Discovering Your Pathway to Excellence

ACADEMIC BUILDING

THURSDAY, APRIL 20, 2017

The theme for this year’s Celebration of Scholarship, Discovering Your Pathway to Excellence, reflects an ongoing opportunity for members of the Lewis University community to search for the intersection of meaning and purpose with their academic pursuits.
PLENARY SESSION
Sancta Alberta
05 U.S. Representative Bill Foster [D-IL]
11th Congressional District ............................................................................. 11 AM-NOON

CONCURRENT SESSIONS
Academic Building
06 Session I .............................................................................................................. 1-1:45 PM
07 Session II ............................................................................................................. 2-3 PM
08 Session III .......................................................................................................... 3:15-4:15 PM
09 Session IV ........................................................................................................... 4:30-5:30 PM

CREATIVE WORKS
Academic Building (Adjacent to Concurrent Sessions)
10 Exhibits .................................................................................................................. Noon-5:30 PM
10 Presentations ......................................................................................................... 2-3 PM

POSTERS
Math and Computer Science Wing of the Academic Building and Science Center
(Posters on display from Noon-5:30 PM)
11 Session A .............................................................................................................. 2-3 PM
15 Session B .............................................................................................................. 3:15-4:15 PM
19 Session C .............................................................................................................. 4:30-5:30 PM

BUSINESS PLANS
Academic Building
24 Session A .............................................................................................................. 2-3 PM
25 Session B .............................................................................................................. 3:15-4:15 PM

PRESENTERS LIST
26

RELATED EVENTS
28
Lewis University is proud to sponsor the Sixth Annual Celebration of Scholarship. Providing an opportunity for the University to showcase the scholarly and artistic work of its graduate students, undergraduate students, and faculty, this annual scholarly event is co-sponsored by the Culture of Inquiry Advisory Committee; the University Office of Graduate Studies; the Colonel Stephen W. and Lyla Doherty Center for Aviation and Health Research; the Lowell Stahl Center for Entrepreneurship and Real Estate Studies; the History Center: Urban, Cultural and Catholic History of the Upper Midwest; the Center for Ministry and Spirituality; the University Faculty Development Committee; and the Scholars Academy.

The theme for this year’s Celebration of Scholarship, Discovering Your Pathway to Excellence, reflects an ongoing opportunity for members of the Lewis University community to search for the intersection of meaning and purpose with their academic pursuits. Through concurrent, poster, creative works and business plan presentations, students and faculty from across the University will have the opportunity to share their scholarship, celebrate a milestone in their academic experience, and consider paths that remain to be explored.

The Lewis University Celebration of Scholarship will present scholarly work in the following formats throughout the afternoon.

**CONCURRENT SESSIONS**
Students and faculty will give a 15-minute presentation on a research topic or paper they have written. Concurrent sessions will be scheduled in rooms in the Academic Building from 1-5:30 PM. Registration for presenters and information regarding the various Celebration of Scholarship events will be available throughout the day in the hall between the Academic and Science Building.

**POSTER SESSIONS**
Research posters will feature the results of research projects, internships and class presentations. Posters will be displayed in the Mathematics and Computer Science Wing of the Academic Building and Science Center from Noon-5:30 PM with the authors present at times as designated in this program.

**CREATIVE WORKS**
These include any piece that has been written, published or produced in a fine arts field, including music, art, theatre, literary reading, poetry, etc. These exhibits will be displayed from Noon-5:30 PM, with presenters available from 2-3 PM in the Academic Building adjacent to the concurrent sessions.

**BUSINESS PLAN COMPETITION**
The annual Lewis University Business Plan Competition, hosted by the Lowell Stahl Center for Entrepreneurship and the College of Business, encourages entrepreneurship among students throughout the Lewis community. The College of Business recognizes that potentially successful business ideas can come from a wide range of disciplines and may originate from an individual or a group of individuals. These presentations are scheduled from 2-4:15 PM in the Academic Building.
Dear Colleagues:

It is my privilege to welcome everyone to the sixth Annual Celebration of Scholarship. I am pleased to be a part of this important Celebration that recognizes the scholarly accomplishments of the undergraduate and graduate students and faculty members of Lewis University. This year’s theme of *Discovering Your Pathway to Excellence* highlights the countless hours of work that have led to this display of creativity and mastery by our students and faculty.

Since my arrival in July, 2016, I have been excited to learn about the many ways faculty are mentoring students in research initiatives and creative works. Several of these important efforts will be highlighted during our Celebration of Scholarship that will include 31 concurrent sessions, 119 posters, 13 business competition presentations and a variety of creative works. The academic excellence of Lewis University will be the focus of this celebration.

The Plenary Session at 11 a.m. in the Sancta Alberta Chapel will feature Representative Bill Foster (D-IL) from the 11th Congressional District. We are privileged to have this scientist and businessman, who serves on the House Committee on Financial Services, and the Committee on Science, Space & Technology as our keynote speaker. Following his remarks there will be multiple sessions, posters, displays and presentations in the Academic Building and Math & Computer Science Wing of the Academic Building as well as other events throughout the evening.

This day is possible because of the commitment of many faculty and staff. Thank you to the Office of Graduate Studies, the Planning Committee, the subcommittees and the many volunteers who give their time to make this event a success. Thank you to the Chair of the committee, Dr. Sarah Powers, Assistant Professor in the Biology Department and Co-Chair, Dr. Erica Kwiatkowski-Egizio, Assistant Professor, Secondary, Middle & Foreign Language Program, College of Education.

Faculty and student research, scholarly pursuits and creative works are fundamental to the life of the University. It is with great pride we celebrate the work that has been done and with great hope we look to the future to see these efforts continued. Together and in association our Mission values permeate all we do now and in the future.

Enjoy this Celebration of Scholarship and blessings to all.

Sincerely,

David J. Livingston, Ph.D.
President
Dear Colleagues:

It is with great pride and enthusiasm that Lewis University once again sponsors the annual Celebration of Scholarship. Now in its sixth year, the Celebration of Scholarship highlights the scholarly accomplishments of our undergraduate students, graduate students and faculty. Lewis University is fortunate each year to be able to showcase to the community the many research initiatives and creative works happening on our campus. We are proud of the mentoring relationships that have formed and will continue to thrive between our faculty and students from these endeavors.

This year’s theme, Discovering Your Pathway to Excellence, reflects the ongoing opportunity for the Lewis University community to search for meaning and purpose with their academic pursuits. It is a fitting theme that parallels Lewis University’s commitment to academic excellence across the University.

We are honored this year to have as our Keynote Speaker, Representative William Foster (D-IL) from the 11th Congressional District. Representative Foster is a scientist and businessman, who also currently serves on the House Committee on Financial Services and the Committee on Science, Space & Technology. He has also been a strong supporter of student research at Lewis and in higher education.

We are also grateful for all those who have worked diligently to make this Celebration a reality and a success. Thank you to those who serve on the Celebration of Scholarship Coordinating Committee, various subcommittees and work as volunteers. A special thanks to Dr. Sarah Powers, Assistant Professor in the Biology Department who served as Chair this year and to Co-Chair, Dr. Erica Kwiatkowski-Egizio, Assistant Professor, Secondary, Middle & Foreign Language Program in the College of Education. Thanks also to Dr. Nan Yancey, Graduate Dean, who provides leadership and guidance to this annual event. Sue Sheldon, Secretary to the Graduate Dean, is to be commended for all she does to help make this event so successful.

Thank you to all who have contributed to the ongoing success and growth of this annual event. The spirit of association permeates this day and speaks to our commitment to our Mission values of knowledge, wisdom, justice and fidelity all toward our efforts to promote student learning.

Sincerely,

[Signature]

Dr. Stephany Schlachter
Provost
11 AM – NOON

SANCTA ALBERTA

Welcome
Dr. Nan Yancey, Dean of Graduate, Professional and Continuing Education

Remarks
Dr. David Livingston, President, Lewis University

Introduction of Keynote
Dr. Sarah Powers, Assistant Professor of Biology; Chair, 2017 Celebration of Scholarship

Keynote Address
U.S. Representative Bill Foster [D-IL], 11th Congressional District

Audience Questions
Facilitated by Dr. Powers

Closing Remarks
Dr. Stephany Schlachter, Provost, Lewis University
Congressman Bill Foster is a scientist and businessman representing the 11th Congressional District of Illinois. He previously served from March 2008 until January 2011 as the Representative of the Illinois 14th Congressional District. Foster is the only physicist in Congress.

Foster serves on the House Committee on Financial Services, a position he also held in the 110th and 111th Congress, and the Committee on Science, Space, and Technology. Foster participated in the creation of several important reforms in the financial services and housing sectors, most notably the Dodd-Frank Wall Street Reform and Consumer Protection Act. Serving on the committee will provide Foster with an opportunity to ensure the effective implementation of these reforms, and to advocate for the needs of his constituents as the committee considers additional financial service and housing related proposals.

Congressman Foster’s business career began at age 19 when he and his younger brother co-founded Electronic Theatre Controls, Inc., a company that now manufactures over half of the theater lighting equipment in the United States.

His scientific career was as a high-energy physicist and particle accelerator designer at Fermi National Accelerator Laboratory (Fermilab). He was a member of the team that discovered the top quark, the heaviest known form of matter. He also led the teams that designed and built several scientific facilities and detectors still in use today, including the Recycler Ring, the latest of Fermilab’s giant particle accelerators. When he first ran for Congress, his campaign was endorsed by 31 Nobel Prize Winners.

Foster lives in Naperville with his wife Aesook, who is also a physicist. He has two grown children, Billy and Christine. His father was a civil rights lawyer who wrote much of the enforcement language behind the Civil Rights Act of 1964.
CONCURRENT SESSIONS

(See Presenters Index on Pages 26-27)

SESSION I

1-1:45 PM

**AS-150-A**

**Moderator:** Dr. Suling Li

**Developing a History of Fairmont, Illinois: Oral History as a Bridge to the Past**

*Undergraduate Student Project in Humanities*

*Troy Costabile & Jared Domenico*

Dr. Dennis Cremin

Students will present research on the history of Fairmont, Ill. Students used qualitative research methods, including oral histories. They considered, in part, the African American experience in the context of urban and rural settlement patterns.

**AS-155-A**

**Moderator:** Dr. Mark Letcher

**The Media and Mental Illness**

*Undergraduate Student Project in Social Sciences*

*Breandan Rook*

Dr. David Anderson

The paper will look at the media’s portrayal of mental illness from television, movies, and radio. It will also call attention to what the media has done wrong, as well as what they have done right.

**AS-156-A**

**Moderator:** Dr. Gwen Svoboda

**The Treatment of Individuals with Disabilities Throughout History**

*Undergraduate Student Project in Social Sciences*

*Tara Cochran & Taylor Cochran*

Dr. James Tallon

This presentation will examine how the mindsets and ideologies of institutions and society have changed over the last thirty to forty years toward individuals with disabilities, and what caused these changes.

**AS-157-A**

**Moderator:** Dr. John Parker

**Precision Beam Timing Monitor**

*Undergraduate Student Project in Math & Science*

*Zachary Arcara & Jackson Waters*

Dr. Ryan Hooper

The particle beam technology known as the precision beam timing monitor will be discussed including its purpose, set-up, and results from 2016 along with current data. The results will be compared to that of standard devices being used currently. New data analysis techniques will also be discussed to show improvements from past results.

TV Police Portrayal

*Undergraduate Student Project in Humanities*

*John Morrison*

Dr. David Anderson

TV Police Portrayal researched portrayals of law enforcement officers in movies and television and how they reflect real world data on the police. Our media samples included eight current Nielsen-rated television shows and eight recent major motion pictures, all with subject matter regarding law enforcement. We found that media portrayals of police and victims are generally accurate to real world crime statistics. The research was conducted for a Mass Media Ethics course by Olivia Ward, Alex Calderon and John Morrison.
AS-158-A
Moderator: Dr. Mallory Havens

Inhibiting the Growth of Microorganisms on Contact Lenses through a Novel Extended-Wear Lens Design
Undergraduate Student Project in Math & Science
Courtney Dial

Dr. Jason Keleher

Millions of people around the world wear contact lenses. However most of them do not clean them properly, which can lead to serious eye infections. Through investigation it was found that microorganisms grow biofilms on extensively used contact lenses, which is what presumably causes infections. Therefore, a new lens was designed in order to deter biofilm formation. This novel construction was accomplished by imbedding gold nanoparticles, which have natural antimicrobial abilities, into the lens.

Preventing Amyloid-ß Peptide Aggregation in Alzheimer’s Patients
Undergraduate Student Project in Math & Science
Emily Vihnanek

Dr. Daniel Kisseb

AD is an irreversible, disease that is incurable. However, the inhibition of Aß peptide aggregation can be used to slow down or even stop the progression of cell death in the brain. The use of a therapeutic ligand binding to Cu2+ on Aß42 may decrease the aggregation of the peptide and stop the progression of cell death in AD patients.

AS-150-A
Moderator: Dr. Laura McDonald

Moving from Athlete to Coach: The Transition Experience
Undergraduate Student Project in Social Sciences
Skyler Zak

Dr. Edmund Kearney

The transition from athlete to coach can be a challenging one. This study examines that transition experience, highlighting emotions as well as helpful and challenging experiences as identified by head coaches, assistant coaches, and graduate assistant coaches. Over 150 coaches from the GLVC conference were surveyed for their experiences. Implications for athletes moving into coaching roles will be discussed.

Respecting the Human Body in Criminal Investigation: A Travel Study Experience
Faculty Project in Social Sciences
Drs. Cynthia Misischia & Lynn Tovar

This presentation will include the process of offering a successful travel study for undergraduate students in three different degree programs: forensic criminal investigation, criminal/social justice and biology. Drs. Misishia and Tovar will talk about their students’ experiences at the University of Tennessee’s Forensic Anthropology Center (aka the Body Farm) in May 2016. As a result of the travel study, several of the students changed career paths and are now seeking master’s degrees in forensic anthropology.

AS-155-A
Moderator: Dr. Mardy Philippian

Let Your Life Speak: Connecting the Personal with Public Advocacy
Undergraduate Student Project in Humanities
Andrea Holm, Steven Seum, Ashley Stajura, Ashley Zizich & Keanu Taylor

Dr. Sheila Kennedy

This presentation features students’ memoirs/life stories exploring the ways in which their lived experiences call them to advocate with and for particular social justice issues, community needs, and community organizations.

Ready Set Ride: Creating Professional Documents to Show the Power of Writing & Collaboration
Undergraduate Student Project in Humanities
Samantha Gennett, Andrea Holm, Amanda Gieseler & Bree Scott

Dr. Jennifer Consilio

Professional Writing students engaged with their community by partnering with local organization, Ready Set Ride, a horse-therapy nonprofit, and offered recommendations on how to improve their outreach through their online presence. The students then followed through with their recommendations and designed documents, such as PR materials, a rewritten mission statement and created a YouTube channel, to reach all potential audiences of RSR. The service-learning course taught the students skills in design, writing, communication and collaboration.

Signing the Future of Sign Language
Undergraduate Student Project in Math & Science
David Gagnon

Dr. Lucien Ngalamou Pideu

American Sign Language (ASL) is commonly said to be ‘the fourth most-used language in the United States.’ However, many of these people are hearing impaired and thus they have a hard time speaking to those who do not know ASL. Our goal is to create gloves that can monitor the shape of the user’s hands and interpret it into letters of the ASL language, so that these two groups can more easily communicate.

Altered eIF4H Expression Changes Cellular Growth Rates
Undergraduate Student Project in Math & Science
Doherty Center for Aviation and Health Research
Abigail Bieker & Elizabeth Przekwas

Dr. Mallory Havens

eIF4H is a gene that is shown to contribute to the metastasis of cells in lung and colon cancer. We altered the ratio of two eIF4H

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isoforms, one containing exon 5 and one excluding exon 5, in cancerous and non-cancerous cell lines to determine if the cells were affected. We have specifically looked at changes in growth rate and are now studying the effect of exon 5 on cell migration and invasion, additional properties of cancer.

**Healthcare Informatics Management: A Machine Learning Approach for Cancer Diagnosis**

*Faculty Project in Business*

**Dr. Ibrahim Mescioglu**

Results of a novel machine learning algorithm for diagnosis of head and neck cancer tumors are presented.

**AS-158-A**

*Moderator: Dr. Randal DeMik*

**The Use of Omega-3 Fatty Acids to Treat Rheumatoid Arthritis**

*Undergraduate Student Project in Math & Science*

**Martha Navarro**

Dr. Jennifer Roberts

Rheumatoid arthritis is a chronic inflammatory autoimmune disease that affects multiple joints in the body. This presentation will focus on how dietary intake and supplementation of omega-3 fatty acids can be used as an alternative or enhancement of current treatments.

**Dietary Supplementation and Nutrition as Alternative Augmentation Therapies for Multiple Sclerosis**

*Undergraduate Student Project in Math & Science*

**Kaley McLawhorn**

Dr. Erin Zimmer

Multiple Sclerosis, or MS, is the most common chronic disabling disease of the central nervous system. However, there is no cure for the disease and the cause of MS is still unknown. Safe and effective therapies need to be explored to not only reduce patients’ MS symptoms, but to also improve their overall quality of life. One of the safest ways to achieve this is through dietary supplementation and sufficient nutrition.

**SESSION III**

**3:15-4:15 PM**

**AS-155-A**

*Moderator: Dr. Ibrahim Mescioglu*

**NBA Expansion**

*Undergraduate Student Project in Business*

**Matt Maza & Bill Mrowczynski**

Zachary Binkley

Research was conducted to demonstrate what new markets would be the best fit for an NBA team. The presentation features data and analytics to determine what markets would be the best fit for NBA Expansion/ Relocation for a team. Presentation of the research findings will illustrate which markets are the best fit.

**An Analysis of the Yuan’s Future as a Global Currency**

*Graduate Student Project in Business*

**Penluck Sriboonruang & Eakapon Sangchot**

Dr. Frank S. Rose

This research examines the future role of the yuan in global commerce. The IMF’s decision to include the yuan in the Special Drawing Right (SDR) in 2015 recognizes the growing importance of the currency. This work analyzes the prospects for continued expansion in the yuan’s use, and what this means for China’s economic growth and the country’s role in the global economy.

**AS-156-A**

*Moderator: Dr. Christopher Palmi*

**“I Am Off to the Fire Filled with Courage and Enthusiasm”: German American Soldiers in the Civil War**

*Undergraduate Student Project in Social Sciences*

**Richard Maska**

Dr. James Tallon

Research paper on German soldiers who served in the Civil War.
Canal Diggers-Church Builders: Irish Canal Workers and the Founding of Roman Catholic Parishes
Faculty Project in Humanities
Eileen McMahon
Irish canal workers build first parishes along the I&M Canal route.

AS-157-A
Moderator: Dr. James Houlihan
Self-help as a Positive Psychology Intervention for Depression
Undergraduate Student Project in Math & Science
Rebecca Klaff
Dr. Mary Vandendorpe
Evidence reveals that self-help interventions are an effective supplement to existing methods of treatment for depression. These interventions are easily distributed and help reduce issues regarding accessibility and cost of treatment for people displaying mild to moderate depressive symptoms. Presented is a summary of findings from a literature review of existing trials aimed at determining the acceptability of using self-help interventions.

Vicarious Trauma: Portrait of Domestic Violence Victim Advocates
Faculty Project in Social Sciences
Dr. Lynn Tovar
This IRB-approved qualitative research study will discuss theories involving helping professionals who work with domestic violence victims. The preliminary data analysis from interviews conducted with domestic violence advocates will address symptoms of vicarious trauma and coping mechanisms.

SESSION IV
4:30-5:30 PM

AS-155-A
Moderator: Dr. Andrea Krieg
Crisis Interventions in the Aftermath of Rampage Shootings
Graduate Student Project in Social Sciences
Amanda Noe
Emily Petkus
This presentation explores the aftermath of school shootings, and how media coverage re-traumatizes survivors of these tragedies. Further, this presentation explores research into the best crisis intervention strategies to help alleviate PTSD symptoms following these incidents.

Effects of Media’s Hyper-Sexualization of Female Bodies and Portrayal of the Western Standard of Beauty Ideals on African American Feminine Self-Conception
Graduate Student Project in Social Sciences
Ceirstan Quarles
Dr. Christopher Palmi
Research proposal, completed in the fall of 2015, looks at the effects of media, western beauty ideals, and hyper-sexualization on women, particularly African American women.

AS-156-A
Moderator: R. Eric Jones
International Collaboration: The Need for ICAO’s Global Market-Based Measure for Aviation
Graduate Student Project in Math & Science
Josephine Herrera-Rivera
Erik Baker
The research and analysis completed within this paper proposed a legal analysis to support the environmental framework of ICAO’s Global Market-Based Measure (GMBM). This paper contends that ICAO is to be the primary means to define and maintain the environmental standard for the international aviation community.

Live Demonstration of Projected Reality Technology Using an Unmanned Aircraft Systems (UAS) and Ground-Based Sensors to Enhance Rea
Graduate Student Project in Math & Science
Eric Swanson, Robert Landers & Adam Abbasi
Erik Baker
Presenters will provide a live demonstration of augmented reality technologies for emergency services and discuss lessons learned in the integration of datasets from a variety of unmanned aircraft and ground-based sensor arrays.
Disorientation
Undergraduate Student Project in Visual Arts
Larissa Barnat
Dr. Mark Swain
Art and design are the center of my life. As an artist, passion and self-improvement are my motivation. I strive to create art that engages others with matters beyond what is immediately visible. My chrome oil painting series titled 'Disorientation' shows dreamy scenes of blended portraits and abstraction to evoke emotion and confusion. My series serves purpose as a consistent collection that complements each other.

Poison: The Silent Killer
Undergraduate Student Project in Math & Science
Kelly Green & Jessica Thornton
Dr. Cynthia Misischia
This presentation is about Hemolock poisoning and its effects on the body. By the end of the presentation, you will be informed about this type of poisoning to be able to identify it and know its effects.
SESSION A
2-3 PM

1 Economics of Political Revolutions
Undergraduate Student Project in Humanities
Mary Huggins
Dr. Steven Nawara
The research looks at the different economic factors that can influence the overthrow of governments, specifically debt levels, GNP, and employment rates. Social factors like the type of government and the stability of the nation are also examined.

4 Chinese Derivative Contracts: Successes or Failures?
Undergraduate Student Project in Business
Mackenzie Fuller
Dr. Frank Rose
This research will examine the success and failure of products offered for trading at the four derivatives markets in China.

7 To Tell or Not to Tell: Child Recantation and the Victim-Perpetrator Relationship
Undergraduate Student Project in Social Sciences
Laurel Harnett
Dr. Andrea Krieg
This research topic will reflect a social concern of child sexual abuse and a child victim’s likelihood of recanting an allegation of abuse dependent upon the victim's relationship to the perpetrator. Importantly, with this knowledge, child advocating service providers, law enforcement, and legal professionals can not only better anticipate recantation, but also, potentially prevent it by accordingly tailoring methods of assistance to better solicit consistent disclosures of sexual abuse.

10 Understanding Postpartum Hemorrhage
Undergraduate Student Project in Nursing
Caitlyn Greminger
Theresa Welsch
This scholarly project is concerned with identifying, treating, and preventing this condition as well as explaining the pathophysiology of postpartum hemorrhage. Healthcare providers and nurses should monitor the patient closely and perform the appropriate assessments at regular intervals to reduce the occurrence of postpartum hemorrhage.

13 Co-infection of Onchocerciasis and Loiasis: An Alternative Therapeutic Approach
Undergraduate Student Project in Math & Science
Jessica King
Dr. Mallory Havens
Human onchocerciasis, also known as river blindness, is the second leading infectious cause of blindness in the world. The parasites that cause onchocerciasis and loiasis are co-endemic, making treatment of individuals co-infected complicated. The recommended microfilaricidal drug, ivermectin, used for treating onchocerciasis, causes serious adverse events (SAE) in people with high L. loa microfilaraemia. Thus, alternative therapeutic approaches that eliminate the risk for SAE will be discussed.

16 Acceptance of Line Calling Technology in Tennis
Undergraduate Student Project in Math & Science
Andrea Jozefat
Zachary Binkley
The study evaluates members of the Lewis University tennis teams on their acceptance of technology within in-game officiating. Players participating in the study are asked if they are comfortable with using technology to improve the game and whether they would be accepting of new innovations that could possibly change the tradition and spirit of the game. The study uses a modified Technology Acceptance Model survey (TAM) to distinguish feelings of acceptance regarding technology-based line calling.

19 Social Media Marketing’s Effect on Brand Awareness and Success of Small Businesses
Undergraduate Student Project in Business
Alison Green
Dr. Shan Lin
This study analyzes the effects of social media marketing on the success of small businesses, and which strategies are the most effective.

22 The Effect of Angular Speed on Pitching Statistics in Major League Baseball
Undergraduate Student Project in Math & Science
Ryan Smith
Dr. Ryan Hooper
Data from MLB Statcast is analyzed to find correlations between angular speed and several pitching statistics.
25 Advancements in Upper Limb Prosthetics  
Undergraduate Student Project in Math & Science  
Molly McEvilly  
Dr. Jennifer Roberts  
This presentation will focus on the advancements in upper limb prosthetic use.

28 Michelson Interferometer Constructed with 3D Printed Components  
Undergraduate Student Project in Math & Science  
Giovanni Llinas Rosa  
Dr. Charles Crowder  
A Michelson Interferometer will be built with traditional metal parts. Then, some of the traditional metal parts will be replicated with a 3D printer to build a second Michelson Interferometer. Once both interferometers are built, a Red HeNe laser will be used to project a wave pattern on a white wall or surface. This pattern will be analyzed to determine the wavelength of the HeNe laser, and the results will be compared to the accepted wavelength. The results are expected to be within calculated uncertainties. If this is the case, this research can lead to making more optics components with the 3D printer because it is more cost-effective than buying metal components.

31 Analysis of Normal vs. Mutated Cyclin D3 Protein Structure Using Molecular Cloning and Site Directed Mutagenesis  
Undergraduate Student Project in Math & Science  
Daherty Center for Aviation and Health Research  
Courtney Dial & Michelle Fernandez  
Dr. Sarah Powers  
The cyclin D3 protein has been observed to correlate with many cancers at an interesting interface when mutated. Therefore, through molecular cloning and mutagenesis the idiosyncratic interface was studied. A DNA template with the appropriate sequence of DNA corresponding to the cyclin D3 protein was created through molecular cloning. Mutagenesis was then used to mutate the template DNA nine different ways, representing nine key mutations found at the interface previously mentioned.

34 Prevention of Fertilizer Run-Off through the Analysis and Characterization of Ammonium Nitrate  
Undergraduate Student Project in Math & Science  
John Hodul  
Dr. Jason Keleher  
This research looks at the prevention of fertilizer run-off through the characterization and analysis of different concentrations of fertilized topsoil water samples.

37 Evaluation of Illinois Pre-Licensure Nursing Education Programs, Students and Faculty from 2011-15: A Doctorate of Nursing Practice Residency Partnership  
Graduate Student Project in Nursing  
Stephanie Gedzyk-Nieman  
Dr. Gwen Svoboda  
Partnering with agencies during the Doctorate of Nursing Practice (DNP) program residency is a means of applying the knowledge and skills required for the degree to current healthcare needs. For this experience, a DNP student partnered with the Illinois Department of Financial and Professional Regulation and the Illinois Center for Nursing to assist in the first-time creation of a report for healthcare planners regarding trends in Illinois pre-licensure nursing education programs, faculty and students from 2011-2015.

40 Synthesis of Conductive Cellulose Nanocomposites for the Electrochemical Remediation of Metal Ion Containing Waste  
Undergraduate Student Project in Math & Science  
Joseph Lambert III  
Dr. Joseph Kozinski  
This research explored the modification of cellulose with APTES as a vehicle to increase the hydrogen bonding capacity prior to the incorporation of the conducting polymer polyaniline.

43 Eating Disorders and Substance-Use Disorders: The Overlooked Interrelatedness  
Undergraduate Student Project in Social Sciences  
Natalie Palm  
Dr. Katherine Helm  
This study examines behavioral and cognitive similarities of eating disorders, more specifically Bulimia Nervosa and Binge Eating Disorder, and substance use disorders. Predictive factors shared between eating disorders and substance use disorders are included as well. Additionally, suggestions for potential methods of combining treatment strategies are given.

46 Optimizing Gold Nanoparticle Synthesis for Laser Light Mitigation  
Undergraduate Student Project in Math & Science  
Carolyn Graverson & Allie Mikos  
Dr. Jason Keleher  
Commercial lasers have become problematic for the aviation industry as the intense light enters the cockpit, distracting pilots during critical phases of flight. Successful attempts to block green laser light have been accomplished using a composite coating of photo-responsive materials. This research introduced gold nanoparticles (GNP) into a polymeric composite coating to adsorb green laser light (532 nm).
**58** A Suboptimal Algorithm to TSP in Polynomial Time

*Undergraduate Student Project in Math & Science*

**Joseph Onesto**

Dr. Amanda Hasty Ramsay

The Traveling Salesman Problem (TSP) is described as follows: Given a set of points in space, find the smallest distance required to visit every point exactly once, while returning to the starting point. As well as logistics, TSP solutions can also be applied to the efficient manufacture of microchips as well as the optimization of DNA sequencing. Using a geometric approach, we explore a suboptimal algorithm that runs in polynomial time, faster than most algorithms.

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**67** Examining the Correlation Between Quasar Redshift and X-ray Emissions

*Undergraduate Student Project in Math & Science*

**Alexander Ziegenhorn**

Dr. Joseph Kozminski

This presentation will examine the relationship between redshift and x-ray spectra of quasars using data from the Sloan Digital Sky Survey (SDSS) and the Chandra X-ray Observatory (CXO). The data will be considered for cases of broad and narrow emission lines to further examine trends.

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**55** Design of a Remote Winch System to Provide for Independent Grain Entrapment Rescue

*Undergraduate Student Project in Math & Science*

**Markie Day**

Dr. Charles Crowder

Grain entrapment occurs when a worker enters a grain bin where unstable grain can collapse, burying and suffocating the worker within the grain. The goal of this research is to design and test equipment that will eliminate the reliance on rescue workers and shorten the 3.5 hour average rescue time. This device will utilize a 12-volt solar panel, 12-volt battery, and a remote-controlled utility winch operated by the victim. This system will ideally provide a significantly quicker rescue technique and decrease the high rate of death associated with these incidents.
AI News Filter
Undergraduate Student Project in Math & Science
Alexander Jonic & Connor Childs
Dr. Piotr Szczurek
With artificial intelligence gaining popularity among common applications, we decided to implement aspects of artificial intelligence into an application that filters newsfeeds based on learned user preferences.

Stock Prediction with Reinforcement Learning
Undergraduate Student Project in Math & Science
Mark Horeni, Marc Cerda & Brandon Joutras
Dr. Piotr Szczurek
Our research is on the applications of reinforcement learning in the stock market. The goal is to create a software intelligent agent which, given a set amount of money, must decide whether or not to buy, sell, or hold a stock. Our agent will utilize historical data to maximize its portfolio by trading one stock. The performance will be measured by comparing this approach to other approaches.

Teaching with Primary Sources
Undergraduate Student Project in Education
Katherine Rogala
Kathryn McSherry
When studying history, the best evidence one can use are primary sources. These are original items, artifacts, writings, drawings, photographs, records, interviews, speeches, and diaries from the era being studied. Using primary sources when teaching history enhances student learning by getting students more interested in the content while also making them well-rounded on the subject. Showing students original items from the period being discussed will allow them to better understand the significance of the subject and allow them to feel more connected to it as well.

Like a Girl
Undergraduate Student Project in Social Sciences
Paige Smith
Dr. Pramod Mishra
My abstract discusses the main points of my essay on gender equality. I used my own experiences, documentaries, multimedia books and social media as resources.

Preventing Hydroxyl Radical Formation in Alzheimer’s Disease
Undergraduate Student Project in Math & Science
Emily Vihnanek & Saniya Qadir
Dr. Daniel Kissel
Alzheimer’s Disease is caused by the aggregation of beta amyloid plaques that eventually, through Fenton chemistry, produces hydroxyl radicals in the brain. The amyloid beta peptide (Aβ) reacts with Cu2+, causing a reduction to Cu+. Cu+ reacts with oxygen to create reactive oxygen species (ROS), which not only causes Aβ peptide aggregation, but also forms hydroxyl radicals. Hydroxyl radicals are destructive to brain cells, as seen in Alzheimer’s patients. By entrapping the Cu+ on the Aβ peptide with a chelating agent, the ROS no longer have a binding site, which may prevent the formation of hydroxyl radicals.

Optimization of an Antimatter Beam Core Engine
Undergraduate Student Project in Math & Science
Matthew Dubiel
Dr. Ryan Hooper
The research focuses on the optimization of a simulated antimatter beam core engine. Antimatter completely converts mass to energy making it an exciting prospect to replace conventional fuel sources in high velocity vehicles.

Next Steps of Power Transfer
Undergraduate Student Project in Math & Science
Darrin Mayotte
Dr. Charles Crowder
A system will be fabricated to power a small electronic device through inductive coupling, which is an example of wireless power transfer. It should then be possible to power multiple devices, small rooms, and perhaps even larger environments. This may be the first step in revolutionizing not only the electronic industry but other fields of powered devices as well.
103 Latin Squares and Their Applications
Undergraduate Student Project in Math & Science
Elizabeth Geier
Dr. Amanda Harsy Ramsay
This project explores Euler’s conjecture and its impact in the math world. It will also relate the correlation between Latin squares and magic squares.

106 Characterization of Phenyl-Treated Silica Mesopores
Undergraduate Student Project in Math & Science
Mikayla Bertrand
Dr. John Parker
Silicate sol-gels contain mesopores and have applications in areas such as drug delivery, flavoring agents, and food dyes. Phenyl-treated zinc oxide nanoparticles integrated into and dissolved out of the gel leave behind the phenyl functionality in the pore. Dyes added to the gel help identify behavior and structure of the gel and the treated pores, which can be characterized through physical observation and FTIR spectroscopy.

109 Prediction Accuracy: Constructive Feedback Plays a Positive Role in Reducing Student Overconfidence
Undergraduate Student Project in Social Sciences
Eric Leong
Dr. Susan Sheffer
This study examined student overconfidence regarding exam preparation. Throughout the semester, students were asked to predict their exam scores prior to each exam. Prediction accuracy was operationally defined as the ‘predicted score’ minus the ‘actual score.’ The goal of this study was to help students improve their prediction accuracy and subsequently to improve their studying efficiency. Results showed that student prediction accuracy did tend to improve throughout the semester.

112 Photo-Electrochemical Water Splitting Using Functionalized Nanocomposite Anodic Materials
Undergraduate Student Project in Math & Science
Jordan Shanahan
Dr. Jason Keleher
Photo-electrochemical (PEC) water splitting is the solar powered electrochemical reaction of water to produce hydrogen gas, an alternative fuel source. This project studies the hydrogen production capabilities of a PEC water splitting cell encompassing a new dye-particle complex design for photoanodic material and compares efficiency to more standard systems.

115 Proposed NQF eMeasure for Traumatic Brain Injury
Faculty Project in Nursing
Eleftheria Karapas
Traumatic brain injury (TBI) is one of the leading causes of death and disability in the United States. The severity of the brain injuries varies greatly as do the specific long-term needs of these individuals. It is proposed that an ongoing screening of patients with a history of TBI be implemented, using a uniform set of assessment instruments to determine quality of life issues. By aggregating as an NQF eMeasure into a Meaningful Use data bank, gaps in care services could be identified. Not only could individual patient care coordination be improved, the collective TBI patient population could have better care options and outcomes of care in the future.

118 Characterization of 5CB Electro-optic Properties for Use in Aviation Safety
Undergraduate Student Project in Math & Science
David Santefort
Dr. Charles Crowder
The use of liquid crystals are explored as a means to decrease the threat of laser attacks on airplanes for greater aviation safety.

2 Mother Nature and Modern Science: Complementary or Contraindicated?
Undergraduate Student Project in Nursing
Brian Grossart
Dr. Donna Martin
This presentation will compare a current hospital policy with the most up-to-date research regarding appropriate medical intervention to slow or prevent pre-term labor. Effective policies must be clear, current, and easily remembered by health care providers to provide safe care during pre-term labor situations. But, when these policies fall short, what course of action is to be taken, and who bears the burden to do so?

5 Influence of Vibration Therapy on Rehabilitation Post-Anterior Cruciate Ligament Reconstruction
Undergraduate Student Project in Math & Science
Sarah Swientek
Dr. Laura McDonald
Evidence was obtained on generalized vibration therapy and can be applied to the PICO question, but does not directly answer the specifics of the question: For patients post-anterior cruciate ligament reconstruction, does the inclusion of vibration therapy to standard rehabilitation reduce time loss from activity? Literature review and critique of literature sections display research articles in which some are better than others for reasons such as applicability to question and type of study design. As a whole, it shows that more evidence based research needs to be conducted. There is a need for change in rehabilitation in ACLR rehabilitation and even though my clinical topic was not directly answered, the generalized research available can be deemed useful in this topic.

8 The Effect of Vestibular Rehabilitation on Athletes Diagnosed with a Concussion
Undergraduate Student Project in Math & Science
Jennifer Meyer
Dr. Laura McDonald
Vestibular rehabilitation may aid patients who suffer from concussion. However, stronger evidence is necessary before a change from current clinical practice of physical and cognitive rest is recommended.
11 Feline Chronic Gingivostomatitis
Undergraduate Student Project in Math & Science
Cailey O’Donnell
Dr. Jennifer Roberts
Feline chronic gingivostomatitis is a growing concern in veterinary dentistry.

14 The Paradox of Increased Patient Monitoring
Undergraduate Student Project in Nursing
Kenzie Murphy
Eleftheria Karapas
The paradox of increased patient monitoring alarm fatigue is the desensitized state of mind that results from a surplus of monitor alerts. Research reveals several causes of alarm fatigue. The resulting effect is the development of workaround strategies by nurses compromising patient safety. Nurses must incorporate clinical judgment to determine which patient alarms require immediate nursing action and which alarms can be excluded. Effective solutions have been identified to significantly reduce alarm fatigue.

17 Effects of Reporting Protocol on On-Campus Sexual Assaults
Undergraduate Student Project in Social Sciences
Allison Trendle
Dr. Tammy Thurman
The aim of this study is to examine the impact of college campus incident reporting protocols on sexual assault data to determine whether type of protocol or reporting procedure influences the frequency of reports recorded. Anonymous and in-person types of reporting are variables of interest. It is hypothesized that there is a positive correlation between anonymous reporting and the frequency of on-campus sexual assault reports, and a negative correlation between in-person reporting and frequency of on-campus sexual assault reports. Results from this study might help explain underreporting on university campuses and influence a potential change in university protocol and program planning for sexual assault reporting.

20 Drug Interactions and Phenotypic Variability Due to Cytochrome P450 Isoenzymes
Undergraduate Student Project in Math & Science
Adrian Kalata
Dr. Jennifer Roberts
Drug interactions and phenotypic variability due to Cytochrome P450 isoenzymes are presented.

23 Falling Fighters
Undergraduate Student Project in Math & Science
John Laschober & Kevin Gannon
Dr. Ray Klump
Our small, student-led group developed a video game from scratch, using the Unity game engine and integration with AirConsole’s API. The AirConsole platform allowed us a convenient means of playing the game with merely an average performance computer and a couple smartphones, playing the role as game pads. Overall, it took us 11 weeks to develop the game entirely and to reach a relatively polished state.

26 Yoga Stretching in Athletic Injury Prevention
Undergraduate Student Project in Math & Science
James Frederickson
Dr. Laura McDonald
Yoga stretching is a useful tool for athletic training rooms compared to standard preventative measures, such as hot pack therapy.

29 An Analysis of the Impact of U.S. Presidential Elections on Market Volatility
Undergraduate Student Project in Business
Dion Ursino & Matthew McConathy
Dr. Frank Rose
This research analyzes the impact of U.S. presidential campaigns/elections on stock and futures market volatility. Market prices and activity levels during elections from 1980 to the present are examined to a) describe any volatility changes that occurred during the election campaigns, and b) determine if there is a causal relationship between volatility and the campaigns.

32 Does Your Vote Really Matter?: A Look at Voter Statistics
Undergraduate Student Project in Math & Science
Joseph Russo & Joseph Feketch
Margaret Juraco
This project looks at the Electoral College and how it has elected the President of the United States throughout the history of the country every four years. By focusing on the elections of 2008, 2012, and 2016, the study analyzes how individual voters in states impact their states’ voting patterns. It also analyzes how each state has its own amount of electoral votes and how individual votes actually matter in order to push a state toward one candidate or another.

35 Pack Dynamics of the African Wild Dog
Undergraduate Student Project in Math & Science
Lis Hardin
Dr. Jennifer Roberts
Dominant females in African wild dog packs hormonally regulate subordinate members to suppress their estrus cycles.

38 Civil War Nutrition: A Look at How Soldiers Survived
Undergraduate Student Project in Education
Erin Doorneweerd & Emily Winterroth
Kathryn McSherry
The focus of this project is on what the Civil War soldiers ate during the War. Was the North fed better than the South? Could there have been a different outcome if the nutrition was better? These are just some of the questions we would like to focus on.

41 Investigating the Adsorption/Desorption Pathways of Nanoparticle Containing Cosmetics
Undergraduate Student Project in Math & Science
Jenna Saleh
Dr. Jason Keleher
While the use of nanotechnology in the cosmetic industry has steadily increased, there exists growing concern over the potential harm of nanoparticles utilized in various cosmetics to biological systems. The focus of this research is to demonstrate the relationship between solubility of cosmetic products and increased molecular
interactions at the cosmetic-skin interface, which will ultimately provide insight into the amount of energy required to effectively remove cosmetics from the skin. Investigations will be performed utilizing such analytical techniques as solubility tests, IR spectroscopy, contact angle, surface energy, and atomic force microscopy.

44 The pH Effect Influencing the Noncovalent Interactions Occurring Between 2,4-D Amine and Simulated Soil Conditions
Undergraduate Student Project in Math & Science
Jessica Tabert
Dr. Jason Keleher
The global epidemic of water contamination is partially attributed to the runoff and drift effects of herbicides, which are used largely in agriculture. Using simulated soil (silica particles) binding isotherms can be used to calculate the adsorption of 2,4-D Amine, an herbicide, in alternating pH conditions. In the system, the pH noncovalently interacts with the simulated soil condition differently due to the physicochemical adsorption occurring. By observing the role of adsorption interactions, a potential remediation pathway for treating the herbicide contamination can be proposed.

47 Goal Line Technology
Undergraduate Student Project in Math & Science
Ralf Zehnter
Dr. Charles Crowder
While goal line technology already exists, a big challenge is constructing the goal line technology to fit within college budgets. For this experiment, to keep it cost effective, the ball as well as the line will be magnetic. With Vernier probes as well as photo gates, the change in magnetic field and the velocity off the ball will be monitored when the ball is crossing the magnetic line, thus deciding if it’s a regular goal.

50 Political Violence and Democracy
Undergraduate Student Project in Humanities
Julio Lara
Dr. Steven Nawara
This work looks at both qualitative thinkers as well as quantitative data in order to determine the relationship between democracy and the state and the level of political violence it sees.

53 Optical Tweezers for Biomedical Research
Undergraduate Student Project in Math & Science
Thomas Beckmann & Sean Smyth
Dr. Charles Crowder
Optical tweezers in the visual spectrum were assembled and used to trap and manipulate microscopic polystyrene beads. Infrared optical tweezers will be built and used to trap biological specimens and study their interaction with various biomedical nanoparticles.

56 Passive Sampling of Polycyclic Aromatic Hydrocarbons Near Lewis University Airport and the Resulting Health Effects on Students
Undergraduate Student Project in Math & Science
Katelyn Liptrot
Dr. Teresa Bixby
The purpose of this research is to discover the amount of Polycyclic Aromatic Hydrocarbons (PAHs) present in the atmosphere near Lewis University airport. It is expected that the amount of PAH particles present in the atmosphere will increase near an airport compared to the apparatuses further from the airport. The data collected will be compared to the amount of PAHs in the atmosphere that the Environmental Protection Agency (EPA) deems to be threatening to one's health. If the amount of PAHs present on the Lewis University campus is found to be too high, awareness will be brought to the attention of the school as well as suggestion for moving the airstrip further from campus.

59 Functionalizing Polymers with Metal Nanoparticle Coated Titanium Dioxide for Antimicrobial Applications
Undergraduate Student Project in Math & Science
Lauren Werth, Arielle Floyd, Abigail Linhart, Dina Hejja & Dany Danhausen
Dr. Jason Keleher
This study focused on synthesizing antimicrobial polymers incorporated with gold nanoparticle coated titanium dioxide for industrial applications.

62 Physical Head Model for the Study of the Effects of Impacts on the Brain
Undergraduate Student Project in Math & Science
Kristian Bennett
Dr. Charles Crowder
The increase in awareness of concussions and traumatic brain injuries has led to an increase in research on the forces that result in these head injuries. The goal of this project is to create a physical model of a head to study the movement of the brain after a forceful impact. The model can help understand how the brain behaves in relation to impact as well as reduce the risk of impact injuries.

65 Removing Heavy Metal Ions from Soil Using Chelation
Undergraduate Student Project in Math & Science
Brenna Hyslop
Dr. Jason Keleher
This study investigates a way to successfully remove heavy metals such as cadmium, mercury, and lead from the soil while leaving the plant unharmed and consumable. More specifically, chelating agents will be tested based on their ability to form a stable complex with the metal in the presence of soil.

Undergraduate Student Project in Math & Science
Matthew Vazquez
Dr. Jason Keleher
Dye sensitized solar cells are an inexpensive but low efficient source of energy. This study demonstrates the synthesis of a zirconium based metal-organic framework (MOF) (UiO-66) that is deposited onto the solar cell. With the addition of a MOF, electron transfer and absorption range have the potential to be improved, to increase photovoltaic performance. Future work will incorporate additional MOFs and dyes.

71 Shuffle Randomization in Magic: The Gathering
Undergraduate Student Project in Math & Science
Wyatt Blatti
Dr. Amanda Harsy Ramsay
We look at shuffling for a card game and the mathematics behind it.
**Analysis of Genetic Variants of CDKN2A in Relation to Cancers**
Undergraduate Student Project in Math & Science

Erik Sanchez  
Dr. Sarah Powers

CDKN2A is the gene responsible for synthesizing the cyclin dependent kinase inhibitor p16INK4A, which directly prevents CDK4/6 interactions with D-type cyclins. Several mutations in p16INK4A associated with melanoma have been widely studied and documented, however most reported mutations have not been analyzed. Utilizing software that predicts protein structure from sequence, conclusions about functional integrity after mutation may be drawn. Of the 20 mutations examined, 4 present functional loss, while the rest prove inconclusive.

**Low Cost Analysis of Collision Force and Coefficient of Restitution**
Undergraduate Student Project in Math & Science

Kenneth Bunnell & Stephen Hiller  
Dr. Joseph Kozodrinski

The ability to take coefficient of restitution and force measurements with only a motion sensor would provide a low-cost way to analyze the material property and the interaction between the ball and the floor.

**The Analysis of the Effects of the Destructive Properties of Hydroxyl Radicals Formed Due to Amyloid Beta Overproduction in Alzheimer’s Disease**
Undergraduate Student Project in Math & Science

Michelle Fernandez  
Dr. Jason J. Keleher

Amyloid beta (Aβ), an essential protein in the brain, has been determined to cause Alzheimer’s due to destructive hydroxyl radicals that form once the protein aggregates. To study both Aβ and the radicals, various techniques, such as hydroxyl radical trapping and Western blotting, were utilized to gain a better understanding of the nature of the disease. This was done to determine possible preventative treatments that reduce the amount of Aβ buildup or radicals formed.
101 Seeing Calories and Food Through Mathematics
Undergraduate Student Project in Math & Science
Joe Garcia
Dr. Amanda Harsy Ramsay
This research will focus on components of the use of mathematics in calories and food.

104 Explorations of the Stern-Brocot Tree
Undergraduate Student Project in Math & Science
Quinn Stratton
Dr. Amanda Harsy Ramsay
The Stern-Brocot tree is explained and constructed. Connections between the SB tree and other areas of mathematics are explored, particularly the Farey Sequence, and the solutions to certain Diophantine equations.

107 Movement Analysis of a Hockey Puck
Undergraduate Student Project in Math & Science
Zachary Arcara
Zachary Binkley
Data analysis of a hockey puck’s movement on ice was studied. Data includes accelerometer and gyroscope for the puck, as well as the sensor inside a spherical ball.

110 Addition of a Cationic Dye to Nanotemplated Silica Sol-Gel
Undergraduate Student Project in Math & Science
John Hodul & Zachary Struzik
Dr. John Parker
This research investigates external factors that could alter the adsorption of dyes to the sol gel matrix utilizing a cationic dye.

111 Incorporating UAS-supplied Ground and Aerial Data into Emergency Response Applications
Graduate Student Project in Math & Science
Eric Swanson, Robert Landers & Adam Abbasi
Dr. Randal DeMik
Investigating the efficacy of unmanned aircraft system (UAS) platforms for augmented reality technologies in enhancing situational awareness in emergency response situations.

113 The Math Behind Gerrymandering
Undergraduate Student Project in Math & Science
Jacob Gillis
Dr. Amanda Harsy Ramsay
In recent years the gerrymandering of district boundaries has caused a turmoil on the effects of political outcomes. These outcomes usually are due to a political party redrawing the lines in order to maintain power and skew voting results to their favor. Within this project we will discuss the rules and mathematics behind how these boundaries are moved, as well as how the rules are manipulated. We will then attempt to analyze how the movements of these lines have affected Illinois over time.

116 Surface Tension Analysis of Nanotemplated Silica Sol-Gel Dye Absorption
Undergraduate Student Project in Math & Science
Michael Sulwer
Dr. John Parker
Surface tension analysis methods were used to learn more about the dye absorption process in nanotemplated silica sol-gel.

122 Incorporating UAS-supplied Ground and Aerial Data into Emergency Response Applications
Graduate Student Project in Math & Science
Eric Swanson, Robert Landers & Adam Abbasi
Dr. Randal DeMik
Investigating the efficacy of unmanned aircraft system (UAS) platforms for augmented reality technologies in enhancing situational awareness in emergency response situations.

119 Low Cost Method for Desalination of Water with Solar Energy
Undergraduate Student Project in Math & Science
Tyler Dundek
Dr. Joseph Kozmins
This research looks to use a preexisting design for a solar steam generator and further the technology for use in desalination. Efficiency and more eco-friendly materials will be researched as well.

SESSION C
4:30-5:30 PM

3 Which Career is Right for Me?
Graduate Student Project in Education
Kristina Turek
Leonard Harsy
The importance of applying for college and selecting a major of interest is so crucial to a student’s education. There are many helpful resources students can access for help regarding selecting a college major and a career. Career fairs, college counselors, and mentors have been reported to be very beneficial to students. Depending on what the student believes is most important to them when selecting a career, an advisor can help narrow down the options to fit what is most beneficial to them.

6 Measuring and Creating a Safety Culture Within the Technical Operations Division of a Major U.S. Airline
Graduate Student Project in Math & Science
Brian Douglas, Carolina Garcia & Simon Mellichson
Dr. Randal DeMik
A major U.S. airline’s Safety and Regulatory Compliance department began a pilot project to measure, and in turn, manage safety culture using three core attributes – Knowledge, Detection and Enforcement (KDE).

9 The Interaction of Particles with an Alcubierre Space-time
Graduate Student Project in Math & Science
Sean Lillis
Dr. Ryan Hooper
The interactions of both null and massive particles with the Alcubierre Warp Drive were modeled using MAPLE, a modeling software. Particles trapped in the warp bubble while it was in transit were found to be trapped at a distance independent of their origin, making it possible for the crew of the ship to predict the particle positions and utilize them to their advantage.
12 Clinical vs. School Counseling: Ethical Dilemmas
Graduate Student Project in Social Sciences
Lindsay Cabay, Michael Twombly & Angelica Kladis
Dr. John Jurowicz
A comparison of the similarities and differences concerning ethical dilemmas in a school counseling session and clinical counseling session.

15 Stress in High School Students
Graduate Student Project in Education
Gretchen Mayhood
Leonard Harsy
Stress is very common among high school students. As school counselors, we need to be able to help them cope. There are severe effects to chronic stress and pressure. However, there are coping methods available.

18 Determining the Efficiency of Advanced Wearable Technology on Order Fulfillment for Air Cargo and Ground Transportation Strategies
Graduate Student Project in Math & Science
George Kemp, Syed Al-Hasni, Delia Vargas & Eric Nyantakyi
Dr. Randal DeMik
This study will analyze methods of order fulfillment from the traditional manual pick to the advanced wearable technology within a distribution center.

21 Protecting Patients from Harm in the Operating Room by Making Timeouts More Effective
Graduate Student Project in Nursing
Hayley Kabala Jones
Dr. Kathleen Blanchfield
The purpose of this White Paper is to promote the recognition of the need for effective timeout completion in the operating room. With sentinel events continuing to occur and the top two sentinel events being operating room/timeout related, it is essential for reevaluation of the current timeout processes.

24 Technology in Counseling: Innovative or a Liability
Graduate Student Project in Social Sciences
Megan Scanlon, Kylie Wilson & Gloridy Taloff
Dr. John Jurowicz
This research project will explore the advantages and disadvantages of social media and technology in the counseling relationship.

27 Assisting Immigrant Students
Graduate Student Project in Education
Lisa Romero
Leonard Harsy
Education is a means of empowerment. Education opens the door to the possibility of a better future and a better life. Many of us take the privilege of being able to attend school for granted. According to the American Immigration Council website, approximately 65,000 undocumented students graduate from high school each year who are not legally allowed to go to college in 40 states, join the military or pursue their dreams.

30 Increasing Safety: A Strategic Approach Through a Safety Management System
Graduate Student Project in Math & Science
Megan Zahos & Matthew Berger
Megan Zahos
A well developed Safety Management System (SMS) may create a stronger safety culture that can be maintained and supports constant improvement. In phase 1 of the study we will attempt to determine the status of the current safety culture and if the implementation efforts that are being undertaken have been successful. Using safety reports and culture surveys an analysis of the effects the SMS has had to this point will be made utilizing a repeated dependent measures t-test of the surveys given six months apart and of the number and quality of ASAP reports gathered.

33 Reducing Infusion Air In Line (AIL) Alarms: A Literature Review
Graduate Student Project in Nursing
Donna Matocha
Dr. Daisy Sherry
AIL alarms are among the highest in volume when compared to all infusion alarm categories. Understanding where the risk of air formation lies within the infusion system (fluid container to the patient’s vascular access device) provides clinicians with the skills to manage and reduce not only air formation but infusion alarms. Improving nursing knowledge of the factors that cause AIL will improve patient safety, decrease infusion alarms, and provide for appropriate delivery of intravenous medications.

36 Professional Boundaries in Therapeutic Relationships in Counseling
Graduate Student Project in Social Sciences
Lauren Mock, Lauren Bajek & John Kuzelka
Dr. John Jurowicz
There is a significant amount of scholarly writing on the importance of professional boundaries in counseling relationships. We will compile some of this research to demonstrate the importance of defining and maintaining appropriate boundaries between a counselor and client.

39 Exploring New Horizons and Perspectives Beyond the Classroom
Graduate Student Project in Education
AnnMarie Bachmann
Dr. Christopher Palmi
Traveling abroad takes us out of our comfort zones. We experience different cultures and see the world from different perspectives. In this presentation, I will see how individuals’ attitudes on world travel influence an individual’s thoughts on multiculturalism and social justice issues. The goal of this research is to illustrate the importance of traveling abroad, especially as a young adult. Traveling enhances numerous skills that young adults need to succeed in life, and it gives them a chance to alter their worldview that they have developed throughout their education.
**Designing a Photocatalytic Biomimetic Nanocomposite Material for Enhanced Water Filtration Applications**

*Graduate Student Project in Math & Science*

Jacob Murray, Samuel Baker & Alan Braschinsky

Dr. Jason Keleher

The research presented herein looks at the removal of a model pollutant through the use of semiconducting nanoparticles. Initial results reveal that by functionalizing these particles with different chromophores and metals that the rate of pollutant remediation could be significantly enhanced. These visibly active particles were then deposited into a biomimetic polymer and tested for practical use as a water filtration media.

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**Ethical Issues of Social Media in Counseling**

*Graduate Student Project in Social Sciences*

William Gommel, Kornelija Dunojute & Danielle Karcz

Dr. John Jurowicz

Social media has evolved in today’s society requiring counselors to take important precautions to ensure that ethical boundaries are not crossed with a client. This research will provide insight on the negative and positive impacts along with the necessary precautions counselors need to take.

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**Futile Care and Moral Distress: An Examination of the Ethical Implications of Ineffective End-of-Life Care**

*Graduate Student Project in Nursing*

Kimberly Scheffel

Dr. Kathleen Blanchfield

This presentation addresses the ethical implications of prolonging a patient’s life regardless of clinical outcome and the moral distress that nurses and other health professionals experience when forced to prolong a patient’s suffering when medical intervention is no longer beneficial. Evidence based recommendations aimed at fostering a more holistic approach to end-of-life care are identified and described. In addition, evidence based interventions designed to combat moral distress are identified and explored.

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**Mind Over Subject Matter: Impact of Mindfulness in the Classroom Setting**

*Graduate Student Project in Education*

Ashley Castillo

Dr. Jennifer Consilio

The importance of students’ psychological wellbeing should be considered by all teachers in a classroom setting as it is directly linked to their growth and advancement towards success. Incorporating mindfulness in the classroom will provide students with opportunities to reap the benefits of social emotional learning (SEL), attention, and compassion for bettering their personal lives and encounter academic growth. This study will research and analyze the results of including mindfulness in a classroom and the benefits provided.

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**Unravelling Key Noncovalent Interactions on the Adsorption Mechanism to Environmentally Relevant Substrates**

*Graduate Student Project in Math & Science*

Kaitlyn Curtis

Dr. Jason Keleher

The research presented investigates the binding interactions occurring between a pesticide and different environmentally relevant substrates. After determining this relationship, the remediation pathway is initially examined through means of photocatalytic degradation.

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**New Nurse Practitioners Transition into Practice**

*Graduate Student Project in Nursing*

Christina McBride

Dr. Suling Li

Nurse Practitioners currently do not have a standardized program to help them transition into their role after they complete their education and become licensed. The purpose of this literature review was to determine how nurse practitioners are transitioning into practice as healthcare providers.

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**Utilizing Mindfulness in DBT to Treat Trauma Related Disorders in Children and Adolescents**

*Graduate Student Project in Social Sciences*

Joan Lockridge

Dr. Katherine Helm

The purpose of this presentation is to inform individuals about the effectiveness of utilizing mindfulness to treat victims of trauma.

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**Helping Students Achieving Academic Success in High School by Strengthening Executive Function Skills**

*Graduate Student Project in Education*

Elizabeth Galka

Leonard Harsy

Effective use of executive function skills is crucial to success in adults. They are taught and strengthened in schools, but for various reasons, some students are not successful in learning or building upon these skills. This study looks at the types of interventions that can be utilized to strengthen these skills in high school-aged students, as well as looking at the variability of the incorporation of these skills in a general high school curriculum.
Optimization of Nanocomposite Solar Cell/Liquid Crystal Matrix to Diminish High Intensity Laser Light Relevant to Aviation Safety Applications

Graduate Student Project in Math & Science
James Hofmann
Dr. Jason Keleher

This research seeks to understand the effect of various organic dyes on the performance of dye sensitized solar cells. Additionally, work has been done to minimize the switching voltage of a liquid crystal cell. Link together, and the solar cells are capable of switching the liquid crystals to block incoming laser light.

Domestic Abuse Prevention for Ninth-Graders

Graduate Student Project in Nursing
Teresa Dubovich
Dr. Daisy Sherry

This project is a program evaluation of a domestic abuse prevention program for ninth-graders at a Chicago public high school presented by a community agency.

Using Adlerian Theory to Investigate How Passive and Dominance is Dictated by Birth Order

Graduate Student Project in Social Sciences
Magen Lutz, Nicole Deischer, Gloria Taloff & Kiara Meeks
Dr. Katherine Helm

This study uses Adlerian Theory to investigate how passive and dominance is shaped by birth order.

Attitudes of Middle School and High School Students from High-Needs School Districts Regarding STEM

Graduate Student Project in Education
Brandon Ceplecha & Emily Pearson
Dr. Erica Kwiatkowski-Egizio

Our research will study how much knowledge and experience students from high-needs middle and high schools have with STEM activities. We want to analyze how students of varying genders, ethnicities, and socioeconomic statuses view STEM.

Effect of Molecular Structure on Modulation of Passivation Films on Copper Chemical Mechanical Planarization

Graduate Student Project in Math & Science
Amy Mlynarski
Dr. Jason Keleher

This study probes the underlying mechanism of the film formation relevant to copper substrates, depending on the chemical and mechanical parameters used. The resulting films are characterized by the efficiency of film removal as well as the corresponding surface quality on the copper surface.

Early Mobilization for DVT Prevention

Graduate Student Project in Nursing
Noelle Curry
Dr. Stacie Elder

Current practices for deep vein thrombosis (DVT) prevention among orthopedic patients are not adequate. This proposal uses the intervention of early mobilization to combat the persistent problem of DVT among orthopedic patients. The overall goal is to reduce rates of DVT and shorten the length of hospital stay, which benefits the patients and hospitals.

Exploring Key Interactions Between Surfactants, Polyelectrolytes, and Nanoparticles to Enhance Post-CMP Cleaning of Semiconductor Wafers

Graduate Student Project in Math & Science
Tala Zubi & Brian Sherry
Dr. Jason Keleher

Semiconductor wafers are commonly cleaned with a concentrated ammonium hydroxide and peroxide solution known as SC1. This process is designed to remove particles and organic contaminants, but becomes ineffective with excess contamination. In an attempt to replace SC1 as the dominant cleaning process, this work investigated surfactant and polyelectrolyte based cleaners to chemically desorb particles and prevent recontamination of the wafer.

Synthesis of Conductive Polymeric Nanocomposite for Applications in Responsive Materials

Graduate Student Project in Math & Science
Jessica Chavez
Dr. Jason Keleher

To further study wearable technology, conductive polymers were integrated into textile materials for the fabrication of ‘smart’ fabrics. Conductive polymeric nanocomposites were synthesized by incorporating polyaniline and polypyrrole into a cellulose acetate matrix. These conductive thin film and fiber nanocomposites were characterized for their conductance efficiency and applied to various applications.
The Use of Hands-on Activities and Students’ Attitudes Toward Mathematics

Caitlin Moeller
Dr. Erica Kwiatkowski-Egizio
With the ever-increasing demand for people to enter STEM fields and careers, interest in mathematics must be fostered in the classroom. Hands-on math activities allow students to become more actively involved in the learning process while demonstrating mathematical reasoning and giving a concrete representation of abstract concepts. This research aims to determine whether the implementation of hands-on activities in the high school mathematics classroom positively influences students’ attitudes toward mathematics.

The Development of a Cross-Linked Cyclodextrin-Based Water Filtration System for the Removal of Metal Ions

Katelyn Lanasky
Dr. Jason Keleher
This work focuses on the development of a cost-effective water filtration system utilizing the supramolecular structure of β-cyclodextrin to rapidly remove metal ions.

Use of Video Orientation to Decrease Stress in Nursing Students Related to Simulation Participation

Angeline Brooker, Christine Blake & Christa Nelson
Dr. Gwen Svoboda
This presentation offers the utilization of an alternate modality of introducing the simulation environment to pre-licensure nursing students. Given the increased use of simulation practice in nursing curriculums, attempts to mitigate feelings of stress related to simulation participation needs to be explored. The purpose of this project is to develop an informational video introducing a simulated learning environment, and the process of debriefing, to nursing students in an effort to decrease stress related to simulation participation. This presentation will also provide a data analysis from pre-video and post-video surveys regarding nursing student perceptions of the video and the impact on stress. Since simulation is also being used as an educational tool for staff in hospital environments, the video will also be shown to a select group of hospital-based educators. Feedback in regards to the usefulness of the video in the clinical arena for experienced staff nurses’ participation in simulation will also be presented.

Energy Considerations in the Einstein Equation

Matthew Kubacki
Dr. Ryan Hooper
Modeling different Spacetime Curvatures using the computer program Maple. These spacetimes can be mathematically expressed via the Einstein Equation. Out of the Einstein Equation, an energy value is extracted and compared to expected values.

Narrative Therapy’s Effect on Depression

Danielle Van De North, Despina Stathopoulos, Jeff Weiss, Monica Figus & Jonathan Van Ordstrand
Dr. Katherine Helm
Narrative therapy’s effect on depression is presented.

A Metal-Organic Framework Nanocomposite for the Remediation of Water-Based Pollutants

Thomas Rickhoff, Nikolas Paramo, Matthew Vazquez & Liana Bueno
Dr. Daniel Kissel
The scarcity of potable water has become an ever-increasing global problem which has accelerated the need for cost-effective water purification technologies. The work presented here focuses on the synthesis and characterization of a novel nanocomposite and its ability to remediate a wide range of water-based pollutants through adsorption. This material, which consists of a copper-based metal-organic framework (MOF) known as HKUST-1 (MOF-199) has been incorporated into a cellulose matrix and formed into a spherical bead.

Evaluating a Functional Aircraft Cockpit Display for High Altitude Energy Management

Kyle Meyer
Erik Baker
This study will compare the effectiveness of a conventional PFD and the OZ concept aircraft cockpit display at providing EM SA to participant pilots during simulated high altitude cruise flight operations.

Kyphoplasty Education

Shauntel Ferguson & Tamara Grimes
Dr. Gwen Svoboda
Scholarly work created to enhance learning and competency for nurses caring for patients undergoing kyphoplasty procedures.

Evaluation of Biofilm Formation on Microbial Fuel Cell Electrode Surfaces Using Atomic Force Microscopy

Nicole Yuede & Elizabeth Senese
Dr. Jason Keleher
This work utilizes Atomic Force Microscopy to correlate biofilm formation kinetics and subsequent topography to redox activity on a surface. Understanding these films will aid in functionalization of polymeric electrodes that increase binding efficiency and electrical output in a microbial fuel cell.
SESSION A

2-3 PM

3 A-Block
Undergraduate Student Project
Cache Binion
Kristin Burton
My plan is to expand my non-for-profit organization, and build recreational centers across the Chicagoland area. The rec centers will house a studio with production equipment, that will allow people to come in and work hands on and learn a new craft. There will also be a dance studio on the lower level as well as an indoor basketball court. The dance studio will allow children to come in and explore new talents and they will also have opportunities to compete in competitions and show off their talents. The basketball courts will produce other opportunities of its own, with skill sessions taught and college recruitment involvement to place initiatives around higher education and positive behaviors.

5 Zizi’s Berries
Undergraduate Student Project
Habel Mulumbi
Kristin Burton
A company with the vision of satisfying the large in-high demand product that is not only beneficial to the investors, but to the community and country as a whole. Zizi's Berries is the future of agriculture in Machakos county.

9 Fire & Ice Sports Complex
Undergraduate Student Project
Lauren Mulcahy & Jake Wayner
Kristin Burton
An innovative, multi-use sports complex unlike no other. This family-friendly arena is designed to accommodate many different sporting events, as well as convert into a modern, professional business area to host banquets and corporate events.

11 BVigilant
Undergraduate Student Project
Ryan Walker
Kristin Burton
BVigilant is a crowd sourcing platform that connects businesses with thousands of software and security engineers to discover vulnerabilities in a business’ critical infrastructure and software quickly and efficiently. By providing monetary rewards, called ‘Bug Bounties,’ to those who find these vulnerabilities, it incentivizes the highest level of skilled engineers to tackle the challenge of mitigating risk and aiding against the rise of security breaches due to unknown bugs in a company’s software.

17 Social Media Marketing for Small Businesses
Undergraduate Student Project
Christopher Cooper
Kristin Burton
The overall goal of this business is to establish, improve, and maintain websites and social media for small businesses. Through the use of online marketing, our company will reach out and attract potential or pre-existing consumers.

19 Magiclean Janitorial Service
Undergraduate Student Project
Robert Jaworsky
Kristin Burton
Magiclean Janitorial Service is a commercial cleaning company. We believe in a quality cleaning service for the best price.

21 Camp Unstoppable
Undergraduate Student Project
Marleny Guzman
Kristin Burton
Camp Unstoppable is a summer camp created to cater to the needs of kids with disabilities. The camp will provide a safe and fun-filled environment that teaches kids how to lead healthy active lives.
SESSION B
3:15-4:15 PM

4 Safe-Wear
Undergraduate Student Project
Nicholas Varman
Kristin Burton
Safe-Wear manufactures and resales a t-shirt life jacket that inflates when submerged in water along with a heating element to prevent individuals from becoming hypothermic upon falling into freezing water. This product would be lightweight material to allow for layering and storage.

6 Blue Jellyfish Print
Undergraduate Student Project
Julia Zeler
Kristin Burton
Blue Jellyfish Print is a printing service aimed specifically at artists, providing a wide range of high quality prints ready for artist’s conventions and artist allies, as well as products like custom cut stickers, pins, key chains, posters, etc. Our goal is to provide beginning and hobbyist artists a cheap but high quality service for getting their foot in the door, and also catering to professional artists by being a service that can save them time and money and being something they can rely on.

12 Fur-Bit
Undergraduate Student Project
Nicole Carli
Kristin Burton
The Fur-Bit is a collar that keeps track of your dog with GPS.

16 Berry Delicious Blueberries LLC
Undergraduate Student Project
Diego Avalos
Kristin Burton
A blueberry farm specializing in growing, packaging, and distributing fresh and frozen blueberries to wholesalers, supermarkets, bakeries, and end consumers in the Chicagoland area and southwest Michigan. The end goal is to bring a knowledgeable, healthy, and happy eating experience to communities and families, while providing all generations with a berry delicious experience.

18 Catch-A-Cart
Undergraduate Student Project
Matthew Searles
Kristin Burton
A university-provided golf cart transportation service to campus events, class or dining halls.

22 WestonTech
Undergraduate Student Project
Jeremy Weston
Dr. Safwan Omari
WestonTech is an all-in-one technology service company offering an unmatched level of support. We’re here to help! Our mission is to provide professional and reliable technology services to the people and businesses in our community. Whether you’re looking to setup, secure, or repair your technology, we’ve got the tools, knowledge, and dedication to get the job done.
## PRESENTERS INDEX

<table>
<thead>
<tr>
<th>A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbasi</td>
<td>Adam – 9, 19</td>
</tr>
<tr>
<td>Alfaro</td>
<td>Paul – 6</td>
</tr>
<tr>
<td>Al-Hasni</td>
<td>Syed – 20</td>
</tr>
<tr>
<td>Arcara</td>
<td>Zachary – 6, 19</td>
</tr>
<tr>
<td>Avalos</td>
<td>Diego – 25</td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Bachmann</td>
<td>AnnMarie – 20</td>
</tr>
<tr>
<td>Baijek</td>
<td>Lauren – 20</td>
</tr>
<tr>
<td>Baker</td>
<td>Samuel – 21</td>
</tr>
<tr>
<td>Barnat</td>
<td>Larissa – 10</td>
</tr>
<tr>
<td>Beckmann</td>
<td>Thomas – 17</td>
</tr>
<tr>
<td>Bennett</td>
<td>Kristian – 17</td>
</tr>
<tr>
<td>Berger</td>
<td>Matthew – 20</td>
</tr>
<tr>
<td>Bertrand</td>
<td>Mikayla – 15</td>
</tr>
<tr>
<td>Bieker</td>
<td>Abigail – 7</td>
</tr>
<tr>
<td>Binion</td>
<td>Cache – 24</td>
</tr>
<tr>
<td>Blake</td>
<td>Christine – 23</td>
</tr>
<tr>
<td>Blatti</td>
<td>Ethan – 18</td>
</tr>
<tr>
<td>Blatti</td>
<td>Wyatt – 17</td>
</tr>
<tr>
<td>Braschinsky</td>
<td>Alan – 21</td>
</tr>
<tr>
<td>Brooker</td>
<td>Angeline – 23</td>
</tr>
<tr>
<td>Bueno</td>
<td>Liana – 23</td>
</tr>
<tr>
<td>Bunnell</td>
<td>Kenneth – 18</td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Cabay</td>
<td>Lindsay – 20</td>
</tr>
<tr>
<td>Carlì</td>
<td>Nicole – 25</td>
</tr>
<tr>
<td>Castillo</td>
<td>Ashley – 21</td>
</tr>
<tr>
<td>Ceplecha</td>
<td>Brandon – 22</td>
</tr>
<tr>
<td>Cerda</td>
<td>Marc – 14</td>
</tr>
<tr>
<td>Chavez</td>
<td>Jessica – 22</td>
</tr>
<tr>
<td>Childs</td>
<td>Connor – 14</td>
</tr>
<tr>
<td>Cobb</td>
<td>Melonee – 8</td>
</tr>
<tr>
<td>Cochran</td>
<td>Tara – 6</td>
</tr>
<tr>
<td>Cochran</td>
<td>Taylor – 6</td>
</tr>
<tr>
<td>Cooper</td>
<td>Christopher – 24</td>
</tr>
<tr>
<td>Costabile</td>
<td>Troy – 6</td>
</tr>
<tr>
<td>Cremerius</td>
<td>Paige – 8</td>
</tr>
<tr>
<td>Curry</td>
<td>Noelle – 22</td>
</tr>
<tr>
<td>Curtis</td>
<td>Kaitlyn – 21</td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Danhausen</td>
<td>Dany – 17</td>
</tr>
<tr>
<td>Day</td>
<td>Markie – 13</td>
</tr>
<tr>
<td>De Avila</td>
<td>Karina – 6</td>
</tr>
<tr>
<td>Deischer</td>
<td>Nicole – 22</td>
</tr>
<tr>
<td>Dial</td>
<td>Courtney – 7, 12</td>
</tr>
<tr>
<td>Domenico</td>
<td>Jared – 6</td>
</tr>
<tr>
<td>Dominici</td>
<td>Angela – 13</td>
</tr>
<tr>
<td>Doornweerd</td>
<td>Erin – 16</td>
</tr>
<tr>
<td>Douglas</td>
<td>Brian – 19</td>
</tr>
<tr>
<td>Dubiel</td>
<td>Ivette – 8</td>
</tr>
<tr>
<td>Dubiel</td>
<td>Matthew – 6, 14</td>
</tr>
<tr>
<td>Dubovich</td>
<td>Teresa – 22</td>
</tr>
<tr>
<td>Dudaski</td>
<td>Robert – 18</td>
</tr>
<tr>
<td>Dundek</td>
<td>Tyler – 19</td>
</tr>
<tr>
<td>Dunojute</td>
<td>Kornelija – 21</td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Estrada</td>
<td>Angelica – 14</td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Fekech</td>
<td>Joseph – 16</td>
</tr>
<tr>
<td>Ferguson</td>
<td>Shauntel – 23</td>
</tr>
<tr>
<td>Fernandez</td>
<td>Michelle – 12, 18</td>
</tr>
<tr>
<td>Figus</td>
<td>Monica – 23</td>
</tr>
<tr>
<td>Floyd</td>
<td>Arielle – 17</td>
</tr>
<tr>
<td>Frederickson</td>
<td>James – 16</td>
</tr>
<tr>
<td>Fuller</td>
<td>Mackenzie – 11</td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>Gagnon</td>
<td>David – 7</td>
</tr>
<tr>
<td>Galka</td>
<td>Elizabeth – 21</td>
</tr>
<tr>
<td>Gannon</td>
<td>Kevin – 16</td>
</tr>
<tr>
<td>Garcia</td>
<td>Carolina – 19</td>
</tr>
<tr>
<td>Garcia</td>
<td>Joe – 19</td>
</tr>
<tr>
<td>Gedzky-Nieman</td>
<td>Stephanie – 12</td>
</tr>
<tr>
<td>Geier</td>
<td>Elizabeth – 15</td>
</tr>
<tr>
<td>Gennett</td>
<td>Samantha – 7</td>
</tr>
<tr>
<td>Gieseler</td>
<td>Amanda – 7</td>
</tr>
<tr>
<td>Gillis</td>
<td>Jacob – 19</td>
</tr>
<tr>
<td>Gommel</td>
<td>William – 21</td>
</tr>
<tr>
<td>Graverson</td>
<td>Carolyn – 12</td>
</tr>
<tr>
<td>Green</td>
<td>Alison – 11</td>
</tr>
<tr>
<td>Green</td>
<td>Kelly – 10</td>
</tr>
<tr>
<td>Greminger</td>
<td>Caitlyn – 11</td>
</tr>
<tr>
<td>Grimes</td>
<td>Tamara – 23</td>
</tr>
<tr>
<td>Grossart</td>
<td>Brian – 15</td>
</tr>
<tr>
<td>Guzman</td>
<td>Marleny – 24</td>
</tr>
<tr>
<td>H</td>
<td></td>
</tr>
<tr>
<td>Hardin</td>
<td>Lis – 16</td>
</tr>
<tr>
<td>Harnett</td>
<td>Laurel – 11</td>
</tr>
<tr>
<td>Hauert</td>
<td>Brittany – 13</td>
</tr>
<tr>
<td>Hejja</td>
<td>Dina – 17</td>
</tr>
<tr>
<td>Herrera-Rivera</td>
<td>Josephine – 9</td>
</tr>
<tr>
<td>Hiller</td>
<td>Stephen – 18</td>
</tr>
<tr>
<td>Hodul</td>
<td>John – 12, 19</td>
</tr>
<tr>
<td>Hofmann</td>
<td>James – 22</td>
</tr>
<tr>
<td>Holm</td>
<td>Andrea – 7</td>
</tr>
<tr>
<td>Horeni</td>
<td>Mark – 14</td>
</tr>
<tr>
<td>Huggins</td>
<td>Mary – 11</td>
</tr>
<tr>
<td>Hyslop</td>
<td>Brenna – 17</td>
</tr>
<tr>
<td>J</td>
<td></td>
</tr>
<tr>
<td>Jaworsky</td>
<td>Robert – 24</td>
</tr>
<tr>
<td>Jones</td>
<td>Hayley Kabala – 20</td>
</tr>
<tr>
<td>Jonic</td>
<td>Alexander – 14</td>
</tr>
<tr>
<td>Joutras</td>
<td>Brandon – 14</td>
</tr>
<tr>
<td>Jozefat</td>
<td>Andrea – 11</td>
</tr>
<tr>
<td>K</td>
<td></td>
</tr>
<tr>
<td>Kalata</td>
<td>Adrian – 16</td>
</tr>
<tr>
<td>Karapas</td>
<td>Eletheria – 15</td>
</tr>
<tr>
<td>Karcz</td>
<td>Danielle – 21</td>
</tr>
<tr>
<td>Kemp</td>
<td>George – 20</td>
</tr>
<tr>
<td>Khan</td>
<td>Hafsia – 18</td>
</tr>
<tr>
<td>King</td>
<td>Jessica – 11</td>
</tr>
<tr>
<td>Kladis</td>
<td>Angelica – 20</td>
</tr>
<tr>
<td>Klaff</td>
<td>Rebecca – 9</td>
</tr>
<tr>
<td>Kolesinski</td>
<td>Phillip – 18</td>
</tr>
<tr>
<td>Kubacki</td>
<td>Matthew – 23</td>
</tr>
<tr>
<td>Kummer</td>
<td>MacKenzie – 18</td>
</tr>
<tr>
<td>Kuzelka</td>
<td>John – 20</td>
</tr>
<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Lambert III</td>
<td>Joseph – 12</td>
</tr>
<tr>
<td>Lanasky</td>
<td>Katelyn – 23</td>
</tr>
<tr>
<td>Landers</td>
<td>Robert – 9, 19</td>
</tr>
<tr>
<td>Lange</td>
<td>Heather – 13</td>
</tr>
<tr>
<td>Lara</td>
<td>Julio – 17</td>
</tr>
<tr>
<td>Laschober</td>
<td>John – 16</td>
</tr>
<tr>
<td>Layfield</td>
<td>Morgan – 18</td>
</tr>
<tr>
<td>Leong</td>
<td>Eric – 15</td>
</tr>
<tr>
<td>Lillis</td>
<td>Sean – 19</td>
</tr>
<tr>
<td>Linhart</td>
<td>Abigail – 17</td>
</tr>
<tr>
<td>Liptrot</td>
<td>Katelyn – 17</td>
</tr>
<tr>
<td>Llinás Rosa</td>
<td>Giovanni – 12</td>
</tr>
<tr>
<td>Lockbridge</td>
<td>Joan – 21</td>
</tr>
<tr>
<td>Lutz</td>
<td>Magen – 22</td>
</tr>
</tbody>
</table>
Marker, Robert – 13
Maska, Richard – 8
Matocha, Donna – 20
Mayhood, Gretchen – 20
Mayotte, Darrin – 14
Maza, Matt – 8
McBride, Christina – 21
McConathy, Matthew – 16
McEvilly, Molly – 12
McLawnhorn, Kaley – 8
McMahon, Eileen – 9
Meeks, Kiara – 22
Meilichson, Simon – 19
Mescioglu, Ibrahim – 8
Meyer, Jennifer – 15
Meyer, Kyle – 23
Mikos, Allie – 12
Mistry, Neera – 13
Mlynarski, Amy – 13, 22
Mock, Lauren – 20
Moeller, Caitlin – 23
Montgomery, Shinora – 8
Morrison, John – 6
Moustakas, Trace – 6
Mrowczynski, Bill – 8
Mulcahy, Lauren – 24
Mulumbi, Habel – 24
Murphy, Kenzie – 16
Murray, Jacob – 21

Navarro, Martha – 8
Nelson, Christa – 23
Noe, Amanda – 9
Nyantakyi, Eric – 20

O’Donnell, Cailey – 16
O’Hagan, Kathleen – 6
Onesto, Joseph – 13

Palm, Natalie – 12
Paramo, Nikolas – 23
Patrick, Erin – 6
Pearson, Emily – 22
Persicetti, Abby – 6
Przekwas, Elizabeth – 7
Qadir, Saniya – 14
Quarles, Ceirstan – 9
Raschke, Carl – 6
Rickhoff, Thomas – 23
Rogala, Katherine – 14
Romero, Lisa – 20
Rook, Brendan – 6
Russo, Joseph – 16

Salas, Chris – 18
Saleh, Jenna – 16
Salinas, Maria – 18
Sallée, Jonathan – 8
Sanchez, Erik – 18
Sangchot, Eakapon – 8
Santefort, David – 15
Saucedo, Cynthia – 18
Scanlon, Megan – 20
Scheffel, Kimberly – 21
Scott, Bree – 7
Searles, Matthew – 25
Senese, Elizabeth – 23
Seum, Steven – 7
Shanahan, Jordan – 15
Sherry, Brian – 22
Siwy, Adrian – 18
Smith, Paige – 14
Smith, Ryan – 11
Smyth, Sean – 17
Sriboonruang, Penluck – 8
Stajura, Ashley – 7
Stathopoulos, Despina – 23
Stratton, Quinn – 19
Struzik, Zachary – 13, 19
Sulwer, Michael – 19
Swanson, Eric – 9, 19
Swientek, Sarah – 15

Tabert, Jessica – 17
Taloff, Gloridy – 20, 22
Taylor, Keanu – 7
Thornton, Jessica – 10
Tovar, Lynn – 7, 9
Trendle, Allison – 16
Turek, Kristina – 19
Twombly, Michael – 20

Ursino, Dion – 16
Van De North, Danielle – 23
Van Ordstrand, Jonathan – 23
Vargas, Delia – 20
Varman, Nicholas – 25
Vazquez, Matthew – 17, 23
Vihnanek, Emily – 7, 14

Walker, Ryan – 24
Waters, Jackson – 6
Wayner, Jake – 24
Weiss, Jeff – 23
Werth, Lauren – 13
Weston, Jeremy – 25
Wiencek, Richard – 13
Wilson, Kylie – 20
Winterroth, Emily – 16
Wortman-Otto, Katherine – 18

Yuede, Nicole – 23
Zahos, Megan – 20
Zak, Skyler – 7
Zehnter, Ralf – 17
Zeler, Julia – 25
Ziegenhorn, Alexander – 13
Zizich, Ashley – 7
Zubi, Talia – 22
Zwartz, Michael – 14
President’s Ninth Annual Art Exhibition

**Reception & Awards:** April 19, 2017, 7-9 PM  
**On View:** April 7-28, 2017

Brent and Jean Wadsworth Family Gallery, Oremus Fine Arts Center

Featuring highlights of Lewis University student and alumni artwork. This important juried exhibition is hosted by the Department of Art and Design and President Dr. David Livingston.

Philip Lynch Theatre Production of “A Midsummer Night’s Dream” by William Shakespeare

**Special Preview:** April 20, 2017, 7 PM  
**Performances:** April 21-23 & April 27-30, 2017

The Philip Lynch Theatre brings to the stage one of Shakespeare’s most popular plays, “A Midsummer Night’s Dream.” It portrays the adventures of four young Athenian lovers, a group of amateur actors, and the fairies who inhabit a moonlit forest. “A Midsummer Night’s Dream” was written in 1595 or 1596. Some experts believe it was written to have its first performance in the gardens of a great country estate for the celebrations of an aristocratic wedding. As the fictional newlyweds watch Bottom and his friends performing “Pyramus and Thisbe,” they were in turn being watched by a real-life bride and groom! Shakespeare’s beloved romantic comedy contains a play-within-a-play and a world-within-a-world, inviting audiences to enter a realm of magic and fantasy and leave the theatre pondering “was it all a dream?”
# LewisUAchieve

## COORDINATING COMMITTEE

### Celebration of Scholarship 2017

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>Dr. Sarah Powers</td>
<td></td>
</tr>
<tr>
<td>Co-Chair</td>
<td>Dr. Erica Kwiatkowski-Egizio</td>
<td></td>
</tr>
<tr>
<td>Past-Chair</td>
<td>Dr. Joyce Hayward</td>
<td></td>
</tr>
<tr>
<td>Coordinating Sub-Committee</td>
<td>Dr. Ray Klump</td>
<td>Co-Chair, Abstracts</td>
</tr>
<tr>
<td></td>
<td>Dr. Dennis Cremin</td>
<td>Co-Chair, Abstracts</td>
</tr>
<tr>
<td></td>
<td>Syl Goyette</td>
<td>Member, Abstracts, Awards</td>
</tr>
<tr>
<td></td>
<td>Dr. Frank Rose</td>
<td>Member, Abstracts</td>
</tr>
<tr>
<td></td>
<td>Dr. James Rago</td>
<td>Co-Chair, Concurrent Sessions</td>
</tr>
<tr>
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<td>Dr. Betsy Wilber</td>
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