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SURP

Summer Undergraduate Research Program



July 30, 2021

Ballroom, Maucker Student Union

SURP

Summer Undergraduate Research Program

University of Northern Iowa

Visit: scholarworks.uni.edu/surp/



A message from Dr. John Fritch,

DEAN, COLLEGE OF HUMANITIES, ARTS AND SCIENCES

Welcome to the Summer Undergraduate Research Symposium!

Today recognizes and celebrates the work of UNI undergraduate researchers this summer. We, as a college, are exceptionally proud of the work of these students. While many students are working at odd jobs to earn money over the summer and some are enjoying their time off from classes, these students are putting forth hours of work to develop themselves through hands-on research in a laboratory or field setting. Their summers have been filled exploring questions in which they are interested and working closely with UNI faculty. They have learned a variety of lessons: how to formulate questions, how to develop answers to those questions, how to work with faculty and peers, and how to break (and repair!) instrumentation. Today we celebrate the work of these students, and we thank those who made their work possible. Many of the students are supported by generous gifts from alums and friends of UNI; others are supported by the hard-earned grants of the faculty with whom they work. I am grateful to the donors and faculty for their support of these students.

Please enjoy the day.



SYMPOSIUM SCHEDULE

10:00 AM - 1:30 PM

Set Up

10:00 — 11:00 am

Poster Session open to SURP teams for set-up and networking.

Welcome & Keynote

11:00 — 11:30 am

Zoom panel — Recent Alumni share their post-undergraduate experiences.

Keynote Panelists

*Keynote Emcee — **Marcy Seavey**, STEM Coordinator, University of Northern Iowa*

Dr. Selena Losee, DO (Biology, 2011)

Selena is a graduate of Des Moines University and currently Chief Resident of Psychiatry at the University of South Dakota Sanford School of Medicine.

Riley (Mullins) Plagge (Environmental Science, 2017)

Riley recently graduated with an Environmental Engineering MS from University of Iowa and is now an engineer at GHD in Des Moines.

Nicole (Bishop) North (Chemistry & Biochemistry, 2019)

Nicole is currently seeking her PhD at The Ohio State University where she has been awarded Future Investigators in NASA Earth and Space Science and Technology award.

Poster Session & Luncheon

11:30 am — 1:15 pm

Luncheon Sponsored by the College of Humanities, Arts and Sciences

Closing Remarks, Luncheon Area

1:15 — 1:30 pm

The SURP Symposium will be located in the Maucker Union Ballrooms in order to allow increased space for presenters and participants. Participants are encouraged to follow CDC guidance, including the use of masks by individuals who are not fully vaccinated. Our keynote presentation and a small selection of student presentations will be available virtually. If you would prefer to attend virtually, please contact STEM Coordinator, Marcy Seavey (Seavey@uni.edu) for an invitation to the zoom session.

UNI utilizes the Scholarworks Digital Scholarship platform to store and showcase student and faculty work. This summer's SURP research will be added to the SURP Collection in Scholarworks after the event.

Thank you to the individuals, foundations, and organizations which have made this year's SURP research possible.

PARTICIPANTS & POSTER LOCATIONS

(1) **ALEXIS J. MOORE**, MICHAEL H. WALKER (BIOLOGY)

Selecting for Durability in Bacillus cereus/anthracis Bacteriophages

(2) **AMBER FINKE**, CARL THURMAN, JAMES DEMASTES (BIOLOGY)

The mitochondrial genome of the spiny-wristed fiddler crab, Leptuca spinicarpa Rathbun 1900

(3) **CLAIRE KIPP**, CARL THURMAN, MELANIE J. HOPKINS (BIOLOGY)

Geometric morphometric analysis of fiddler crabs from the shore of the western Atlantic Ocean

(4) **DEE DEE PITZEN**, CARL THURMAN, FRANK H. BARNWELL (BIOLOGY)

Curating a global collection of fiddler crabs for the American Museum of Natural History, NYC

(5) **EMMA PELLEGRINO**, MAREK SLIWINSKI (BIOLOGY)

Limit of Detection in Escherichia Coli DNA using PCR (working title)

(6) **GRETCHEN STEFFENSMEIER**, DR. LAURA JACKSON (BIOLOGY)

Correlation between forb frequency and grass frequency in expiring CP-25 plantings

(7) **JOSEPH CORREA**, MAREK SLIWINSKI, EMMA PELLEGRINO (BIOLOGY)

Evaluation of Pre-lysis Rinses To Improve DNA Yield and Purity

(8) **NOAH BOND**, JERREME JACKSON (BIOLOGY)

*Characterization of the Intestinal Mucin Role in Colonization of the
Spodoptera frugiperda Midgut*

(9) **SAMANTHA HEYER**, CARL THURMAN, FRANK H. BARNWELL (BIOLOGY)

Curating a global collection of fiddler crabs for the American Museum of Natural History, NYC

(10) **SAMRIN SHAHNAZ**, KENNETH ELGERSMA (BIOLOGY)

Soil Organic Carbon Accumulation in Restored Native Prairies Over Time

PARTICIPANTS & POSTER LOCATIONS

(11) **SCHUYLER HOP**, DR. LAURA JACKSON, (BIOLOGY)

Comparison of expiring CP-25 and 3-year old CP-42 plantings for monarch habitat quality

(12) **SIERRA HILL**, JERREME JACKSON (BIOLOGY)

Enterococcus faecalis Colonization of the Helicoverpa zea Midgut Epithelium

(13) **BRIYANA CARTER**, SHOSHANNA COON, KIRK MANFREDI
(CHEMISTRY AND BIOCHEMISTRY)

Investigating the Unknown Purple Substance from Newsprint Paper

(14) **CAITLYN NUEHRING**, DR. JUSTIN PETERS
(CHEMISTRY AND BIOCHEMISTRY)

Developing New Yeast Strains to Investigate Gene Looping

(15) **COBEY HEINEN**, SHOSHANNA COON
(CHEMISTRY AND BIOCHEMISTRY)

Raman Spectroscopy: Investigation of Acidic Azure B on Titanium Dioxide Nanoparticles

(16) **FELICIEENNE ALEXANDRE**, SHOSHANNA COON, KIRK MANFREDI
(CHEMISTRY AND BIOCHEMISTRY)

COMPARISON OF CHALK TYPES AND THEIR GHOSTING EFFECTS

(17) **KYLE BISCOGLIA**, DR. KIRK MANFREDI
(CHEMISTRY AND BIOCHEMISTRY)

Identification of Fungi and Their Secondary Metabolites from Wind Cave

(18) **STEVEN GOMEZ**, DR. JOSHUA SEBREE
(CHEMISTRY AND BIOCHEMISTRY)

The Phosphorescence of Wind Cave Cavern, and the Level of Organics Associated with it

(19) **ROSE PERKSEN**, DR. JUSTIN PETERS
(CHEMISTRY AND BIOCHEMISTRY)

*Visualizing Human RAD51 Protein Binding to Single-Stranded DNA
Using Atomic Force Microscopy*

PARTICIPANTS & POSTER LOCATIONS

- (20) **WILSON McNAUGHTON**, JOSHUA SEBREE, ROWAN MCCARTHY,
(CHEMISTRY AND BIOCHEMISTRY)
Analog Studies of Organic Pathways in Wind Cave through Cave Water and Crystals
- (21) **AARON WALKER**, DHERYTA JAISINGHANI, SARAH DIESBURG,
HAROON RASHID (COMPUTER SCIENCE)
SocioApp: Detecting Your Sociability Status with Your Smartphone
- (22) **BRANDON PURVIS**, DHERYTA JAISINGHANI, SARAH DIESBURG,
HAROON RASHID (COMPUTER SCIENCE)
Exploring Mesh Networks for Smart Buildings
- (23) **CASEY CRONIN**, SARAH DIESBURG, DHERYTA JAISINGHANI
(COMPUTER SCIENCE)
On the Vulnerability of OpenThread to Agile Denial of Service Attacks
- (24) **GERARDO (DANNY) JACOBO**, CHAD ELLIOTT HEINZEL, LUKE KAPAYOU
(EARTH AND ENVIROMENTAL SCIENCES)
Soil analyses supporting Meskwaki Settlement Food Sovereignty, Tama County Iowa
- (25) **MADISON MCKENNA**, ALAN CZARNETZKI
(EARTH AND ENVIROMENTAL SCIENCES)
Structure of the Atmospheric Boundary Layer During PM2.5 NAAQS Exceedances in Iowa
- (26) **TRISHYAN ANTHONY**, THOMAS HOCKEY
(EARTH AND ENVIROMENTAL SCIENCES)
The Solar Eclipse of 1869 as seen in Illinois, Indiana, and Kentucky
- (27) **SYDNEY HAUSER**, DR. ADRIENNE STANLEY (MATHEMATICS)
Visibility of Lattice Points
- (28) **AARON KIRCHMAN**, DR. ALI TABELI (PHYSICS)
Stochastic Monte Carlo Simulations of Competing Nucleoproteins on Single-Stranded DNA
- (29) **ADAM RAMKER**, PAVEL LUKASHEV (PHYSICS)
Electronic, magnetic, and structural properties of CoMnVSb

(30) **COLIN GORGIN**, DR. ANDREW STOLLENWERK (PHYSICS)
Diffusion of Gold on WSe₂

(31) **DHRUV PATEL**, DR. ALI TABELI (PHYSICS)
Investigating Fractal Properties of Stochastic Financial Data

(32) **JACOB SCHEEL**, DR. TIM KIDD (PHYSICS)
Sustainable and Biodegradable Nanocellulose Composite Materials

(33) **LUKAS STUELKE**, PAVEL LUKASHEV (PHYSICS)
Chemical substitution induced half-metallicity in CrMnSb_{0.5}Si_{0.5}

(34) **MADELYN JOHNSON**, JEFF MORGAN
AND LAWRENCE ESCALADA (PHYSICS)
Virtual vs. In-Person Instruction: The Impact of Teachers' Understanding of Physics

(35) **NATHAN SCHMIDT**, DR. TIM KIDD (PHYSICS)
Implementation of a Nanocellulose 3D Printer

(36) **YOUNG MOUA**, PAUL SHAND (PHYSICS)
Electrical Transport Measurements on Ni Films Deposited on MoS₂

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MATHEMATICS

PHYSICS

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