer | Poster: 200

Research advisor: Iman Salafian, Mark Nail

Advance Manufacturing Summer Institute, Design, Manufacturing, and Assembly of a Drone

Grace Robinson | Poster: 198

Research advisor: Iman Salafian, Mark Nail

Design and Manufacturing of a Stealth Quadcopter Using Solidworks and 3D Printing Technology

Jenna Steeno | Poster: 201

Research advisor: Iman Salafian, Mark Nail

Drone Design and Manufacturing Using Computer Aided Design Software and 3D Printing Technology

Joshua Toddy | Poster: 199

Research advisor: Iman Salafian, Mark Nail

Reverse Engineering, Design, and 3D Print of a Quadcopter

Joseph Yankton | Poster: 199

Research advisor: Iman Salafian, Mark Nail

Reverse Engineering, Design, and 3D Print of a Quadcopter

## Applied Plant Systems

Caitlin de Vries | Poster: 2

Research advisor: Dirac Twidwell

Juniper recovery following initial restoration with extreme fire

Tilly Duong | Poster: 8  
Research advisor: Walter Schacht  
How Does Size of Roadside Wildflower Islands Affect Wildflower Establishment?

Nazanin Ghetmiri | Poster: 4  
Research advisor: Lisa Durso  
Impact of Manure & Nitrogen on the Amount of Antibiotic Resistance Genes in Soil

Marisa Grubb | Poster: 7  
Research advisor: Virginia Jin  
Effects of Corn Residue and Cover Crops on Soil Greenhouse Gas Emissions

Sire Kassama | Poster: 6  
Research advisor: Peter Baenziger  
A Genetic Conundrum: Evaluation of a Wheat Breeding Selection Program

Catherine McManus | Poster: 1  
Research advisor: Ana Vlez Arango and Thomas Weissling  
Exploring Milkweed Health in Agricultural Landscapes

Xavier Miranda-Colon | Poster: 3  
Research advisor: Jess Spotanski  
The Impact of Drone Crop Monitoring on the Efficiency of Research Farms

Charles Moore | Poster: 5  
Research advisor: Marty Schmer  
Nitrogen Source and Rate Effects on Corn Yield and Economics in the Western Corn Belt

## Bioenergy Systems

Christian Butera | Poster: 25  
Research advisor: James Schnable  
Automated Phenotyping of Maize and Pearl Millets Growth Patterns and Drought Stress Responses

Karina Cuate | Poster: 31  
Research advisor: Rebecca Roston  
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Shamira Gonzalez | Poster: 27  
Research advisor: Joshua Herr  
Identification of Unknown Microbes based on Genome Sequencing

Alyssa Grube | Poster: 22  
Research advisor: Paul Black  
Remediation of Wastewater and Drinking Water Using Microalga

Wihib Hankore | Poster: 28  
Research advisor: Paul Blum  
Investigation of Ionomers in Thermotoga Maritima Based Microbial Fuel Cells

Zack Harmer | Poster: 24  
Research advisor: Heriberto Cerutti  
CRISPR/Cas9 mediated knockout of WDTC1 in Chlamydomonas

Trenton Joiner | Poster: 23  
Research advisor: Edgar Cahoon  
RNAi down-regulation of genes to improve lipid and protein quality in Camelina sativa seeds

Regis Kugbe | Poster: 29  
Research advisor: Paul Black  
Abiotic stimulation of lipid accumulation pathways using B Vitamins in *Coccomyxa subellipsoidea* (C-169)

Moiria McNally | Poster: 26  
Research advisor: Jeff Mower  
Post-transcriptional and post-translational processes in a non-flowing plant

Marjorie Nelson | Poster: 21  
Research advisor: Nicole Buan  
Genome Sequencing and Genetic Characterization of the 16S rRNA and mcrA Genes of Methanogen Strains

Josue O'Neill | Poster: 30  
Research advisor: Rajib Saha  
Maximization of Succinic acid production in *Actinobacillus succinogenes* via Genome Scale Metabolic (GSM) Modeling

## Biomedical Engineering Devices

Emily Brooks | Poster: 51  
Research advisor: Forrest Kievit  
Comparison of DNA repair pathway inhibitors in sensitizing brain cancer cells to the DNA damaging effects of radiotherapy

Amanda Cimino | Poster: 58  
Research advisor: Srivatsan Kidambi  
Engineering of Biomimetic Multicellular Liver Model

Lily Foley | Poster: 49  
Research advisor: Angela Pannier  
Characterization of Gelatin Nanoparticles for use in Oral Nonviral Gene Delivery Systems

Sara Hopper | Poster: 48  
Research advisor: Sangjin Ryu  
Print-and-Peel Method for Creating Microfluidic Devices for Biomedical Engineering

Dominique James | Poster: 53  
Research advisor: Greg Bashford  
Cerebrovascular Impulse Response to Tactile Somatosensory and Motor Stimulation measured with fTCD

Michael Miller | Poster: 50  
Research advisor: Angela Pannier  
Effects of Chemical Priming on Non-Viral Gene Delivery in Human Mesenchymal Stem Cells

Logan Piening | Poster: 55  
Research advisor: Benjamin Terry  
Creation of an Injectable Extracellular Matrix for Tissue Engineering of the Intervertebral Disc

Sofia Perez | Poster: 47  
Research advisor: Rebecca Wachs  
Design of a Long-Term Attachment Mechanism for Swallowable

Jeffrey Rodgers | Poster: 57  
Research advisor: Ryan Pedrigi  
Development of an Ultrasonic Bioreactor to Mimic Laminar Blood Flow on Vascular Endothelial Cells

Megan Ruckman | Poster: 52  
Research advisor: Forrest Kievit  
Using Synthetic Lethality to Sensitize Pediatric Brain Cancer Cells to the DNA Damaging Effects of Radiation Therapy

Nicole Schubert | Poster: 54  
Research advisor: Linxia Gu  
Mechanical Characterization of Porcine Descending Aorta and Common Carotid Arteries

Alissa Zeitelhack | Poster: 56  
Research advisor: Rebecca Wachs  
Decellularized Porcine Nucleus Pulposus as Natural Biomaterial for Treatment of Low Back Pain

## Chemical Assembly

Gillian Good | Poster: 44  
Research advisor: Cliff I. Stains  
Phosphinate-Based Rhodol and Fluorescein Derivatives and their Applications as Bioprobes

Layheack Ly | Poster: 90  
Research advisor: Barry Cheung  
Probing Effects of Surface Morphology and Functionalization of Metals on Ice Crystal Nucleation

Nicole Richards | Poster: 41  
Research advisor: Andrzej Rajca  
New Small, Rigid Nitroxide for Site-Directed Spin Labeling of Proteins

Miranda Weigand | Poster: 45  
Research advisor: David Hage  
Analysis of Drug-Protein Interactions by High Performance Affinity Chromatography

## History

Kasha Appleton | Poster: 119  
Research advisor: Katrina Jagodinsky  
“Restrained of Her Liberty”: Habeas Corpus and Child Custody in 19th-Century WA and MO

## Integrated Agronomic Systems

Abigail Borgmeier | Poster: 16  
Research advisor: Roger Elmore  
Corn Growth and Development Following Cover Crops

Kallie Calus | Poster: 10  
Research advisor: Daren Redfearn  
Impacts of Burning, Disking, and Spraying on Big Bluestem Forage Yield and Nutritive Value

Elise Elizondo | Poster: 17  
Research advisor: Roger Elmore  
Delayed Emergence Impact on Corn Ear Formation Issues

Kylee Farabaugh | Poster: 91  
Research advisor: Roger Elmore  
Delayed Emergence Impact on Corn Ear Formation Issues

Brooke George | Poster: 15  
Research advisor: John Guretzky  
Establishment of Interseeded Annual Warm-Season Grasses in Smooth Brome Grass Pastures

Alyssa Kuhn | Poster: 11  
Research advisor: Daren Redfearn  
Effect of Row Spacing on Switchgrass Forage Yield and Nutritive Value

Julia McDowell | Poster: 13  
Research advisor: Humberto Blanco  
Impact of Cover Crop Management on Carbon Sequestration

Emma Richmond-Boudewyns | Poster: 14  
Research advisor: Humberto Blanco  
Managing Soil Erosion With Cover Crops

Nicolas Rivera | Poster: 12  
Research advisor: Daren Redfearn  
Effect of Row Spacing on Legume Establishment in Switchgrass for Bioenergy

## **McNair Scholars Program**

Darius Fox | Poster: 137  
Research advisor: Karsten Koehler  
Body Composition and Metabolic Adaptations Contribute to the Decline in Weight Loss

Kiley Gilbert | Poster: 135  
Research advisor: Cynthia Willis-Esqueda  
Blaming the Innocent: The Effects of Biases on Latino Exonerees Culpability

Carolyn Herrera | Poster: 138  
Research advisor: Kathryn Holland  
Examining Relationships Between Institutional Environment and Mental Health for US Military Sexual Assault Survivors

Elizabeth Otto | Poster: 136  
Research advisor: David DiLillo  
Oh my God, Becky, Look at Her Butt!: Examining African American Womens Sexualization in Hip-hop Music Through Testing Implicit Biases

## **Minority Health Disparities**

Samantha McCreary | Poster: 124  
Research advisor: Kirk Dombrowski  
The Influence of Fear on Drug Injection Behavior: How Fears Affect Injection Partner Choices for PWID in Rural Puerto Rico

Darien McElwee | Poster: 125  
Research advisor: Kirk Dombrowski  
Do You Truly Know Yourself?: A Social Network Analysis of an Inuit Communitys Self-Perceived Helpfulness

Da Yeoun Moon | Poster: 126  
Research advisor: Kirk Dombrowski  
Serosorting as an Indicator of Health Consciousness: An Exploration of the Injection Network in Rural Puerto Rico

Madeleine Uraih | Poster: 127  
Research advisor: Kirk Dombrowski  
Constraint, Centrality, and Indigenous Community: Linking Network Involvement and Health in Nain, Labrador

Selena Velasquez | Poster: 128  
Research advisor: Kirk Dombrowski  
Support for the Socially Withdrawn: A k-core Analysis of an Inuit Community

Logan Young | Poster: 129  
Research advisor: Kirk Dombrowski  
When Where Becomes How: Spatial Context and Risk Behaviors Among People Who Inject Drugs in Puerto Rico

## Materials Research Science and Engineering Center

Fatima Alba | Poster: 86

Research advisor: Alexey Kovalev

Non-linear Transport AMR Response of Antiskyrmions

Joseph Barrera | Poster: 98

Research advisor: Stephen Morin

Quantitative Analysis of Droplet Interface Bilayer Permeability Towards Rational Synthesis of Hybrid Organic/Inorganic Membranes

Ryan Castillo | Poster: 84

Research advisor: Morin

Manipulation of Interfacial Strength Using Geometric and Chemical Patterning

Elvin Cordero Figueroa | Poster: 85

Research advisor: Alexei Lipatov

Mechanical exfoliation and spectroscopic characterization of two-dimensional materials: Graphene and titanium trisulfide (TiS<sub>3</sub>)

Andres Inga | Poster: 97

Research advisor: Shireen Adenwalla

Characterization of Ferromagnetic and Ferroelectric Heterostructures

Giselle Melendez | Poster: 87

Research advisor: Eva Schubert

Atomic Layer Deposition of UltraThin Films: In situ Ellipsometry Growth Characterization

Kathaleen Ortiz | Poster: 100

Research advisor: Xiaoshan Xu

X-Ray Analyzation of TiFe<sub>2</sub>O<sub>5</sub> Made with Solid State Reactions

Pablo Paradis | Poster: 88

Research advisor: Jeffrey Shield

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Stephanie Richins | Poster: 89

Research advisor: Jeffrey Shield

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Dylan Richmond | Poster: 96

Research advisor: Peter Dowben

Optical and Transport Properties of Inkjet Printed Mixed Halide Hybrid Perovskites

Alexsis Thornton | Poster: 99

Research advisor: Stephen Morin

Synthesis of Alginate Micro-Particles in Printed Fluidic Devices

Nolan White | Poster: 101

Research advisor: Stephen Ducharme

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## Nanohybrid Functional Materials

Samuel Boardman | Poster: 92

Research advisor: Patrick Dussault

Synthesis of a novel diazirine- and alkyne-containing fatty acid as a clickable photoaffinity probe.

Khalil Bryant | Poster: 59

Research advisor: Mathias Schubert

Aspect Ratio Driven Optical Properties of Glancing Angle Deposited Thin Films



Sean Cranford | Poster: 63  
Research advisor: Dennis Alexander  
Dynamics of Self-Propelled Jumping Condensate on Superhydrophobic Femtosecond Laser Processed Surfaces

Margaret Elpers | Poster: 60  
Research advisor: Rebecca Lai  
Design and Fabrication of an Electrochemical Peptide-based Uranium Sensor Using a Peptide Probe with Two Phosphothreonine Residues

Brandon Hacha | Poster: 62  
Research advisor: David Hage  
Measurement of Protein-Analyte Binding Affinities Using Ultra-Thin Layer Affinity Chromatography

Katherine Schietroma | Poster: 61  
Research advisor: Albert Nguyen  
Effects of Stiffness, Stiffness Gradients, and Micro- and Nanoimprinting for Nonviral Gene Delivery in hMSCs

## National Nanotechnology Coordinated Infrastructure

Trevor Butler | Poster: 64  
Research advisor: Sangjin Ryu  
Vorticella Patterning In Microfluidic Systems

Bridger Irons | Poster: 65  
Research advisor: Grigoriy Sereda  
3-D Printing from Custom-Made Materials

Tyler Ishman | Poster: 69  
Research advisor: Shudipto Dishari  
Nanoscale Understanding of Polymer Thin Films in Renewable Energy Applications

Jesse Kuebler | Poster: 67  
Research advisor: Ruiguo Yang  
Synthesis of Alginate Microgels for Cancer Cell Encapsulation, Preservation, and Culture

Thomas Ott | Poster: 66  
Research advisor: Parashu Kharel  
Magnetic and Magnetocaloric Properties of  $R_2Fe_{17}$  ( $R = Y, Nd$  and  $Pr$ ) - Based Compounds

Karl Satterlund | Poster: 68  
Research advisor: Shireen Adenwalla  
Magnetoelectric Characterization of a Ferromagnetic Cobalt/Ferroelectric Vinylidene Fluoride Multilayer Thin Film

## Nebraska Center for Energy Sciences Research

Michael Bengston | Poster: 122  
Research advisor: Xia Hong  
Integrating Hybrid Halide Perovskite with Layered Two-Dimensional Materials for Constructing Light Weight, High Efficiency, Flexible Solar Cells

Jeannie Lozowski | Poster: 121  
Research advisor: Patrick Dussault  
Synthesis of Novel Polyunsaturated Odd-Carbon Dicarboxylic Acids as New Polymer Feedstocks

Caleb Schmidt | Poster: 123  
Research advisor: Xiaoshan Xu  
Magnetic Force Microscopy on  $NiCo_2O_4$

Ananth Venkatachalam | Poster: 120  
Research advisor: Chris Cornelius  
Comb Shaped Anion Conductive Ionomer Films for Electrochemical Energy Storage Devices

## Nebraska Center for Materials and Nanoscience High School Interns

Arnavaz Adenwalla | Poster: 112  
Research advisor: Xia Hong  
Scanning Probe Studies of Ferroelectric Thin Films Using Piezoelectric Force Microscopy

Alexander Belashchenko | Poster: 108  
Research advisor: Shireen Adenwalla  
Effects of Surface Acoustic Waves on Domain Wall Motion of Co/Pt Multilayers

Jonathan Gerdes | Poster: 113  
Research advisor: Xiaoshan Xu  
Structural Analysis of Single Crystal Thin Films using X-Ray Diffraction

Grace Hilfiker | Poster: 109  
Research advisor: Shudipto Dishari  
Deposition of Nafion Solutions

Sarah Melton | Poster: 102  
Research advisor: Rebecca Y. Lai  
Use of Serine- and Phosphoserine- containing Peptides in the Design and Fabrication of Electrochemical Uranium Sensors

Blake Pfeiffer | Poster: 106  
Research advisor: Lisha Fan  
Advanced fs laser surface modification of tungsten carbide

Miriya Pinkermanl | Poster: 111  
Research advisor: Stephen Morin  
Hand-Operable Elastomeric Devices

Gabriel Pribil | Poster: 103  
Research advisor: Yongfeng Lu  
Advanced Fs-Laser Machining of Glass

Johanna Schubert | Poster: 104  
Research advisor: Angela Pannier  
Development of Human Mesenchymal Stem Cell Transfection Media for Enhancing Non-Viral Gene Delivery

Cole Shank | Poster: 110  
Research advisor: Stephen Ducharme  
Preparation and Electrical Testing of Organic Ferroelectric Crystals

Kate Tadesse | Poster: 105  
Research advisor: Bai Cui  
Laser Shock Processing in Ceramic Materials

Kelsey Wright | Poster: 107  
Research advisor: Prof. Yongfeng Lu  
Advanced Fs-Laser Machining of Ceramics

## Plant Pathology

Jeremy Brown | Poster: 9  
Research advisor: Lirong Zeng  
Agrobacterium-mediated Transient Expression of AtFti1B Truncated Mutations in Nicotiana benthamiana

## Redox Biology

Logan Brown | Poster: 39

Research advisor: Rodrigo Franco

The Role of Fatty Acid Oxidation in Astroglial Xenobiotic Detox

Rachel Eckmann | Poster: 35

Research advisor: James Alfano

Genome-wide Identification of *P. Syringae* Virulence Genes Essential for Plant Infection by Transposon Sequencing (Tn-seq)

Benjamin Fennell | Poster: 33

Research advisor: Donald Becker and Yizi Mao

Characterization of *E. coli* Proline Utilization A Mutant D439A

Karina Herrera | Poster: 34

Research advisor: Jaekwon Lee

Metal Induced Activation of c-Met Receptor Tyrosine Kinase in Hepatocytes

Remington Hoerr | Poster: 37

Research advisor: Limei Zhang

Investigations into the Effects of Iron-Sulfur Clusters on the Fluorescence of mCherry-WhiB1 Fusion Proteins

Guy Kunzmann | Poster: 38

Research advisor: Oleh Khalimonchuk

New Genetic Tools to Study Mitochondrial Protein Import

Carolyn Lorch | Poster: 32

Research advisor: Seung-Hyun Ro

Sestrin2 is required for mitophagy induction upon mitochondria-damaging heavy metal Cu stress in mouse embryonic fibroblasts

Moises Rodriguez | Poster: 40

Research advisor: Rodrigo Franco

The Role of Fatty Acid Oxidation in Astroglia Xenobiotic Detox

Ronald Woodruff | Poster: 36

Research advisor: Liangcheng Du

Physiological Role of the Conversion of Modified Phenazines in *Lysobacter Antibioticus* OH13

## Sustainability of Horizontal Civil Networks in Rural Areas

Lianne Brito | Poster: 78

Research advisor: Christine Wittich

Response of Agricultural Components and Resilience of Rural Communities to Natural Hazards

Carlos Coria | Poster: 77

Research advisor: Ashraf Aly Hassan

Comparing Polymer Matrices to Support Algae Immobilization for the Treatment of Nitrate from Groundwater

Margaret Eubanks | Poster: 79

Research advisor: Jerald Bricker, Daniel Snow, Shannon Bartelt-Hunt

Microplastic pollution in Nebraskas water systems: quantity and composition

Ian Giancarlo | Poster: 83

Research advisor: Yusong Li

Deposition of Silicon Dioxide Janus Nanoparticles Using QCM-D

Bridget Gile | Poster: 76

Research advisor: Xu Li

Effectiveness of Solarization Treatment as an Intervention Strategy to Reduce Antibiotic Resistant Bacteria in Cattle Manure Stockpiles

Omar Hassan | Poster: 82  
Research advisor: Shannon Bartelt-Hunt  
Fate of Terrestrial Microplastics

Xinyu Lin | Poster: 81  
Research advisor: Joshua Steelman  
Increasing Bridge Lifespan in Rural Areas Using Artificial Neural Networks

Samantha Lopez | Poster: 74  
Research advisor: Daniel Linzell  
Health Monitoring Schemes for Double-Track Steel Railway Bridges

John Mart Noriega | Poster: 80  
Research advisor: John Sangster  
Best Practices for Simulating Multi-Lane Roundabouts

Claudia Ponce de Leon | Poster: 75  
Research advisor: Elizabeth Jones  
New Directions: Using Virtual Reality for Laboratory Teaching in Traffic Engineering

## Systems Biology of Plant and Microbiome

Ashley Foltz | Poster: 20  
Research advisor: Guangchao Sun  
Differences in the responses to nutrient stress of the root systems of maize and its domesticated and wild relatives

Chloe Jensen | Poster: 18  
Research advisor: Daniel Schachtman and Phyllis Higley  
Evaluations of Bacterial Seed Treatments for Root Zone Colonization in Maize and Sorghum

Kami Kucera | Poster: 19  
Research advisor: Edgar Cahoon and Jerald Bricker  
Development of a Synthetic Biology Toolbox For Root-Microbe Interaction In Rice

## Undergraduate Creative Activities & Research Experience (UCARE)

Gabe Astorino | Poster: 174  
Research advisor: Massimiliano Pierobon, Jiantao Guo, Wei Niu  
Improving Early Detection of the Emerald Ash Borer

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