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Recommended Citation

University of Northern Iowa. Sumer Undergraduate Research Program., "2022 Summer Undergraduate Research Program" (2022). *Summer Undergraduate Research Program (SURP) Symposium Programs*. 10.
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UNI University of Northern Iowa

SURP

Summer Undergraduate Research Program

July 29, 2022

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University of Northern Iowa

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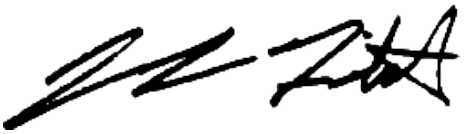
A message from Dr. John Fritch,

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

11:00 AM - 1:30 PM

Welcome & Keynote 11:00 — 11:30 am

Miriam Patton

Miriam Patton is a 1983 graduate of UNI with a Major in Biology/Interpretation. She went on to the University of Wisconsin-Stevens Point, where she received an MS in Natural Resource Management/Environmental Education & Interpretation. She spent 32 years as Palo Alto County Conservation Board Naturalist in Northwest Iowa, devoting her career to conservation management, and providing education and recreation opportunities for all ages.

Poster Session & Luncheon 11:30 am — 1:15 pm

Luncheon Sponsored by the UNI College of Humanities, Arts and Sciences.

Poster presentations will be presented by undergraduates from the Biology, Chemistry & Biochemistry, Computer Science, Earth & Environmental Sciences, Mathematics, Physics, and Science Education. Departments. Army Education & Outreach Program High School STEM Apprentices and visiting High School Scholars will also present as special guests of SURP.

Closing Remarks, Luncheon Area 1:15 — 1:30 pm

PARTICIPANTS & POSTER LOCATIONS

(1) ABBY SLIWINSKI, MAREK SLIWINSKI, EMMA PELLEGRINO, NICOLE GEERDES (BIOLOGY)
Exploring Cave Microbes at Windcave National Park

(2) BRODY JACK, AI WEN, MILA HAYNES (BIOLOGY)
Evaluation of methods to extract genetic material from wild bees

(3) EVA VAN DE MORTEL, LAURA JACKSON (BIOLOGY)
Tillage, fire and herbicide affect invasive grass and monarch host plants on CRP fields

(4) JACEY MEIER, DR. LAURA JACKSON (BIOLOGY)
Impact of Lumbricus terrestris on seed predation in prairie restoration

(5) KYLE TRUNNELL, TILAHUN ABEBE (BIOLOGY)
Can tef (Eragrostis tef Zucc.), an East African Crop, Adapt to Iowa?

(6) MILA HAYNES, AI WEN, BRODY JACK (BIOLOGY)
Using Environmental DNA (eDNA) to Assess Pollinator Communities in Cedar Valley

(7) TAYLOR PRUISMAN, AMBER FINKE, CARL THURMAN, FRANK BARNWELL -BENEFACTOR (BIOLOGY)
Curating a Global Collection of Grapsoid crabs for the American Museum of Natural History, NYC

(8) WALDERLANDE NICOLAS, MICHAEL H. WALTER (BIOLOGY)
Characterizing Selected, Durable Bacillus cereus/anthracis Bacteriophages

(9) LIZ WILGENBUSCH, AI WEN (BIOLOGY)
Comparison of Plant Richness and Density in CRP-42 Fields

(10) WILLIAM (BILLY) LANGE, MOLLY RAMKER, JESSE WILCOX, DORI CLAUSEN (BIOLOGY/SCIENCE EDUCATION)
Why do effective science teachers persist?

(11) ABBIE BANGS, JUSTIN PETERS (CHEMISTRY AND BIOCHEMISTRY)
Identification of Microorganisms from the Depths of Wind Cave

(12) ALEXIS WIRTZ, JOSHUA SEBREE, DONALD GAFF (CHEMISTRY AND BIOCHEMISTRY)
Chromatography-Mass Spectroscopy Analysis of Native American Pottery for Maple Syrup Residue

(13) JADE NUEHRING, KIRK MANFREDI (CHEMISTRY AND BIOCHEMISTRY)
Bioactive Secondary Metabolites from Cave Dwelling Fungi

(14) JENNA HEINEN, JOSHUA SEBREE (CHEMISTRY AND BIOCHEMISTRY)
Spectroscopic Characterization of Crystals and Waters at Wind Cave

(15) LYDIA RICHARDSON, DAWN DEL CARLO (CHEMISTRY AND BIOCHEMISTRY)
The State of Safety Training, Facilities, and Resources for Chemistry Teachers: A National Survey

(16) LYDIA RICHARDSON, DAWN DEL CARLO (CHEMISTRY AND BIOCHEMISTRY)
Attitudes toward the Chemistry Laboratory Learning Environment using Different Pedagogies and Assessment Protocols

(17) SAMRIN SHAHNAZ, JUSTIN PETERS (CHEMISTRY AND BIOCHEMISTRY)
Using Atomic Force Microscopy to Study DNA and RAD51 Protein Interaction

(18) TANZEEL UR REHMAN, DHERYTA JAISINGHANI, SARAH DIESBURG, ANDREW BERNS (COMPUTER SCIENCE)
Towards understanding the robustness of flying mesh network

(19) SAM OWENS, DHERYTA JAISINGHANI, SARAH DIESBURG, ANDREW BERNS (COMPUTER SCIENCE)
Quantifying the Impact of IoT networks when co-existing with Production WiFi Network

PARTICIPANTS & POSTER LOCATIONS

(20) VESA XERSA, ANDREW BERNS, DHERYTA JAISINGHANI, SARAH DIESBURG (CHEMISTRY AND BIOCHEMISTRY)
Leveraging ML to Detect the Interference Patterns of Co-Existing IoT and Non-IoT networks

(21) WINFRED AFEANEKU, ANDREW BERNS, DHERYTA JAISINGHANI, SARAH DIESBURG (COMPUTER SCIENCE)
SocioApp: Neural Networks to Detect How Social Are You?

(22) JACOB BASKIN, THOMAS HOCKEY (EARTH AND ENVIROMENTAL SCIENCES)
The Total Solar Eclipse of 1869 in Iowa: What Remains Today

(23) LINDSEY HUBBELL, CHAD HEINZEL (EARTH AND ENVIRONMENTAL SCIENCES)
Geoenvironmental implications on Food Sovereignty on the Meskwaki Settlement, Tama County, Iowa

(24) MAYA MALLAVARAPU, CHAD HEINZEL (EARTH AND ENVIRONMENTAL SCIENCES)
Geoenvironmental controls of residential Radon on the Iowan Erosion Surface

(25) NIC DUFFY, CHAD HEINZEL (EARTH AND ENVIRONMENTAL SCIENCES)
Geoarchaeology of the 1926 Seeberger Excavation, Jackson County Iowa

(26) ROWAN MCCARTHY, MOHAMMAD IQBAL (EARTH AND ENVIRONMENTAL SCIENCES)
Development of a Water Quality Index Calculation Tool using Excel

(27) KEVIN DEMLER, BILL WOOD (MATHEMATICS)
Rendezvous Numbers of Compact and Connected Spaces

(28) LUKAS STUELKE, ADRIENNE STANLEY (MATHEMATICS)
Left-Separation on ω1

(29) ASHLEY HARRINGTON, TIMOTHY KIDD, JEFFREY CARLSON (PHYSICS)
Infrared Spectroscopy of Nanocellulose

(30) JEFFREY CARLSON, TIMOTHY KIDD, ANDREW STOLLENWERK (PHYSICS)
Ultraflat Au surfaces on deposited MoS2

(31) JOSHUA WOLFF, TIMOTHY KIDD (PHYSICS)
Gold Film on MoS2 Surface Roughness Dependence on Heating Temperature

(32) NATHAN SCHMIDT, TIMOTHY KIDD (PHYSICS)
A Lite DAQ System for Precision Resistance Measurements

(33) SABRYN LABENZ, ALI TABEI (PHYSICS)
Nucleoprotein Competition on ssDNA: Stochastic Monte Carlo Model

(34) ZACH POTTEBAUM, PAUL SHAND, YOUNG MOUA (PHYSICS)
Magnetic Properties of FeCrVAl-Based Materials

(35) AUSTIN HEIDBREDER, MARTIN CHIN (CHEMISTRY & BIOCHEMISTRY)
Using an Aminimide Polymer to Extract Lithium from a Brine Solution

(36) JACOB PARKER, MARTIN CHIN (CHEMISTRY & BIOCHEMISTRY)
Extracting Lithium using the steric bulk of an Aminimide Functional Group

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Private individuals who support undergraduate research with gifts of $1000 or more:

Mark Butterworth
Drs. Jeff and Kim Rathmell
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Richard Jourdan
Drs. Guang Jin and Fank Ju
David and Lois Kail
Dr. Alan and Karen Orr
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Dr. Becky and Danny Rose
Drs. David and Cathy Swanson
Dr. Virginia Weimar
Dr. Darrell Wiens and Arleen Cook
Charles and Dawn Helscher
Dr. Frank Barnwell
Dr. Susan Woo
Dr. Steven and Merry Heilmann
James and Diane Sass
Bill and Teri Brecht

2022 Summer Undergraduate Research Acknowledgments

DEAN'S OFFICE, COLLEGE OF HUMANITIES, ARTS AND SCIENCES

SUMMER UNDERGRADUATE RESEARCH PROGRAM (SURP)

STUDENT OPPORTUNITIES FOR ACADEMIC RESEARCH (SOAR) - SOAR PROVIDES SUPPORT FOR UNDERGRADUATE STUDENT RESEARCH ACTIVITIES IN MATHEMATICS, SCIENCES, AND TECHNOLOGIES. STUDENTS ARE AWARDED UP TO $750 FOR SOFTWARE, LAB SUPPLIES, TRAVEL, AND EXTERNAL LAB FEES.

UNI DEPARTMENTS OF:

BIOLOGY

CHEMISTRY AND BIOCHEMISTRY

COMPUTER SCIENCE

EARTH AND ENVIRONMENTAL SCIENCES

MATHEMATICS

PHYSICS

UNI STEM SUPPORT SERVICES OFFICE, ACADEMIC AFFAIRS

UNI FACULTY STARTUP FUNDS

Special Thanks to Panther Educational Products, UNI Department of Applied Engineering and Technical Management for Poster Printing

2022 Summer Undergraduate Research Acknowledgments

U.S. DEPARTMENT OF ENERGY

U.S. DEPARTMENT OF AGRICULTURE

IOWA SPACE GRANT CONSORTIUM

THE LOUIS STOKES ALLIANCES FOR MINORITY PARTICIPATION (LSAMP)

NATIONAL ATMOSPHERIC AND SPACE ADMINISTRATION (NASA)

NATIONAL SCIENCE FOUNDATION (NSF) - DIVISION OF MATERIALS RESEARCH

2022 University of Northern Iowa High School Research Apprentices are funded by the Army Education and Outreach Program (AEOP)


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