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## 2017 Summer Undergraduate Research Symposium

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$(u, t) \in L^2(\mathcal{D})$   
1) base for  $L^2(X)$   
$$T(t, x) = \sum_{j \in \mathbb{N}} B_j(t, e_j(x))$$
  
 $(B_j)_{j \in \mathbb{N}}$  indep. B.T.'s  
 $\|W(t, s)\|_{L^2(\mathcal{D})} < \infty$   
 $X_T = u(0, X_T)$

# SUMMER UNDERGRADUATE RESEARCH SYMPOSIUM

JULY  
28  
2017

SEERLEY  
HALL

**CHAS** COLLEGE OF HUMANITIES,  
ARTS AND SCIENCES  
University of Northern Iowa



*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

Seerley 115

**Dr. John Fritch**, Dean  
College of Humanities, Arts and Sciences

## Keynote Speaker

Seerley 115

**Michael Jarosh**, Senior Associate Scientist  
Amgen, Cambridge, Massachusetts

*Mr. Jarosh is a 2003 graduate (Chemistry, BS) and research student under Dr. Martin Chin, 2017 recipient of the Regents Award for Faculty Excellence.*

## Poster Session

Great Reading Room

**Light luncheon available**

## PARTICIPANTS & POSTER LOCATIONS

(1) **MEGANN SCHMIDT**, ZACHARY SPERSTAD  
AND DR. PETER BERENDZEN (BIOLOGY)

*Rates and Patterns of Evolution in a Duplicated Genome in the Family Catostomidae*

(2) **AMANDA KOENIG** AND DR. DARRELL WIENS (BIOLOGY)

*Binding Competition for a Developmentally Important Receptor in the Synapse during Neural Development: Is Folic Acid Interfering with Glutamic Acid?*

(3) **BRIA WOLFF** AND DR. DARRELL WIENS (BIOLOGY)

*Alteration of Embryonic Neuronal Outgrowth via Modification of Synaptic Receptor*

(4) **KYLIE JONAS** AND DR. LAURA JACKSON (BIOLOGY)

*Effects of Planting Time and Grass-Forb Seeding Ratio Influence Establishment in CRP Pollinator Habitat*

(5) **GABRIELLE BROWN** AND DR. LAURA JACKSON (BIOLOGY)

*A Floral Resource Index to Assess Pollinator Habitat Quality in Eastern Iowa Prairies*

(6) **ESTHER EDGERTON** AND DR. LAURA JACKSON (BIOLOGY)

*Factors Affecting Cirsium arvense Density in Eastern Iowa Conservation Reserve Program Fields*

(7) **MOLLY LANGHENRY** AND DR. MARK SHERRARD (BIOLOGY)

*The Weeds of CRP Pollinator Habitat*

(8) **ALEC GLIDDEN** AND DR. MARK SHERRARD (BIOLOGY)

*Soil Legacy Effects of Prairie Biomass Feedstocks with Different Diversity*

## PARTICIPANTS & POSTER LOCATIONS PARTICIPANTS & POSTER LOCATIONS

(9) **CHANDLER DOLAN, KATHLEEN MADSEN,**  
DR. MARK MYERS AND DR. AI WEN (BIOLOGY)

*Bee and Butterfly Response to Floral Resources in Central Iowa Prairie Restorations*

(10) **NICOLE BISHOP,** EMMA SHIPLEY AND DR. JOSHUA A. SEBREE  
(CHEMISTRY & BIOCHEMISTRY)

*In Situ Photo-kinetics and Spectroscopy of Organic Aerosols*

(11) **EMMA SHIPLEY,** NICOLE BISHOP AND DR. JOSHUA A. SEBREE  
(CHEMISTRY & BIOCHEMISTRY)

*Prebiotic Potential of Aerosols*

(12) **JOSH PRYBIL** AND DR. ROBERT MARTIN CHIN  
(CHEMISTRY & BIOCHEMISTRY)

*Silylation of Pyridine and Pyridine Derivatives using Diruthenium Catalysts*

(13) **RODNEY WALLACE, ERIC GLEITER**  
AND DR. ROBERT MARTIN CHIN (CHEMISTRY & BIOCHEMISTRY)

*Analysis of the Silylation of Pyridine*

(14) **NINA JOCIC** AND DR. ROBERT MARTIN CHIN  
(CHEMISTRY & BIOCHEMISTRY)

*Synthesis, Characterization, and Protonation of a Diruthenium Dimethyl Complex*

(15) **NIA MCCLENDON** AND DR. ROBERT MARTIN CHIN  
(CHEMISTRY & BIOCHEMISTRY)

*Syntheses, Characterization and Reactivity of Diruthenium Complexes  
with Disubstituted Phenanthroline Ligands*

(16) **KAITLYN PARROTT** AND DR. JEFFREY ELBERT  
(CHEMISTRY & BIOCHEMISTRY)

*Synthesis and Coupling Schemes of Naphthalimide Compounds with Target Drugs*

(17) **TREASURE DIVIS** AND DR. JEFFREY ELBERT  
(CHEMISTRY & BIOCHEMISTRY)

*Reaction Schemes for the Synthesis of Photo-Active  
Naphthalimide-Drug Compounds*

(18) **PRATIMA RAUT,** KATHERINE PLOTZKE, DR. JOSHUA SEBREE  
AND DR. SHOSHANNA COON (CHEMISTRY & BIOCHEMISTRY)  
*Surface Chemistry of Crystal Violet on Titanium Dioxide Under Acidic Conditions*

(19) **BRIAN M. PAULEY,** SEYEDEH Z. MOOSAVI AND  
DR. COLIN L. WEEKS (CHEMISTRY AND BIOCHEMISTRY)

*Building a Bigger Bridge Between Metal Atoms:  
Synthesis of 1, 4-bis(4-aminopyridine)-trans-2-butene*

(20) **DMYTRO V. KRAVCHUK,** JOSHUA W. PRYBIL,  
DR. COLIN L. WEEKS (CHEMISTRY AND BIOCHEMISTRY),  
MICHAEL M. KUNTZ, JAKE R. PARKS, DR. PAUL M. SHAND (PHYSICS)  
AND DR. ARKADY ELLERN (CHEMISTRY, ISU)

*Synthesis and Magnetic Properties of Cobalt(II)-Pyrazine Metal-Organic Frameworks*

(21) **RISHABH DALAL,** CARSON TURNER AND  
DR. ALEKSANDAR POLEKSIC (BIOINFORMATICS)

*Developing Accurate Databases of Adverse Drug Reactions*

(22) **PAIGE LA PLANT** AND DR. CHAD HEINZEL  
(EARTH AND ENVIRONMENTAL SCIENCES)

*Archaeometric Analysis of Greek and Phoenician Ceramics from Selinunte, Sicily*

(23) **RYAN BUTCHER** AND DR. CHAD HEINZEL  
(EARTH AND ENVIRONMENTAL SCIENCES)

*Geochemical Signatures of Quaternary Sediments from the  
East-Central and Southern Iowa Drift Plains*



(24) **AYANNA WALLICAN GREEN** AND DR. CHEPINA RUMSEY  
(MATHEMATICS EDUCATION)  
*Teacher Questioning: A Case Study of a Kindergarten Teacher*

(25) **JAKE WEBER** AND DR. ADRIENNE STANLEY (MATHEMATICS)  
*Exploration of Counter Examples of Balance Sets in  $Z_p \times Z_p$*

(26) **XIAOXIAO LIU** AND DR. RUI HE (PHYSICS)  
*Raman Spectroscopy of  $HgCr_2Se_4$*

(27) **CHUHAN WANG** AND DR. RUI HE (PHYSICS)  
*Raman Studies of  $TiSe_2$  Atomic Layers*

(28) **GAIHUA YE** AND DR. RUI HE (PHYSICS)  
*Raman and Transport Studies of  $V_2O_5$  Thin Flakes*

(29) **JAKE PARKS, MICHAEL KUNTZ**, DR. PAUL SHAND (PHYSICS)  
AND DR. LAURA STRAUSS (CHEMISTRY & BIOCHEMISTRY)  
*Magnetic Phase Transitions in Bulk Crystalline  
Manganese-intercalated Tantalum Disulfide*

(30) **KRISTINE NIELSEN** AND DR. TIM KIDD (PHYSICS)  
*3D Printing with Chocolate*

(31) **KEEGAN MORRISSEY** AND DR. TIM KIDD (PHYSICS)  
*Optimizing Nanocellulose Aerogels*

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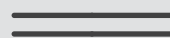
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BIOLOGY  
CHEMISTRY AND BIOCHEMISTRY  
COMPUTER SCIENCE  
EARTH AND ENVIRONMENTAL SCIENCES  
MATHEMATICS  
PHYSICS

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