



MINNESOTA ACADEMY OF SCIENCE

—Promoting Excellence in Science Since 1873—

**86th Annual Meeting of the
Minnesota Academy of Science
&
32nd Winchell Undergraduate
Research Symposium**

*Celebrating 32 Years of Excellence in
Undergraduate Research*



Century College, White Bear Lake, MN

April 27, 2019

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Century College

Megan Jaunich
Century College

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University of Northwestern--St. Paul

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Century College

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Century College

Dr. Joann Pfeiffer
Century College

Dr. Aeisha Thomas
Crown College

Celia Waldock
MAS Executive Director

Dr. Wayne Wolsey
Macalester College

Kris Zierman
MAS Administrative Manager

About the Annual Meeting & Winchell Undergraduate Research Symposium

The Annual Meeting & Winchell Undergraduate Research Symposium provides a forum for undergraduate students to present original STEM research, learn from professionals in fields they aspire to enter, and receive recognition for their accomplishments.

The first Annual Meeting of the Minnesota Academy of Science was held on April 15, 1933 at the University of Minnesota. Over the years, the annual meeting took on several forms, ranging from lectures to archaeological excursions. In 1981, the Board of Directors decided to add an undergraduate research symposium hosted in conjunction with the Annual Meeting.

There are four main components of the meeting and symposium – a keynote lecture, poster presentations, oral presentations, and breakout sessions. More than 125 students, research advisors, MAS members, faculty, and other interested members of the community attend the symposium each year.

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Anonymous, In memory of **M.I. (Buzz) Harrigan**
Bethel University, Natural and Behavioral Sciences
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Macalester College, Department of Biology
St. Catherine University, School of Humanities, Arts, and Sciences
St. Olaf College, Natural Sciences and Math
University of Minnesota, Department of Psychology
University of Minnesota—Duluth, Department of Pharmacy Practice and Pharmaceutical Sciences
University of Northwestern—St. Paul, Department of Biology and Biochemistry
University of St. Thomas, Departments of Biology and Chemistry
and the Undergraduate Research Opportunities Program

Schedule of Events – April 27, 2019

8:00-8:45	Registration and Poster Set-Up	Lincoln Mall
8:45-9:00	Opening Remarks <i>Welcome by Dr. Jessica Bell, Century College</i> <i>Speaker Introduction by Dr. Joanna Klein, University of Northwestern--St Paul</i>	Lincoln Mall
9:00-10:00	Keynote Address <i>"Tiny Earth Network: Studentsourcing Antibiotic Discovery" by Dr. Jo Handelsman, Director of the Wisconsin Institute for Discovery at the University of Wisconsin-Madison and Founder of the Tiny Earth Network</i>	Lincoln Mall
10:15-11:00	Breakout Session 1 <i>"Changing the World through Science"</i> <i>Panel of Industry Professionals</i> <i>Panel of Graduate Students</i> <i>Fab Lab Tour and 3D Bioprinting Program</i> <i>"Bringing Antibiotic Discovery and Student Research into the Curriculum" (for faculty)</i>	Lincoln Mall E2315 E2313 E2650 E2317
11:15-12:00	Breakout Session 2 <i>Panel of Industry Professionals</i> <i>Panel of Graduate Students</i> <i>Fab Lab Tour and 3D Bioprinting Program</i> <i>"The Fallacy of Fairness: Unconscious Bias in Science" (for faculty)</i>	E2315 E2313 E2650 E2317
12:00-12:45	Box Lunch	Lincoln Mall
12:45-2:15	Oral Presentations <i>Set-up and introductions at 12:45; presentations begin at 1:00.</i> Chemistry Cellular / Molecular Biology Biochemistry; Organismal & Physiological Sciences	E2313 E2315 E2317
2:15-3:00	Poster Session A: Odd Numbers	Lincoln Mall
3:00-3:45	Poster Session B: Even Numbers	Lincoln Mall
3:45-4:00	Refreshments	Lincoln Mall
4:00-4:15	Closing Remarks & Awards	Lincoln Mall
4:15	Poster Take-Down <i>Presenters: Please help us by putting away your easel. Thank you!</i>	Lincoln Mall

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Special Thanks to our Faculty Judges

Dr. Dave Blackburn, *Faculty*, Century College

Dr. L. Karuna Chintapenta, *Assistant Professor*, University of Wisconsin - River Falls

Paul Dykes, *Faculty*, Century College

Dr. Jerry Husak, *Associate Professor*, University of St. Thomas

Dr. Karen Klyczek, *Professor*, University of Wisconsin - River Falls

Dr. Tami McDonald, *Assistant Professor*, St. Catherine University

Dr. Mark Rutherford, *Associate Dean*, University of Minnesota - St. Paul

Dr. Heather Sklenicka, *Instructor*, Rochester Community and Technical College

Dr. Aeisha Thomas, *Associate Professor*, Crown College

Dr. Amy Verhoeven, *Professor*, University of St. Thomas

Dr. Joseph West, *Assistant Professor*, Winona State University

Keynote Speaker

Dr. Jo Handelsman

Dr. Jo Handelsman is the Director of the Wisconsin Institute for Discovery at the University of Wisconsin--Madison, a Vilas Research Professor, and Howard Hughes Medical Institute Professor. She previously served as a science advisor to President Barack Obama as the Associate Director for Science at the White House Office of Science and Technology Policy (OSTP). She served in this capacity for three years until January 2017 and was on the faculty at the University of Wisconsin and Yale University before that. She received her Ph.D. in Molecular Biology from the University of Wisconsin--Madison and has since authored over 200 scientific research publications, 30 editorials, and 29 essays. She has authored numerous articles about classroom methods and mentoring and she is co-author of six books about teaching - *Entering Mentoring and Scientific Teaching*.



Dr. Handelsman is responsible for groundbreaking studies in microbial communication and work in the field of metagenomics. She is also widely recognized for her contributions to science education and diversity in science. Notably, she received the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring from President Obama in 2011, and in 2012, *Nature* named her one of “ten people who mattered this year” for her research on gender bias in science.

Research in the Handelsman lab focuses on understanding diversity in microbial communities and their role in infectious disease. Dr. Handelsman is especially interested in understanding the genetic basis for stability of microbial communities, the role of a gut community as a source of opportunistic pathogens, and the soil microbial community as a source of new antibiotics and antibiotic resistance genes.

Breakout Session 1 (10:15 – 11:00):

"Changing the World through Science"

Lincoln Mall

Dr. Jo Handelsman describes her scientific career as she moved from the University to the White House and back again.

Panel of Industry Professionals

E2315

Facilitator: *Megan Jaunich, Engineering Faculty at Century College*

Panelists: *Rob Hecker, Sr Field Service Engineer at Sciex*
Jennifer Reinhart, Engineer at Boston Scientific
Molly Smith, Technical Service Specialist at 3M
Dr. Richard Walsh, Sr Staff Scientist at Ecolab

Panel of Graduate Students

E2313

Facilitator: *Dr. Joann Pfeiffer, Chemistry Faculty at Century College*

Panelists: *Julia Leone in Conservation Biology*
Brian Trieu in MD/PhD
Becky Rodriguez in Chemistry
Joel Updyke in Pharmaceuticals

Fab Lab Tour and 3D Bioprinting Program

E2650

Daniel Sorby, Bioprinting Facility Manager at the University of Minnesota

For Faculty:

"Bringing Antibiotic Discovery and Student Research into the Curriculum"

E2317

Dr. Joanna Klein and Dr. Jessica Bell lead this opportunity for faculty to connect with Tiny Earth Partner Instructors to share best practices and learn about opportunities.

Breakout Session 2 (11:15 – 12:00):

Panel of Industry Professionals

E2315

Facilitator: *Megan Jaunich, Engineering Faculty at Century College*

Panelists: *Rob Hecker, Sr Field Service Engineer at Sciex*
Jennifer Reinhart, Engineer at Boston Scientific
Molly Smith, Technical Service Specialist at 3M
Dr. Richard Walsh, Sr Staff Scientist at Ecolab

Panel of Graduate Students

E2313

Facilitator: *Dr. Joann Pfeiffer, Chemistry Faculty at Century College*

Panelists: *Julia Leone in Conservation Biology*
Brian Trieu in MD/PhD
Becky Rodriguez in Chemistry
Joel Updyke in Pharmaceuticals

Fab Lab Tour and 3D Bioprinting Program

E2650

Daniel Sorby, Bioprinting Facility Manager
at the University of Minnesota

For Faculty:

"The Fallacy of Fairness: Unconscious Bias in Science"

E2317

Dr. Jo Handelsman discusses current research
in science education with faculty.

Oral Session Schedule (12:45 – 2:15 p.m.)

E2313: Chemistry

- 1:00 **COMPUTATIONAL PREDICTIONS OF AIR SENSITIVITY FOR PRIMARY PHOSPHINES**
Emily J. Landgreen, Bethany A. Palen, and Joseph K. West (Advisor)
Department of Chemistry
Winona State University, Winona, MN
- 1:15 **GREEN, FACILE METHOD FOR THE SYNTHESIS OF PHOSPHINE SULFIDES AND SELENIDES**
Der Vang, Ashley Olichwier, and Joseph K. West (Advisor)
Department of Chemistry
Winona State University, Winona, MN
- 1:30 **A MORE EFFICIENT SYNTHETIC PATHWAY TO A MULTITUDE OF NOVEL OXAZOLIDINONE ANTIBACTERIAL AGENTS**
Connor R. Schmidt and J. Thomas Ippoliti (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN
- 1:45 **PRIMARY PHOSPHINES: NEW SYNTHETIC METHODS AND NEW TARGETS**
Bethany A. Palen, Emily J. Landgreen, and Joseph K. West (Advisor)
Department of Chemistry
Winona State University, Winona, MN



American Chemical Society

Oral Session Schedule (12:45 – 2:15 p.m.)

E2315: Cellular / Molecular Biology

- 1:00 **COMMERCIALY AVAILABLE *Copaifera reticulata* ESSENTIAL OIL DECREASES MARKERS OF INFLAMMATION IN RAW 264.7 CELLS**
Brendan P. Reich and Joyce Doan (Advisor)
Department of Biology
Bethel University, St. Paul, MN
- 1:15 **EFFECT OF RESVERATROL ON GENE EXPRESSION DURING MACROPHAGE ACTIVATION**
Luke Berger and Joyce Doan (Advisor)
Department of Biology
Bethel University, St. Paul, MN
- 1:30 **THE EFFECTS OF FGF10 KNOCK DOWN ON GENE EXPRESSION IN LUNG DEVELOPMENT OF *Xenopus laevis***
Claire E. Sautner and Brian Hyatt (Advisor)
Department of Biology
Bethel University, St. Paul, MN
- 1:45 **PREVENTATIVE ADMINISTRATION OF TOPICAL Δ^9 -TETRAHYDROCANNABINOL (THC) REDUCES MAST CELL ACCUMULATION AND MECHANICAL SENSITIVITY IN A MURINE MODEL OF HAPTEN-INDUCED VULVAR PAIN**
Elizabeth R. Emanuel, Erica Arriaga-Gomez, and Devavani Chatterjea (Advisor)
Department of Biology
Macalester College, St. Paul, MN
- 2:00 **ROLE OF *etv1* AS A POTENTIAL DOWNSTREAM TRANSCRIPTION FACTOR OF FGF SIGNALING IN *Xenopus laevis* LUNG DEVELOPMENT**
Maria Pecoraro and Brian A. Hyatt (Advisor)
Department of Biological Sciences
Bethel University, St. Paul, MN



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Oral Session Schedule (12:45 – 2:15 p.m.)
**E2317: Biochemistry /
Organismal & Physiological Sciences**

- 1:00 **THE EFFECTS OF WINTER STRESS ON THE PHOTOSYNTHETIC RECOVERY OF *Pinus strobus* AND *Picea glauca***
Michael Wettschreck and Amy Verhoeven (Advisor)
Department of Biology
University of St. Thomas, St. Paul, MN
- 1:15 **NATURAL PRODUCT EXTRACTION AND CHARACTERIZATION OF ANTIMICROBIALS FROM *Pseudomonas***
Dominick J. Jenkins and Joanna R. Klein (Advisor)
Department of Biology and Biochemistry
University of Northwestern—St. Paul, St. Paul, MN
- 1:30 **THE CONTRACTILE EFFECTS OF *Salvia sclarea* ON SMOOTH MUSCLE TISSUE ISOLATED FROM THE UTERINE HORNS OF *Mus musculus***
Samuel M. Adamson and Teresa F. DeGolier (Advisor)
Department of Biological Sciences
Bethel University, St. Paul, MN
- 1:45 **A NOVEL EX OVO CULTURING VESSEL DESIGNED FOR EXPERIMENTATION ON CHICKEN EMBRYO'S CHORIOALLANTOIC MEMBRANE**
Nicholas Ziebell, Brooke Salo, Hannah Pavek, Maddie Hentges, and Mary Ann Yang (Advisor)
Department of Biology
Concordia University, St. Paul, MN

Full abstracts may be found in the
Journal of Abstracts of the
Minnesota Academy of Science
available online at **www.mnmas.org**.

Poster Session by Poster Number

- 1 **ANTIBIOTIC GENE IDENTIFICATION IN *Pseudomonas***
Caleb S. Sokovich, Kelsey J. Rothermel, and Joanna Klein (Advisor)
Department of Biochemistry and Biological Sciences
University of Northwestern—St. Paul, St. Paul, MN
- 2 **ATTENUATION OF G-WIRE SELF-ASSEMBLY USING G-QUADRUPLEX LIGANDS**
Elias S. Kinfu and Thomas C. Marsh (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN
- 3 **CHARACTERIZATION OF THE TRANSMEMBRANE REGION OF A NOVEL CEFTAZIDIME RESISTANCE GENE**
Rylie K. McDonell, Hongliu Wang, and Justin J. Donato (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN
- 4 **INVESTIGATING PLANT BASED MEDIA FORMULATIONS WITH YEAST EXTRACT SUPPLEMENTATION FOR PROPAGATION OF *Bacillus* SPECIES**
Katie J. Carlson, Rachel E. Carlson, and Thomas C. Marsh (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN
- 5 **LIPIDS IN *Tetrahymena thermophila*, A UNICELLULAR CILIATE**
Wed Al-Nod, Hannah J. Nilsson, Abigail Shimota, and Laura Listenberger (Advisor)
Department of Biology
St. Olaf College, Northfield, MN
- 6 **REDUCED FUNCTION OF *Citrullus lanatus* (WATERMELON) GLYOXYSOMAL MALATE DEHYDROGENASE DUE TO A MUTATION AT AMINO ACID 269**
Anh M. Huynh, Aaron Day, Kaylin Gerloff, Kumail Walji, and Tamara L. Mans (Advisor)
Department of Biology
North Hennepin Community College, Brooklyn Park, MN
- 7 **STUDYING *Staphylococcus aureus*, A GOLDEN (BEARS) OPPORTUNITY**
Natasha L. Bennett, Adalia F. Dualan, Zachary J. Moeller, Amanda J. Bronsnahan (Advisor), and Taylor J. Mach (Advisor)
Department of Science
Concordia University, St. Paul, MN
- 8 **USE OF N-METHYL MESOPORPHYRIN AS A PARALLEL G-DNA STRUCTURE PROBE FOR G-WIRE ASSEMBLY INTERMEDIATES**
Duyen Su, Elias Kinfu, and Thomas C. Marsh (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

- 9 **ANALYSIS OF CYCLIN E IN FIBROLAMELLAR HEPATOCELLULAR CARCINOMA**
Katrina S. Vang, Lauren Magnuson, and Mary Ann Yang (Advisor)
Department of Science
Concordia University, St. Paul, Minnesota
- 10 **BISPHENOL-A LEADS TO OVEREXPRESSION OF ESTROGEN RECEPTORS AND DIMINISHES PROTECTIVE CHEMOKINE RESPONSES IN A ZEBRAFISH MODEL**
Luis Alvarez, Cecily Choy, Pavana Khan, Courtney Kimmell, Tamara Scott, Eliza Skoler, Gavin Young, and Debby Walser-Kuntz (Advisor)
Department of Biology
Carleton College, Northfield, MN
- 11 **CLONING AN AMMONIUM TRANSPORTERS FROM AN EARLY LAND PLANT *Marchantia polymorpha***
Marie K. Olson and Tami R. McDonald (Advisor)
Department of Biology
St. Catherine University, St. Paul, MN
- 12 **CONTINUING WITH TINY EARTH AT RIVER FALLS**
Emily M Schleicher, Brooke Sorenson, AubreyMarie Evasco, Claire Kelzer, Lathadevi Chintapenta (Advisor), and Karen Klyczek (Advisor)
Biology Department
University of Wisconsin—River Falls, River Falls, WI
- 13 **ISOLATION AND ANALYSIS OF *Arthrobacter globiformis* PHAGE QUI**
Shawna Larson, J. Alfred Bonilla (Advisor), and Karen Klyczek (Advisor)
Biology Department
University of Wisconsin—River Falls, River Falls, WI
- 14 **ISOLATION AND ANALYSIS OF TWO PHAGES INFECTING *Microbacterium paraoxydans***
Ahmed Abdullah, Sunny Ransibrahmanakul, Karen Klyczek (Advisor), and J. Alfred Bonilla (Advisor)
Department of Biology
University of Wisconsin—River Falls, River Falls, WI
- 15 **ISOLATION AND ANALYSIS OF VIBAKI, A PHAGE INFECTION *Arthrobacter globiformis***
Joe Alexander, Helena Humphreys, Cally Robertson, Karen Klyczek (Advisor), and J. Alfred Bonilla (Advisor)
Department of Biology
University of Wisconsin—River Falls, River Falls, WI

- 16 **NOVEL ANTIBIOTIC PRODUCTION IN ANTIBIOTIC-RESISTANT BACTERIA**
Jason Vaysberg, Gregory Rossi, Alma Boric, Victoria Krawiec, and Renu Kumar (Advisor)
Department of Biology
Minneapolis College, Minneapolis, MN
- 17 **OVER-EXPRESSION OF MEIS-1 IN *Xenopus laevis***
Rebecca Robinson and Brian Hyatt (Advisor)
Department of Biology
Bethel University, St. Paul, MN
- 18 **PROTEOME QUANTIFICATION DURING CELL CYCLE TRANSITIONS IN CANCER CELLS**
Madrigal von Muchow¹, Calandra Sagarsky², and Irina St. Louis² (Advisor)
¹*Department of Biology, Macalester College, St. Paul, MN.*
²*Department of Medicine, University of Minnesota, Minneapolis, MN*
- 19 **RESISTING ANTIBIOTIC RESISTANCE: DISCOVERY AND EXTRACTION OF AN ANTIBIOTIC FROM *Bacillus cereus***
Mariah B. Fitzpatrick and Joanna R. Klein (Advisor)
Department of Biology and Biochemistry
University of Northwestern—St. Paul, St. Paul, MN
- 20 **SEQUENCING AND ANALYSIS OF ANTIBIOTIC PRODUCING BACTERIA FROM RABBIT FECES**
Kayla Petry and Joanna Klein (Advisor)
Department of Biology and Biochemistry
University of Northwestern—St. Paul, St. Paul, MN
- 21 **SEQUENCING THE GM2A GENE: IMPLICATIONS FOR LATE-ONSET TAY-SACHS**
Luis R Balderrama, Wendy Vo, Elizabeth Johnson, and Jodi Goldberg (Advisor)
Department of Biology
Hamline University, St. Paul, MN
- 22 **SEQUENCING THE HEXB GENE: IMPLICATIONS FOR LATE ONSET TAY-SACHS**
Wendy Vo, Luis Balderrama, Elizabeth Johnson, and Jodi Goldberg (Advisor)
Department of Biology
Hamline University, St. Paul, MN
- 23 **A COMPUTATIONAL ANALYSIS OF CANDIDATE NON-COVALENT ORGANOCATALYSTS FOR AN ASYMMETRIC [2,3]-WITTIG REARRANGEMENT**
Conor B. Abraham and Joshua P. Layfield (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

- 24 **DEGRADATION PROFILE OF AN IRON-POLY(LACTIC ACID) COMPOSITE**
Thomas J. Lee¹, Brittany B. Nelson-Cheeseman (Advisor)¹, and Eric H. Fort (Advisor)²
¹*Department of Mechanical Engineering*
²*Department of Chemistry*
University of St. Thomas, St. Paul, MN
- 25 **DESIGN AND TESTING OF A MERCURY-FREE SCHLENK LINE BUBBLER**
Sara E. Johnson and Joseph K. West (Advisor)
Department of Chemistry
Winona State University, Winona, MN
- 26 **DEVELOPMENT OF A NEW MOLECULAR GEOMETRY OPTIMIZER FOR THE QUANTUM CHEMISTRY COMMON DRIVER AND DATABASES ENVIRONMENT**
Alexander G. Heide, Rollin A. King¹ (Advisor), and Lori A. Burns² (Advisor)
¹*Department of Chemistry, Bethel University, St. Paul, MN*
²*School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA*
- 27 **DONOR ATOM AND RING SIZE EFFECTS OF PLATINUM (II) COMPLEXES WITH SULFUR CONTAINING LIGANDS**
Megan E. Moberg and Daron E. Janzen (Advisor)
Department of Chemistry and Biochemistry
St. Catherine University, St. Paul, MN
- 28 **THE MITIGATION OF PHOTOINDUCED DNA-OXIDATION BY USING ANTIOXIDANTS FOUND IN FOODS UNDER DIFFERENT TEMPERATURE SETTINGS**
Tom Yang and Heather Sklenicka (Advisor)
Department of Chemistry
Rochester Community and Technical College, Rochester, MN
- 29 **MODIFYING GLASSY CARBON ELECTRODES WITH GRAPHENE OXIDE DERIVATIVES TO CONTROL CONDUCTIVITY**
Alexandra J. Schmeltzer and Gina J. Mancini-Samuels (Advisor)
Department of Chemistry
St. Catherine University, St. Paul, MN
- 30 **MONOPHOSPHONIUM SALTS OF BISPHOSPHINES AS FACILE PRECURSORS TO BISPHOSPHINE MONOXIDES**
Kacey M. Davitt and Joseph K. West (Advisor)
Department of Chemistry
Winona State University, Winona, MN
- 31 **NOVEL SYNTHESIS OF AN OXAZOLIDINONE ANTIMICROBIAL AGENT**
Martina Golden and J. Thomas Ippoliti (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

- 32 **OPTIMIZING THE SYNTHESIS OF A NOVEL TETRADENTATE MIXED DONOR LIGAND**
Sam A. Brunclik, Alex M. Mench, **Melanie H. Nevins**, Emily L. Nolan, Anna K. Olson, Monica Osnaya, Andrew J. Reuter, Chris M. Seong, and Elodie E. Marlier (Advisor)
Department of Chemistry
St. Olaf College, Northfield, MN
- 33 **POLYMERIZATION OF THERMAL ASPARTATE BY GREEN CHEMISTRY**
Thy Duong and Heather Sklenicka (Advisor)
Department of Chemistry
Rochester Community and Technical College, Rochester, MN
- 34 **RATIONAL DESIGN OF TRIBOLUMINESCENT MANGANESE (II) COMPLEXES**
Maya S. Butler and Daron E. Janzen (Advisor)
Department of Chemistry
St. Catherine University, St. Paul, MN
- 35 **SOLID-STATE STUDIES OF DERIVATIVES FORMED BY REACTION OF NITROGENOUS BASES WITH ALDOSES: THE CRYSTAL STRUCTURE OF THE 2-FLUOROPHENYLHYDRAZONE OF D-MANNOSE**
Andrew B. Smith and William H. Ojala (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN
- 36 **A SUSTAINABLY SOURCED DEGRADABLE POLYMER FROM LIGNIN**
Cecelia Kinane¹, Brittany Nelson-Cheeseman² (Advisor), Dr. Eric Fort¹ (Advisor)
¹*Department of Chemistry*
²*Department of Engineering*
University of St. Thomas, St. Paul, MN
- 37 **SYNTHESIS AND CHARACTERIZATION OF HYDROGEL-GRAPHENE/MAGNETITE COMPOSITE MATERIALS**
Katelyn J. Watkin and Kannan Sivaprakasam (Advisor)
Department of Chemistry and Biochemistry
St. Cloud State University, St. Cloud, MN
- 38 **SYNTHESIS OF A NOVEL OXAZOLIDINONE ANTIBACTERIAL AGENT**
Bailey C. Keffer and J. Thomas Ippoliti (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN
- 39 **TOWARDS ISOMORPHOUS “BRIDGE-FLIPPED ISOMERS”:
INVESTIGATIONS OF 4-PYRIDL AND GLOXAL-BASED SYSTEMS**
Ella M. Moróne and William H. Ojala (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

- 40 **BACTERIAL GROWTH FROM VARIOUS SOIL SOURCES**
Ellianna N. Peterson, Taylor N. Krueger, Aeisha Thomas (Advisor), and Donald Hardy (Advisor)
Department of Math and Science
Crown College, St. Bonifacius, MN
- 41 **THE EFFECT OF MARINE TRAFFIC ON BOTTLENOSE DOLPHIN (*Tursiops truncatus*) BEHAVIOR IN THE RÍA DE AROUSA IN GALICIA, SPAIN**
Shannon E. Moore^{1,2}, Séverine Methion¹ (Advisor), and Bruno Díaz López¹ (Advisor)
¹*Bottlenose Dolphin Research Institute BDRI, O Grove, Spain*
²*Department of Biology, St. Olaf College, Northfield, MN*
- 42 **FOSSIL CORAL AND OCEAN CARBON CYCLING**
Ella Hagopian, Katie Murney, Brenden Ireland, Anne Gothmann¹ (Advisor), and Matthew Richey² (Advisor)
¹*Department of Environmental Studies*
²*Department of Mathematics, Statistics, and Computer Science*
St. Olaf College, Northfield, MN
- 43 **INTERACTION EFFECTS OF BURN TREATMENT AND FLORAL DISPLAY ON REPRODUCTIVE SUCCESS WITHIN *Liatris aspera* AND *Solidago speciosa***
Julie A. Bailard¹, Sarah E. Allaben¹, Lea Richardson², and Stuart Wagenius²
¹*Department of Biology, Carleton College, Northfield, MN*
²*Echinacea Project, Chicago Botanic Garden, Glencoe, IL*
- 44 **INVASIVE AND NATIVE SPECIES COFUNCTION TO CREATE SUITABLE HABITAT FOR ENDANGERED CHINOOK SALMON (*Oncorhynchus tshawytscha*)**
Soledad Soto^{1,2}, **Bashir Ali**^{1,3}, Nusrat Noor^{1,4}, and Brent Hughes⁵ (Advisor)
¹*University of California Santa Cruz Doris Duke Conservation Scholars, Santa Cruz, CA*
²*University of California Berkeley, Berkeley, CA*
³*St. Olaf College, Northfield, MN*
⁴*University of Florida, Gainesville, FL*
⁵*Friday Harbor Labs, University of Washington and Department of Biology, Sonoma State University, Rohnert Park, CA*
- 45 **NEST CHARACTERISTICS OF *Glaucomys volans* WITHIN ITASCA STATE PARK**
Rachel A. Berg¹, Amanda Zak², and Joseph C. Whittaker³ (Advisor)
¹*Department of Ecology, Evolution, and Behavior*
²*Department of Fisheries, Wildlife, and Conservation Biology*
University of Minnesota, Minneapolis, MN
³*Department of Biology*
Concordia College, Moorhead, MN
- 46 **PHOTOPROTECTION IN RESPONSE TO DESICCATION IN BRYOPHYTES**
Jerry Willour, Brandt Berube, and Amy Verhoeven (Advisor)
Department of Biology
University of St. Thomas, St. Paul, MN

- 47 **RESOURCE USE OF SMALL PRAIRIE MAMMALS**
Lisa Fisher, Yilin Song, Liz Wilson, Diane Angell (Advisor), and Sharon Lane-Getaz (Advisor)
Departments of Biology and Math, Computer Science, and Statistics
St. Olaf College, Northfield, MN
- 48 ***Daphnia* AND MIXED ALGAE, PREDATION AND COMPETITION: A LOOK AT STOICHIOMETRIC MODELING**
Jesse Elder, Jack Welsh, Isaac Slagel, Bruce Pell (Advisor), and Anne Walter (Advisor)
Department of Mathematics, Statistics, and Computer Science
St Olaf College, Northfield, MN
- 49 **FRAMING OF CULTURE WAR ISSUES IN CONGRESSIONAL CAMPAIGN WEBSITES**
My Khe B. Nguyen, Jessica E. Whittenburg, Jack M. Wolf, Paul J. Roback (Advisor), and Christopher B. Chapp (Advisor),
Department of Mathematics, Statistics, and Computer Science
St. Olaf College, Northfield, MN
- 50 **INVESTIGATING THE EFFECT OF VALUES AFFIRMATION ON THE PERSISTENCE AND PERFORMANCE OF INTRODUCTORY CHEMISTRY STUDENTS**
Zhaoliang Zhou, David Besky, Matthew Whear, Elodie Marlier (Advisor), Laura Listenberger (Advisor), and Robert Eisinger (Advisor)
Department of Chemistry
St. Olaf College, Northfield, MN
- 51 **THE EFFECTS OF INTRA-BURST FREQUENCY IN COORDINATED RESET NEUROMODULATION FOR PARKINSONIAN NON-HUMAN PRIMATE**
Rajiv Dharnipragada, Sinta Fergus, Jianyu Zhang, Gregory Molnar, Luke Johnson, Jerrold Vitek, and Jing Wang (Advisor)
Department of Neurology
University of Minnesota, Minneapolis, MN
- 52 **PREPARING FOR LIFE AFTER ST. OLAF**
Yanglu Pu, Joshua Pelayo, Jordan Donald Moran, Nate Jacobi (Advisor) and Kathryn Ziegler-Graham (Advisor)
Center for Interdisciplinary Research
St. Olaf College, Northfield, MN
- 53 **A NOVEL EX OVO CULTURING VESSEL DESIGNED FOR EXPERIMENTATION ON CHICKEN EMBRYO'S CHORIOALLANTOIC MEMBRANE**
Nicholas Ziebell, **Brooke Salo,** Hannah Pavek, Maddie Hentges, and Mary Ann Yang (Advisor)
Department of Biology
Concordia University, St. Paul, MN

Oral Presentations by Last Name

Adamson, Samuel	1:30, E2317	Reich, Brendan	1:00, E2315
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Emanuel, Elizabeth	1:45, E231	Schmidt, Connor	1:30, E2313
Jenkins, Dominick	1:15, E2317	Vang, Der	1:15, E2313
Landgreen, Emily	1:00, E2313	Wettschreck, Michael	1:00, E2317
Palen, Bethany	1:45, E2313	Ziebell, Nicholas	1:45, E2317
Pecoraro, Maria	2:00, E2315		

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Ecology & Environmental Science: Posters 40-47

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