MINNESOTA ACADEMY OF SCIENCE

83rd Annual Meeting &
29th Winchell Undergraduate
Research Symposium

University of Minnesota
Coffman Memorial Union
About the Annual Meeting & Winchell Undergraduate Research Symposium

The Annual Meeting & Winchell Undergraduate Research Symposium provides a forum for undergraduate students to present research in the sciences, 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 175 students, research advisors, members of MAS, faculty members, and other interested members of the community attend the symposium each year.

Judges

Anthony Baughn, University of Minnesota
Sian Durward-Akhurst, University of Minnesota
Elizabeth Fay, University of Minnesota
GW Gant Luxton, University of Minnesota
Shawn Goggins, University of Minnesota
Amanda Hayward, University of Minnesota
Zarah Karimian, University of Minnesota
Megan Kobiela, University of Minnesota
Joleen Khey, University of Minnesota
Lorene Lanier, University of Minnesota
Ishuan Li, Minnesota State University – Mankato
Debra Martin, St. Mary’s University
Gurdeep Marwarha, University of North Dakota
Terri Mattila, University of Northwestern

Roger Moon, University of Minnesota
Karl Peterson, University of Minnesota
Mark Rutherford, University of Minnesota
Kathleen Shea, St. Olaf College
Heather Sklenicka, Rochester Community & Technical College
Robert Simonson, Minnesota State University – Mankato
Morwena Solivio, University of Minnesota
Fernanda Shoyama, University of Minnesota
Robert Simonson, Minnesota State University – Mankato
Irina St. Louis, University of Minnesota
Aeisha Thomas, Crown College
Graeme Wyllie, Concordia College – Moorhead
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<td>Registration</td>
<td>Great Hall Annex</td>
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<td>1:15 p.m. – 2:45 p.m.</td>
<td>Poster Session B</td>
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<td>3:00 p.m. – 4:30 p.m.</td>
<td>Poster Session C</td>
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<td>Oral Presentation Session A</td>
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<tr>
<td>4:30 p.m. – 5:15 p.m.</td>
<td>Tours</td>
<td>Meet in Great Hall Annex</td>
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<td>Exploring Graduate School in the Life Sciences</td>
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<td>Navigation Post-Graduation Options in Industry</td>
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<td>5:30 p.m. – 6:00 p.m.</td>
<td>Oral Presentation Session B</td>
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<td>7:15 p.m. – 7:45 p.m.</td>
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Keynote Speaker

Dr. Julianna Abel is a Benjamin Mayhugh Assistant Professor in the Department of Mechanical Engineering at the University of Minnesota. Dr. Abel earned her Ph.D. and M.S. in Mechanical Engineering from the University of Michigan and her B.S. in Mechanical Engineering from the University of Cincinnati. During her undergraduate studies, she conducted research on high-temperature superconductors at the Air Force Research Laboratory at Wright-Patterson Air Force Base. Dr. Abel discovered her passion for smart materials and structures research during her graduate studies. Her current research interests lie in the model-based design of smart material technologies. Her research combines analytical modeling and experimental characterization to establish frameworks for the design and synthesis of smart material technologies for innovative robotic systems. The goal of her Design of Active Materials and Structures Laboratory is to develop technologies that enable new aerospace structures, medical devices, and consumer products.

Dr. Abel will be speaking about Active Textiles. Imagine a fabric that can move, sense, and harvest energy all in a single integrated multifunctional system. Soon, these multifunctional systems, may exist through the incorporation of smart materials into textile structures. Active Textiles have the potential to meet emerging needs for diverse engineering applications such as morphing aircraft, deployable space structures, biomedical and rehabilitative devices, robotic manipulators, and wearable technology. This presentation will discuss the design of Active Textiles including textile structures (e.g. knit, weave, and stitch) and smart materials (e.g. shape memory alloy, shape memory polymer, electro-active polymer, and piezoelectric). Additionally, details related to Active Knits, a specific Active Textile, will be presented. Active Knits are a promising example of Active Textiles that create complex, three-dimensional distributed actuation motions. The knit structure leverages the high energy density of a smart material, shape memory alloys (SMA) in this case, through a continuous network of loops called knit patterns. The knit patterns enable a variety of complex actuation motions including contraction, scrolling, coiling, arching, and accordioning that are not currently attainable. Not only do Active Knits provide complex motions, they deliver impressive performance, producing 10-600% actuation strain under moderate forces of 1 to 100 N. This research establishes the fundamental scientific understanding of the Active Knit actuation architecture to enable design, analysis, and synthesis of complex shape change actuators and discusses technological hurdles to realizing Active Textiles. The integration of smart materials into textile structures may enable advancements in current applications, as well as open the door to applications not yet imagined.
Workshops & Tours

Tours

**Nanofabrication Center:**  *Minnesota Nano Center, or MNC, is a state-of-the-art facility for interdisciplinary research in nanoscience and applied nanotechnology. The Center offers a comprehensive set of tools to help researchers develop. This is a guided tour.*

**MNDRive Robotics Center:**  *This guided tour will introduce you to the MnDRIVE initiative on robotics, sensors, and advanced manufacturing. This initiative envisions the University of Minnesota playing a vital role in bolstering Minnesota’s positions of leadership in sensors, robotics and automation, and as a contributor to the renaissance of domestic manufacturing, particularly additive manufacturing.*

**Minnesota Supercomputing Institute:**  *This guided tour will show how the MSI provides advanced research computing infrastructure and expertise to advance and accelerate research and foster innovation and discoveries.*

**Weismann Art Museum:**  *Guided tour of this Frank Gehry building, which was the forerunner to the famous Guggenheim Museum. The tour will include seeing the gallery and facility in its entirety.*

**Medical Device Center:**  *The MDC provides a unique environment with extensive prototyping equipment, staff and interface with the Minnesota Medical Center. You will also learn about the crown jewel of the center, the Innovation Fellows Program. This is a guided tour.*

Workshops

**ROOM 325: Exploring Graduate School in the Life Sciences - Hosted by the College of Biological Sciences:**  *Rebecca Dordel, CBS Career Coach will discuss what you should consider when making the decision to apply to graduate school, the components of a strong candidacy, and an overview of the application process.*

**ROOM 323: Navigation Post-Graduation Options in Industry - Hosted by the College of Science & Engineering:**  *Attend this panel to hear from a panel of recruiters representing local companies who hire across a variety of STEM degrees. The conversation will focus on common career options in industry and how to gain experience that will make you marketable in the field.*
CALL FOR PAPERS
Journal of the Minnesota Academy of Science

The Journal of the Minnesota Academy of Science (JMAS) is a peer-reviewed, open access academic journal featuring research from all disciplines. The journal has been published by the Minnesota Academy of Science since 1873 as part of its mission to recognize, influence, and promote excellence in science.

JMAS accepts original research in all areas of science, as well as review articles, cross-disciplinary reviews, and articles describing the teaching or mentoring of science at all levels in both academic and non-academic settings. Undergraduate students are invited to submit papers to JMAS.

Learn more or submit an article for consideration by visiting www.mnmas.org.
Awards

Awards are named after past presidents of the Minnesota Academy of Science who were leaders in their respective fields and exemplified the standard of excellence in science that the Minnesota Academy of Science seeks to recognize, influence, and promote. Longer descriptions of the presidents are available at www.mnmas.org.

**Thomas B. Magath Award for Excellence in Cellular And Molecular Biology**
Thomas B. Magath, President in 1934, worked in the Division of Experimental Surgery and Pathology at the Mayo Clinic and researched parasites.

**Lee I. Smith Award for Excellence in Chemistry**
Lee I. Smith, President in 1945, was a pioneering researcher in the field of organic chemistry. His crowning research achievement was the synthesis of Vitamin E, which led to his election as a member of the National Academy of Sciences.

**Newton H. Winchell Award for Excellence in Earth Science**
Newton H. Winchell, President in 1879, 1881, 1897, and 1898, was the first director and state geologist of the Geological and Natural History Survey of Minnesota. As part of his geological studies of northern Minnesota, Winchell uncovered the Mesabi and Vermilion iron ore ranges.

**Arthur N. Wilcox Award for Excellence in Ecology & Environmental Science**
Arthur N. Wilcox, President in 1950, was a driving force behind the founding of the Cedar Creek Ecosystem Science Reserve. The site is currently owned and operated by the University of Minnesota in cooperation with MAS.

**Thomas B. Walker Award for Excellence in Economics & Business**
Thomas B. Walker, President in 1903 and from 1906-1911, was a businessman and advocate for forest conservation who was one of the ten wealthiest men in the world in 1923. He was responsible for building the Minneapolis Public Library system and founded the Walker Art Center.

**Curtis D. Motchenbacher Award for Excellence in Engineering**
Curtis D. Motchenbacher, President in 1970, worked in the Defense Technical Information Center at Honeywell. Motchenbacher developed a small, lightweight meteorological sonde to measure index of refraction, temperature, humidity, pressure, and windspeed.

**Frank R. Verbrugge Award for Excellence in Math & Computer Science**
Frank R. Verbrugge, President in 1958, was the Interim Dean of the College of Science & Engineering at the University of Minnesota. Dr. Verbrugge helped establish state-wide higher education time-sharing and advocated for interactive computers and microcomputers in instructional labs.

**Edward J. Baldes Award for Excellence in Neuroscience**
Edward J. Baldes, President in 1956, was the head of the Biophysics Department at the Mayo Clinic. Dr. Baldes performed the first electroencephalogram (EEG) study at the Mayo Clinic.

**Hiram E. Essex Award for Excellence in Organismal & Physiological Sciences**
Hiram E. Essex, President in 1949, was also the 27th President of the American Physiological Society (APS). Dr. Essex’s physiological research dealt primarily with cardiovascular function and regional blood flow.

**Jay W. Buchta Award for Excellence in Physics**
Jay W. Buchta, President in 1940, was the chair of the Physics Department at the University of Minnesota. Dr. Buchta was responsible for bringing Frank Oppenheimer to Minnesota and was in correspondence with Richard Feynman and other physicists as the editor of The Physics Teacher.

**Stirling P. Stackhouse Award for Excellence in Social Science**
Stirling P. Stackhouse, President in 1975, worked at the Center for Transportation Studies at the University of Minnesota. Dr. Stackhouse’s research focused on human factors and traffic safety.

**Best in Session**
This award is given to the top oral presentation from across the conference. Number of awards given will be determined by the distribution of judges’ scores, but will range from 3-5.
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Adeel Ahmad¹, Gary M. Dunny (Advisor)², and Anne-Marie Leuck (Advisor)³  
¹University of Minnesota–Twin Cities, MN  
²Department of Microbiology, University of Minnesota, Minneapolis, MN  
³Department of Medicine, University of Minnesota, Minneapolis, MN

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Anna Folska and Lisa Prevette (Advisor)  
Department of Chemistry  
University of St Thomas, St. Paul, MN

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Carolyn Mickelson and Robin Fettig  
Department of Biology, Concordia College, Moorhead, MN

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Christopher Phenicie¹ and Russell Holmes² (Advisor),  
¹Department of Physics,  
²Department of Chemical Engineering and Materials Science,  
University of Minnesota–Twin Cities, MN

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Daniel Svedberg and Marija Cvetanovic (Advisor)  
College of Liberal Arts/Integrative Biology and Physiology  
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Dante Leyva Lundberg and James Kurle (Advisor)  
CFANS/Plant Pathology, University of Minnesota–Twin Cities, MN

MONARCH ABUNDANCE OVER AN URBAN GRADIENT  
Desirea Thole¹, Jessamine Finch²,³ (Advisor), and Joel Abraham⁴  
¹Minnesota State University Mankato  
²Chicago Botanic Garden Glencoe, IL  
³Northwestern University Evanston, IL  
⁴Yale New Haven, CT
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Evan Kalb and Thomas C. Marsh (Advisor)
Department of Chemistry University of St Thomas, St. Paul, MN

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Elizabeth Grein and Nathan Kuncel (Advisor)
Department of Psychology
University of Minnesota–Twin Cities, MN

BINDING AFFINITY OF PAH-COATED Au NANOPARTICLES TO GRAM-POSITIVE BACTERIAL CELL WALLS
Hannah Ganzel and Lisa E. Prevette (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

EXPLORING THE USE OF BACTERIAL TOXIN-ANTITOXIN SYSTEMS IN GENE THERAPY
Sarah Lucas and Mark J. Osborn (Advisor)
College of Biological Sciences
University of Minnesota–Twin Cities, MN

THE INFLUENCE OF UPPER-AIR WINDS AND THE El Niño-SOUTHERN OSCILLATION ON COMMERCIAL AIR TRAVEL
Jacob Arndt and Scott St. George (Advisor)
Department of Geography, Environment, and Society
University of Minnesota, Twin Cities, Minneapolis, MN

EFFECTS OF CAPTIVE-REARING ON THE COMMON HOUSE CRICKET, Acheta domesticus, AND ITS DIFFERENCES IN BEHAVIOR COMPARED WITH ITS WILD COUNTERPARTS
Xinci Tan and Marlene Zuk (Advisor)
Department of Ecology, Evolution, and Behavior
University of Minnesota–Twin Cities, MN

THE EFFECTS OF CLAY FILTERS ON ARSENIC LEVELS IN DRINKING WATER IN RURAL CAMBODIA
Jenny Koops and Jeff Port (Advisor)
Department of Biology
Bethel University, St. Paul, MN

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Department of Psychology
University of Wisconsin-Stout, Menomonie, WI

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Division of Science and Mathematics
University of Minnesota–Morris, Morris, MN

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Shelby Auger and James W. Wollack (Advisor)
Department of Chemistry
University of St. Catherine, St. Paul, MN

EVALUATING ONCOLYTIC ADENOVIRUS AND 5FU CHEMOTHERAPY COMBINATION TREATMENT FOR PANCREATIC CANCER
Jordan Sell and Julia Davydova (Advisor)
Department of Surgery
University of Minnesota, Twin Cities, MN

IRON CONTENT IN CONIFEROUS TREES: MESABI IRON RANGE VS. BEMIDJI
Nicole Limberis, Joseph Simonson, and Katie L. Peterson (Advisor)
Department of Chemistry
Bemidji State University, Bemidji, MN

COMPARING THE EFFECT OF DIFFERENT PEPTONE FORMULATIONS ON BACTERIAL GROWTH
Jennifer FitzGerald, Madeline Riemenschneider, Hailley Cound, and Thomas C. Marsh (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

USING IMMUNOHISTOCHEMISTRY TO DETERMINE IF FAM171B IS EXPRESSED IN THE BRAIN
Ka Xiong, Kayla R. Kermode, Natalie E. Klein, and Goeffrey M. Goellner (Advisor)
Department of Biological Sciences
Minnesota State University–Mankato, Mankato, MN

MicroRNAs AS POTENTIAL BIOMARKERS FOR PEDIATRIC EPILEPSIES
Bridget Curtin, Anne Sarver, Subbaya Subramanian, Sookyong Koh, and Reena V. Kartha (Advisor)
College of Biological Sciences
University of Minnesota–Twin Cities, MN

PRESCRIPTION ADHERENCE AMONG UNDERSERVED POPULATIONS
Horeja Jeng
College of Business/Finance
Minnesota State University–Mankato, Mankato, MN
EXPERIMENTAL EVOLUTION OF BACTERIAL MOTILITY
Michael Blazanin and Michael Travisano (Advisor)
College of Biological Sciences/Department of Ecology, Evolution, and Behavior
University of Minnesota–Twin Cities, MN

FROM GOLF COURSE TO PRAIRIE: INITIAL ASSESSMENT OF LOCAL MICROBIOMES IN RESTORATION AREAS
Vincent Anani and Sara Anderson (Advisor)
Department of Biosciences
Minnesota State University–Moorhead, MN

THE EFFECTS OF A MICROORGANISM STIMULANT AND COVER CROPS ON SOIL HEALTH, YIELD, AND PROFIT IN A STRIP-TILL CORNFIELD IN SOUTHEASTERN MINNESOTA
Kendra N. Klenz, Magill Schumm, Thomas A. Knee, and Kathleen L. Shea (Advisor)
Departments of Biology and Environmental Studies
St. Olaf College, Northfield, MN

GROWTH OF RARE EARTH AND TRANSITION METAL DOPED BaSnO$_3$ THIN FILMS VIA HIGH PRESSURE OXYGEN SPUTTER DEPOSITION
Sharacol E. Marcellino, Koustav Ganguly, and Chris Leighton (Professor)
Department: Chemical Engineering and Material Science
University of Minnesota–Twin Cities, MN

GLUTATHIONE S-TRANSFERASE EXPRESSION IN MICE (Mus musculus) EXPOSED in utero TO ATRAZINE
Megan Hafner and Debra Martin (Advisor)
Department of Biology
St. Mary's University of Minnesota

CANNABIS USE AND BRAIN VOLUMES: A CO-TWIN CONTROL ANALYSIS
Megan He, Sylia Wilson (Advisor), and William G. Iacono (Advisor)
Department of Psychology
University of Minnesota, Twin Cities, Minneapolis, MN

INVESTIGATION OF THE ENERGETIC PROPERTIES OF TOP DONOR CANDIDATES FOR ORGANIC SOLAR CELLS AND THE EFFECT OF NONPLANARITY ON THEIR ABSORPTION PROPERTIES
Megan Niblock and Rollin A. King (Advisor)
Department of Chemistry
Bethel University, St. Paul, MN

SYNTHESIS OF 6-CARBOXYHEXYL ACRYLATE AS A MODEL FOR LOW-COST SOLAR CELLS
Michael J. Strauss and Robert W. Kopitzke (Advisor)
Department of Chemistry
Winona State University, Winona, MN

PROPAGATING THE ENDANGERED SPECIES, Polemonium occidentale ssp. lacustre, FOR FUTURE RESTORATION
S0l Jin$^1$ and David Remucal$^2$ (Advisor)
$^1$Department of Mathematics and Science, Crown College, St. Bonifacius, MN
$^2$Curator of Endangered Plants, Minnesota Landscape Arboretum, Chanhassen, MN
91 (3:00pm)  TRANSPARENT, CONDUCTIVE AL-DOPED ZnO THIN FILMS VIA COLLOIDAL SYNTHESIS, ULTRASONIC SPRAY DEPOSITION, AND INTENSE PULSED LIGHT SINTERING
Michelle A. Smeaton, Bryce A. Williams, and Eray S. Aydil (Advisor)
Department of Chemical Engineering and Materials Science
University of Minnesota, Twin Cities, Minneapolis, MN

92  DEVELOPMENT OF A GENE DELETION STRATEGY IN Cellulophaga lytica
Morgan Petersen, Kelsey M. Singer, Brita L. Christenson, Emily N. Tellers, and Joanna R. Klein (Advisor)
Biology and Biochemistry
University of Northwestern, St. Paul, MN

93  FRUIT PREFERENCE OF EASTERN CHIPMUNKS (Tamias striatus)
Nicholas J. Randall and Pam Freeman (Advisor)
Biology Department
The College of Saint Scholastica, Duluth, MN

94 (1:15pm)  IDEAL RATIO OF PEG TO PAMAM DENDRIMER IN GENE DELIVERY
Stephanie Surma, Kyle Chamberlain, and Lisa Prevette (Advisor)
Department of Chemistry
University of St Thomas, St. Paul, MN

94 (3:00pm)  ANTI-MICROBIAL PROPERTIES OF PLANTS NATIVE TO THE PHILIPPINES AND TO MINNESOTA
Nick Thell, Bridget Pethke and Jeanne Minnerath (Advisor)
Department of Biology
St. Mary's University of Minnesota, Winona, MN

95  IDENTIFICATION OF PRIMERS OF PUTATIVE CARBOHYDRATE OXIDASE GENES FROM TOMATO
Paige Marsolek and Jennifer A. Maki (Advisor)
Department of Chemistry and the Physical Sciences
The College of St. Scholastica, Duluth, MN

96 (1:15pm)  THE EFFECTS OF ULTRAVIOLET RADIATION ON PHOTODEGRADATION OF SAGEBRUSH LITTER COLLECTED ALONG AN ELEVATION GRADIENT
Philip Fraley and Christopher Ruhland (Advisor)
Department of Biological Sciences
Minnesota State University, Mankato, MN

96 (3:00pm)  SOLID-STATE LIGAND EXCHANGE METHODS WITH CdSe/Cds QUANTUM DOTS TO OBTAIN UNIFORM COVERAGE
Kathryn Vlasic, Dana Dement, and Vivian Ferry (Advisor)
Department of Chemical Engineering and Materials Science,
University of Minnesota, Minneapolis, MN
97 (1:15pm)  SYNTHESIS OF DI-SUBSTITUTED BENZENE-ALKYNE ORGANIC LINKERS TO BE FUNCTIONALIZED WITH POM
Rachel L. Parupsky and Wade A. Neiwert (Advisor)
Department of Chemistry
Bethel University, St. Paul, MN

98 (1:15pm)  ISOLATION AND CLONING OF Trypanosoma brucei GENES INVOLVED IN LIPID DROPLET FUNCTION AND BIOGENESIS
Robin Fettig, Carly Mickelson, and John A. Flaspohler (Advisor)
Department of Biology
Concordia College, Moorhead, MN

99 (1:15pm)  SYNTHESIS OF MIXED-METAL METAL-ORGANIC FRAMEWORKS VIA ION EXCHANGE IN SOLUTION
Sammy Shaker and Andreas Stein (Advisor)
Department of Chemistry
University of Minnesota–Twin Cities, MN

100 (1:15pm) GC-MS DETERMINATION OF PHYTOSTEROL CONCENTRATIONS IN DRIED MUSHROOMS
Sumar Quint, Alix Overgard and Thomas W. Nalli (Advisor)
College of Science and Engineering
Winona State University, Winona, MN

100 (3:00pm) EFFECTS OF SULFATE AND SULFIDE ON THE LIFE CYCLE OF WILD RICE
Marissa Samuelson¹ and Nate Johnson² (Advisor)
¹Department of Mechanical Engineering
¹Century College, White Bear Lake, MN
²Department of Civil Engineering
²University of Minnesota Duluth, Duluth MN

101 (1:15pm) ANALYSIS OF PUTATIVE CARBOHYDRATE OXIDASE GENES FROM TOMATO
Tasha Engesser, Paige Marsolek, and Jennifer A. Maki (Advisor)
Department of Chemistry
The College of St. Scholastica, Duluth, MN

101 (3:00pm) OPTICAL CHARACTERIZATION OF COLLOIDAL SILICA GELS FOR ENCAPSULATION OF OXYGEN-PRODUCING CYANOBACTERIA
Benjamin Meyer and Alptekin Aksan (Advisor)
Department of Mechanical Engineering, University of Minnesota–Twin Cities, MN

102  GENETIC ENGINEERING AND EXPRESSION OF FUNCTIONAL FUSION PROTEIN SERVING AS BIOLOGICAL MODIFICATION ON SILICA NANOFIBERS FOR NEURAL TISSUE ENGINEERING
Amien Masroujeh¹, Anna Augustine¹, Samantha Brennan¹, Wen Shuo Chen², Yui-Whei Chen-Yang², and Mong-Lin Yang¹ (Advisor.)
¹Department of Science, Concordia University, St. Paul, MN
²Department of Chemistry, Center for Nanotechnology, Center for Biomedical Technology,
PREDOMINANCE OF DR3 IN SOMALI CHILDREN WITH TYPE 1 DIABETES IN THE TWIN CITIES, MINNESOTA
Zahra Mahamed and Muna Sunni (Advisor)
College of Biological Sciences
University of Minnesota–Twin Cities, MN

ANALYSIS OF X-RAY FLUORESCENCE SPECTROSCOPY ON FORT UNION GLASS TRADE BEADS
Hailey Karlovich¹, Kyle Springer¹, Nicole Grabow², and Deanna O’Donnell¹
¹Department of Chemistry, Hamline University, St. Paul, MN
²Midwest Art Conservation Center, Minneapolis, MN

EXTRACTION AND ANALYSIS OF Noturus gyrinus (TADPOLE MADTOM) DORSAL AND PECTORAL SPINE TOxin
Tyler Kline and Randy Krainock (Advisor)
Department of Biology
St. Mary's University of Minnesota, Winona, MN

TEMPERATURE'S EFFECTS ON THE LEGUME-RHIZOBIA SYMBIOSIS
Eric Holton, Amanda Gorton (Advisor) and Peter Tiffin (Advisor)
Department of Plant Biology
University of Minnesota, Twin Cities, MN

Pythium pleroticum AND Pythium minus, GROWTH-ENHANCING Pythium spp. INFECTING SOYBEANS
V. R. Brenk, J. E. Kurle, and G. Anderson (Advisor)
Department of Plant Pathology
University of Minnesota, Minneapolis, MN

SAR POLYMERIZATION AND HYDRATION OF POLY(OXY-1,4-PHENYLENEETHYNYL-1,4-PHENYLENE)
Keagan Anderson, and Dr. Thomas Nalli (Advisor)
Department of Chemistry
Winona State University, Winona, MN
Paper Presenters – By Last Name

Ahmed, Adee 3:00 PM Room 326  Kalb, Evan 3:45 PM Room 326
Ahn, Yeseul 5:30 PM Room 301  Kulik, Zoe 3:30 PM Room 324
Anderson, Matt 5:30 PM Room 302  Le, Giang 3:30 PM Room 319
Blazanin, Michael 5:30 PM Room 303  Masroujeh, Amien 5:45 PM Room 323
Buckbee, Jessica 5:30 PM Room 304  Ohlert, Tim 5:45 PM Room 303
Curtin, Bridget 5:45 PM Room 302  Pearson, Keenan 3:45 PM Room 319
Dhanju, Sundeep 5:30 PM Room 301  Pham, Theresa 4:00 PM Room 319
Dolabi, Alexander 3:00 PM Room 324  Phenicie, Chris 4:15 PM Room 319
Emerson, Dionte 5:30 PM Room 305  Riedeman, Nate 4:00 PM Room 326
Fanning, Sarah 3:15 PM Room 326  Sagarsky, Calandra 5:30 PM Room 301
Godfrey, Amber 3:00 PM Room 319  Singer, Kelsey 3:45 PM Room 324
Hafner, Megan 3:30 PM Room 326  Sorenson, Thomas 4:15 PM Room 326
Hani, Sophia 3:15 PM Room 319  Strom, Lucas 4:00 PM Room 324
He, Megan 3:15 PM Room 324  Thiel, Alexandra 4:15 PM Room 324
Holton, Eric 5:30 PM Room 323  Tuohy, Thomas 5:30 PM Room 319
Ippoliti, Francesca 5:45 PM Room 305  Walls, Levi 5:45 PM Room 319

Paper Presenters – By Presentation Room

**ROOM 301 – CELLULAR AND MOLECULAR BIOLOGY**
5:30 PM  RADIATION-INDUCED CHANGES IN CELF1 LOCALIZATION AND FUNCTION
Sundeep Dhanju, Calandra Sagarsky, Yeseul Ahn, and Irina St. Louis (Advisor)
Department of Biology, Society, and Environment
University of Minnesota–Twin Cities, MN

**ROOM 302 – CELLULAR AND MOLECULAR BIOLOGY**
5:30 PM  THE EFFECTS OF Bmp4 EXPRESSION ON LUNG DEVELOPMENT IN Xenopus EMBRYOS
Matt Anderson and Brian Hyatt (Advisor)
Department of Biological Sciences
Bethel University, St. Paul, MN

5:45 PM  MicroRNAs AS POTENTIAL BIOMARKERS FOR PEDIATRIC EPILEPSIES
Bridget Curtin, Anne Sarver, Subbaya Subramanian, Sookyong Koh, and Reena V. Kartha (Advisor)
College of Biological Sciences
University of Minnesota–Twin Cities, MN

**Room 303 – Ecology, Evolution, and Behavior**
5:30 PM  EXPERIMENTAL EVOLUTION OF BACTERIAL MOTILITY
Michael Blazanin and Michael Travisano (Advisor)
College of Biological Sciences/Department of Ecology, Evolution, and Behavior
University of Minnesota–Twin Cities, MN
5:45    ISLAND COLONIZATION DISTANCE AND SELF-COMPATIBLE REPRODUCTION IN PLANTS
       Timothy J. Ohlert and Emma E. Goldberg (Advisor)
       1Environmental Science, Policy, and Management/College of Food, Agricultural and Natural Resource
       Sciences
       2Department of Ecology, Evolution, and Behavior, University of Minnesota–Twin Cities

ROOM 304 – CELLULAR AND MOLECULAR BIOLOGY

5:30    TBX2 INHIBITS THE GROWTH OF THE MDA-MB-468 CELL LINE AND HAS NO EFFECT ON THE RESPONSE TO A HER2 NEUTRALIZING ANTIBODY
       Jessica Buckbee and Matthew Rowley (Advisor)
       Department of Biology
       St. Mary's University of Minnesota, Winona, MN

ROOM 305 – CHEMISTRY

5:30    AROMA MOLECULES AND SECONDARY EXPERIMENTATION
       Dionte Emerson and Heather Sklenicka (Advisor)
       Department of Chemistry
       Rochester Community and Technical College, Rochester, MN

5:45    SYNTHESIS AND CHARACTERIZATION OF THREE OLEOYL-PEG ORTHOESTER MICELLES FOR DRUG DELIVERY
       Francesca Ippoliti and Lisa Prevette (Advisor)
       Department of Chemistry
       University of St. Thomas, St. Paul, MN

ROOM 319 – CHEMISTRY, PHYSICS

3:00    DETERMINING THE BENEFITS OF ALTERNATIVE HAIRCARE CONDITIONING PRACTICES
       Amber Godfrey, Darren A. Miller II and Heather Sklenicka (Advisor)
       Department of Chemistry,
       Rochester Community and Technical College, Rochester, MN

3:15    METHOD DEVELOPMENT FOR THE IDENTIFICATION AND ISOLATION OF SECONDARY METABOLITES IN FUSARIUM SP. S7-4, DNA 38-P
       Sophia Hani and Annalisa Jordan (Advisor)
       Department of Chemistry and Biochemistry
       St. Catherine University, St. Paul, MN

3:30    POLYCATION VOLTAMMETRIC SENSOR FOR WATER REMEDIATION
       Giang Le, Phil Buhlmann (Advisor) and Xue Zhen. (Advisor)
       Department of Chemistry
       University of Minnesota—Twin Cities, MN

3:45    SYMMETRICALLY SUBSTITUTED BUILDING BLOCKS FOR THE PREPARATION OF HYBRID ORGANIC-POLYOXOMETALATE-BASED FRAMEWORKS
       Keenan Pearson and Wade A. Neiwert (Advisor)
       Department of Chemistry
       Bethel University, St. Paul, MN
4:00  ROUTES TOWARD LANTHANUM(III) TRIAZOLYLIDENE COMPLEX
PM    Theresa N. Pham¹, Dan Kremer¹, Marites A. Guino-o¹ (Advisor), and Daron E. Janzen²
¹University of St Thomas, St. Paul, MN
²University of St. Catherine, St. Paul, MN

4:15  ENGINEERING THE SHAPE OF SMALL MOLECULE ORGANIC SEMICONDUCTOR CRYSTALS
PM    Christopher Phenicie¹ and Russell Holmes² (Advisor),
¹Department of Physics,
²Department of Chemical Engineering and Materials Science, University of Minnesota–Twin Cities, MN

5:30  NOVEL SYNTHESIS OF A TETRASUBSTITUTED FURAN MOLECULE
PM    Thomas Tuohy, Andy Peterson, Michael Sirianni, Courtney Pahl, Andrew Kuelbs, and J. Thomas Ippoliti (Advisor)
Department of Chemistry
University of St. Thomas, St. Paul, MN

5:45  A LOOK AT A PURELY MINERALOGICAL DEPENDENCE ON WAVE SPEEDS IN HOMESTAKE MINE
PM    Levi Walls and Vuk Mandic (Advisor)
School of Physics and Astronomy
University of Minnesota, Minneapolis, MN

ROOM 323 – NEUROSCIENCE & CHEMISTRY

5:30  TEMPERATURE’S EFFECTS ON THE LEGUME-RHIZOBIA SYMBIOSIS
PM    Eric Holton, Amanda Gorton (Advisor) and Peter Tiffin (Advisor)
Department of Plant Biology
University of Minnesota, Twin Cities, MN

5:45  GENETIC ENGINEERING AND EXPRESSION OF FUNCTIONAL FUSION PROTEIN SERVING AS BIOLOGICAL MODIFICATION ON SILICA NANOFIBERS FOR NEURAL TISSUE ENGINEERING
PM    Amien Masroujeh¹, Anna Augustine¹, Samantha Brennan¹, Wen Shuo Chen², Yui-Whei Chen-Yang², and Mong-Lin Yang¹ (Advisor)
¹Department of Science, Concordia University, St. Paul, MN
²Department of Chemistry, Center for Nanotechnology, Center for Biomedical Technology, Chung Yuan Christian University, Chung Li, Taiwan 32023, Republic of China
ROOM 324 – GEOLOGY, SOCIAL SCIENCE, NATURAL SCIENCES, COMPUTER SCIENCE, & BIOLOGY

3:00 PM DEEP TIME AND VALUE: THE IMPOSSIBILITY OF LOCATING THE ORIGIN OF THE ANTHROPOCENE
Alexander Dolabi and Karl R. Wirth (Advisor)
Department of Geology, Macalester College, St. Paul, MN

3:15 PM CANNABIS USE AND BRAIN VOLUMES: A CO-TWIN CONTROL ANALYSIS
Megan He, Sylia Wilson (Advisor), and William G. Iacono (Advisor)
Department of Psychology
University of Minnesota, Twin Cities, Minneapolis, MN

3:30 PM COMPARATIVE BONE HISTOLOGICAL ANALYSIS: TESTING A “TITANOSAUR GROWTH PATTERN” IN Rapetosaurus krausei
Zoe Kulik and Kristi Curry Rogers (Advisor)
Department of Geology
Macalester College, St. Paul, MN

3:45 PM ANNOTATION AND CLONING OF A HYPOTHETICAL CELLULASE GENE IN Cellulophaga lytica
Kelsey M. Singer and Joanna R. Klein (Advisor)
College of Behavior & Natural Sciences
University of Northwestern, St. Paul, MN

4:00 PM EVALUATION OF SYNTACTIC PARSERS ON MEDICAL LANGUAGE
Lucas M Strom¹ and Serguei V. S. Pakhomov² (Advisor)
¹ Institute of Linguistics, Department of Computer Science,
University of Minnesota-Twin Cities, MN
² College of Pharmacy,
University of Minnesota-Twin Cities, MN

4:15 PM THE EFFECT OF TBX2 AND EPIREGULIN ON SIGNAL TRANSDUCTION PATHWAYS IN THE MCF10A HUMAN BREAST EPITHELIAL CELL LINE
Alexandra Thiel and Matthew Rowley (Advisor)
Department of Biology
St. Mary’s University of Minnesota, Winona, MN
<table>
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<th>Time</th>
<th>Title</th>
<th>Authors &amp; Advisors</th>
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| 3:00PM| DISRUPTION OF *Enterococcus faecalis* BIOFILMS ON VENTRICULAR ASSIST DEVICE DRIVELINES | Adeel Ahmad¹, Gary M. Dunny (Advisor)², and Anne-Marie Leuck (Advisor)³  
¹University of Minnesota–Twin Cities, MN  
²Department of Microbiology, University of Minnesota, Minneapolis, MN  
³Department of Medicine, University of Minnesota, Minneapolis, MN |
| 3:15PM| THE TENDENCY OF 17 α-ETHINYLESTRADIOL (EE2) TO BIOACCUMULATE IN TWO BENTHIC FISH SPECIES | Sarah Fanning and Joshua J. Lallaman (Advisor)  
Department of Biology  
St. Mary's University of Minnesota, Winona, MN |
| 3:30PM| GLUTATHIONE S-TRANSFERASE EXPRESSION IN MICE (*Mus musculus*) EXPOSED in utero TO ATRAZINE | Megan Hafner and Debra Martin (Advisor)  
Department of Biology  
St. Mary's University of Minnesota |
| 3:45PM| STUDY OF FLUORESCENT LIGAND INTERACTIONS ON SUPRAMOLECULAR G-DNA | Evan Kalb and Thomas C. Marsh (Advisor)  
Department of Chemistry  
University of St Thomas, St. Paul, MN |
| 4:00PM| EXAMINATION OF THE EFFECTS OF Xer81 ON NEURAL TUBE CLOSURE IN *Xenopus laevis* | Nate Riedeman and Brian Hyatt (Advisor)  
Department of Biology  
Bethel University, St. Paul, MN |
| 4:15PM| DETERMINING THE IMPORTANCE OF ENVIRONMENT FOR ESTABLISHING INTESTINAL MICROBIAL DIVERSITY | Thomas J. Sorenson and Federico E. Rey (Advisor)  
Department of Bacteriology  
University of Wisconsin–Madison, Madison, WI |