8:00 a.m. – 4:00 p.m.  | Posters on Display, Ballrooms A & B
9:00 a.m. – 11:00 a.m. | Poster Presentation Judging, Ballrooms A & B
9:00 a.m. – 12:30 p.m. | Oral Presentation Judging, Ballroom C
11:00 a.m. – 3:00 p.m. | Open Viewing for Campus Community, Ballrooms A & B
12:00 p.m. – 1:30 p.m. | Lunch for Student Presenters and Judges, Ballroom B
2:30 p.m. – 3:00 p.m.  | Awards Presentation, Ballroom B
3:00 p.m. – 4:00 p.m.  | Students Take Down Posters, Ballrooms A & B

Deans’ Choice Presentations
Harre Union Ballroom C
3:00 p.m. – 5:15 p.m.

<table>
<thead>
<tr>
<th>Time</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 p.m.</td>
<td>Mark Schwehn, Provost</td>
</tr>
<tr>
<td>3:10 p.m.</td>
<td>Cynthia Rutz, Director of the Celebration of Undergraduate Scholarship</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Ali AlNuaimi, Adam Berry, Courtney Brandt, Jesse Fosheim, Eric Loria, Jonathan Ogland-Hand, Andrew Schrader</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Ruyue Yuan</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>Jenessa Franco, Jacob Hoffman, Lily Salinas, Theresa Whalen, Jessica Coapstick, Ila Jackson, Graciela Payan</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>Kayla Nomina</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>Ruyue Yuan</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>Jonathan Mack</td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>Kaitlin Rogers, Heather Albertson, Mary-Ann Craft</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>Holly Griskell, Erin Harrington, Andrea Bretl, Emmanuel Bara-Hart, Nathaniel Terry, Amanda McCullough, Phuong Quynh Nguyen</td>
</tr>
</tbody>
</table>
# Oral Presentation Schedule

**Harre Union Ballroom C**

9:00 a.m. – 12:30 p.m.

<table>
<thead>
<tr>
<th>Time</th>
<th>Student Name(s)</th>
<th>Oral Presentation Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 a.m.</td>
<td>Jonathan Mack</td>
<td>Guardians or Traitors? A Study of the Jewish Pao Chia in Shanghai</td>
</tr>
<tr>
<td>9:25 a.m.</td>
<td>Laura Mattson</td>
<td>The Impact of China’s Investment in Nuclear Energy on the Reputation of Nuclear Power and the World’s Energy Supply</td>
</tr>
<tr>
<td>9:50 a.m.</td>
<td>Cui Cui</td>
<td>An Examination of Women’s Social Status and Knowledge Affecting the Child Mortality Rate in Ethiopia</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>William Scupham</td>
<td>Godly Brutality: The Cromwellian Conquest of Ireland, 1649-1650</td>
</tr>
<tr>
<td>10:35 –</td>
<td>10 MINUTE BREAK</td>
<td>10 MINUTE BREAK</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>Kayla Nomina</td>
<td>Patterns of the Past: Determining Common Pre-Genocide Characteristics to Predict and Prevent Future Genocides</td>
</tr>
<tr>
<td>11:10 a.m.</td>
<td>Lydia Hawkins</td>
<td>Doing Theology Through Discernment: An Analysis of Teresa of Avila’s Interior Castle</td>
</tr>
<tr>
<td>11:35 a.m.</td>
<td>Ruyue Yuan</td>
<td>“You Have Been God’s Grace to Me”: The Presence of Agape and Grace Outside Christianity in Marilynne Robinson’s <em>Gilead</em></td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Claire Simonpietri, Carly Crave, Christina Lundy, Jamielynn Tinkey</td>
<td>Beyond the Volcanoes: A Community Partnership for Health in Rural Nicaragua</td>
</tr>
</tbody>
</table>
Overview of the Celebration of Undergraduate Scholarship

The Celebration of Undergraduate Scholarship (CUS) is a conference that allows undergraduate students to showcase their creative and/or scholarly work and research in a professional format. The Celebration began in 1998 as an idea from an interdisciplinary group of faculty who had attended national meetings on the role of undergraduate research in the college experience.

One of the many joys of completing a research project or creative endeavor is to share the results with others. In a typical year, the Valpo CUS brings together more than 150 students and 45 faculty sponsors to share their research experiences with the campus and local community. Students who have worked on class projects, senior projects and theses, or independent scholarship are encouraged to participate. At the conference, all students present their work in a poster or oral presentation format. In addition to poster and oral presentations, the Deans of Valparaiso University’s five undergraduate colleges select students to represent their colleges at the Deans’ Choice Presentations, and these students give oral presentations in an afternoon program.

Students and faculty are encouraged to read the poster presentations guidelines and oral presentation guidelines on the Undergraduate Research website (http://valpo.edu/research/) for guidance on the development of their presentations. Faculty sponsors also provide guidance and support for their students, both in developing the original research and in transmitting that research to a poster or oral format.

Supporters of Valparaiso University’s Undergraduate Scholarship

The Valparaiso University Guild
Office of the Provost
Committee for Creative Work and Research
Valparaiso Institute of Teaching and Learning

Thanks to all who participated in the planning of this event.
“You Have Been God’s Grace to Me”: The Presence of Agape and Grace Outside Christianity in Marilynne Robinson’s *Gilead*

Ruyue Yuan

Many theologians traditionally claimed that only people who believe in God are able to love truly, for love comes as the result of receiving God’s grace. This implies that non-Christians fail to love truly due to their lack of faith. However, many contemporary theologians have found this account of non-Christians unsatisfying, as it seems to fall short of explaining the ethical force of non-Christian lives. Thus, a theological question arises as to whether or not God’s grace exists outside the church, enabling people to love authentically. Marilynne Robinson addresses this very question in *Gilead*. Robinson shows that an unbeliever Jack and his godfather and a church minister, John Ames, both experience love truly. Since agape comes to human beings as the result of receiving God’s grace, Robinson suggests that Jack has already obtained grace from God. She also indicates that the cause of Jack’s failure in his life is due to racism and social prejudice, not Jack’s lack of faith or the absence of God’s grace.

Furthermore, Robinson’s *Gilead* suggests that this broad understanding of Christianity helps Christians maintain and develop their faith in God while building a diverse religious community founded on respect and mutual understanding.

Information about the Author:
Ruyue Yuan became interested in the question of the presence of grace outside the church as it is one of the central questions that come up throughout the development of Christianity. She is a member of Christ College and the topic of religious studies has had a great influence in her spiritual experience. She is currently planning to go into academia for more research and hopes to become a college professor.

Faculty Sponsor: Dr. Edward Upton

Student Contact: ruyue.yuan@valpo.edu

#GunViolence #Chicago

Luetta Curtis

Departmental Affiliation: Art

#GunViolence #Chicago is a multimedia photo essay that examines the uncontrollable result of gun violence among Chicago’s minority youth. This essay explores how gun violence in Chicago impacts victims and their loved ones, and also how it initiates a never-ending cycle of revenge. Research includes visual documentation of areas where these types of violent acts happen, sound/audio interviews of victims and loved ones, and statistics of gun violence in Chicago. This essay seeks to answer why Chicago youth reengage in preventable gun violence.

Information about the Author:
Luetta Curtis is a senior art major from Chicago. Living in the same neighborhood all her life, she’s watched it turn from bad to worse. Growing up, she saw people engaged in gun violence and now the ones who are shooting are her age. The subject touches her because these are people that she once played with and considered her friends. She knows that there is more to life than killing each other, and she cares enough to share this work with the youth of Chicago.

Faculty Sponsor: Professor Liz Wuerffel

Student Contact: luetta.curtis@valpo.edu

“Col/Ler Number of Fruits per Main Stem” QTL Mapping

Elias Argueta, Ann L. Carlson, Hui Gong, Robert Swanson

Departmental Affiliation: Biology

Understanding fruit yield is important to the agricultural economy. The genetics of fruit production have not been fully defined for any plant. In order to identify the gene responsible for fruit production, we used a recombinant inbred line (RIL) population of plants from the species *Arabidopsis thaliana*. We counted the number of fruit on each line and an ANOVA was performed in order to calculate the heritability for fruit production. We will report on our composite interval mapping experiment using this data.
Information about the Authors:
This project was initially started by senior biology student Jasymn Madden. Elias Argueta decided to do research with Dr. Swanson because he knew that Dr. Swanson’s main research field is plant biology. Understanding fruit production can be such a great discovery since it could improve agriculture. This research also can be used to help underprivileged countries have a better food source. Ann L. Carlson helped with planting the seeds, and Dr. Hui Gong helped by doing an analysis and performing the ANOVA.

Faculty Sponsor: Dr. Rob Swanson

Student Contact: elias.argueta@valpo.edu

Defining the Genetic Basis for Seed Yield in Arabidopsis thaliana

David Goad, Ann Carlson, Hui Gong, Robert Swanson

Departmental Affiliation: Biology

Seed number per fruit is a vitally important trait because it determines total agricultural yield. Despite its importance, the genes that direct seed yield remain relatively unknown. We are using Recombinant Inbred Lines (RILs) in the weedy plant Arabidopsis thaliana to explore the heritability of seed yield and genetically map the genes responsible. Up to eight fruits were collected per plant from each RIL. Seeds were scanned using a flatbed scanner and counted using Adobe Photoshop CS6. With this data, we performed an ANOVA to calculate heritability, the amount of variance in the seed yield trait due to genetics. The heritability of seed yield was found to be 23.24 percent. Using the same data set, we are currently performing composite interval mapping to identify the genomic regions that contain the genes that direct seed yield, an analysis we will report on. Locating the genomic regions that contain seed yield is the first vital step in defining the gene network that directs seed number in fruit.

Information about the Authors:
David Goad is a senior biology major who has been working with Dr. Swanson for three years. For two of those years, the team worked to identify the genes responsible for non-random mating in Arabidopsis. Last fall, David switched to the current project to try his hand at genetic mapping. Next year, David will be attending Washington University in St. Louis to pursue a Ph.D. in Evolution, Ecology, and Population Biology.

Faculty Sponsor: Dr. Rob Swanson

Student Contact: david.goad@valpo.edu

Seed Dispersal of Native and Non-Native Fruiting Plants by Birds in Northwest Indiana Landscape

Kaitlin Rogers, Heather Albertson, Mary-Ann Craft

Departmental Affiliation: Biology

Birds disperse fruiting plants by feeding on fruits and later defecating whole intact seeds. Fruit-bearing non-native plants use this method to invade new habitats and may compete with native species for dispersal services. We studied the nature of this competitive interaction by examining the proportion of seeds in the fecal material of birds compared to the proportion of fruit available in the landscape. Sixteen fecal traps were placed in open fields surrounded by second growth vegetation at two study sites in Porter County, Indiana. A fecal trap consisted of a horizontal perch atop a 2m post placed out away from natural perch substrate and over a cloth sheet or plastic bin with protective hardware cloth screen to catch fecal material. Seeds from traps were identified and censuses of fruits available in the landscape were made along nearby field edges. While we found evidence of bird dispersal of non-native species, seeds of native species were much more prevalent in fecal material than expected from our census of fruits available, showing a clear preference by birds for several native species. Secondary seed predation did not appear to play a role in successful seed dispersal by birds in our study sites, as we did not find a significant difference between seed numbers collected on open sheets vs. protected collection bins that limited access by rodents or other birds. Our results show that having native vines and shrubs present in the landscape can reduce bird dispersal of non-native woody plants.

Information about the Authors:
Kaitlin Rogers is a senior biology/environmental science major interested in conservation and ecology. Heather Albertson is a senior biology/secondary education major also interested in ecology and large scale biological issues. Mary-Ann Craft is a senior biology/German major interested in the potential adaptations of local birds.

Faculty Sponsor: Dr. Laurie Eberhardt

Student Contact: kaitlin.rogers@valpo.edu
Heritability of Seed Size in Different Successions of Arabidopsis Thaliana

Emmily Shanks, Gerald Nwanne, Ann L. Carlson, Rob Swanson, Hui Gong

Departmental Affiliation: Biology

Seed size is an important aspect in agricultural development, yet the genotypic effects are poorly understood. Populations of seed from recombinant inbred lines from the species Arabidopsis thaliana were measured in order to perform an ANOVA and calculate broad sense heritability of seed size. One hundred seeds per plant were scanned and measured using the software Image J. The obtained calculations gave 50.59 percent of broad sense heritability. This data is currently being used to map the genes responsible for the phenotypic output.

Information about the Authors:
Emmily Shanks, Gerald Nwanne, Ann L. Carlson, Hui Gong, and Robert Swanson all contributed equally to this project.

Faculty Sponsor: Dr. Rob Swanson

Student Contact: emmily.shanks@valpo.edu

Application of Neurospora crassa in the Treatment of Waste

Matthew Przybyla, John Wunderlich

Departmental Affiliation: Biology, Chemistry

The nutrient requirements of the fast growing filamentous fungi Neurospora crassa to convert animal waste into an edible product containing high amounts of protein were assessed by selectively excluding nutrients from supplemental solutions of Vogel salts and trace elements added to the waste. When individual chemical components were omitted from the supplemental solutions, varying levels of growth were observed. However, there was no statistically significant difference. Similar results were obtained when groups of selected compounds were omitted from the supplemental solutions. Overall, these results suggest that the nutritional requirements for sustainably growing Neurospora crassa on animal waste may not be as stringent as anticipated. Therefore, commercial implementation of the Neurospora crassa project may be more achievable.

Information about the Authors:
Matthew Przybyla is majoring in biology as well as minoring in both chemistry and Chinese. Because of his educational background and interest in these three subjects, he seized the opportunity to work on and to extend his genetics professor’s research in not only the United States, but China as well. John Wunderlich is a senior majoring in biology with a chemistry minor. The research of Neurospora growth at Valparaiso University and Zhejiang University appealed to him because of his interest in biology, sustainable agriculture, and international science. He plans to continue pursuing a career in secondary education.

Faculty Sponsor: Dr. Michael Watters, Dr. Jon Schoer

Student Contact: john.wunderlich@valpo.edu

Molecular Hospitality: The Interactions of Brooker’s Merocyanine with Modified Cyclodextrins

Ben Averill, Kelsey Larson

Departmental Affiliation: Chemistry

The binding of a guest molecule to a host system occurs through weak molecular interactions instead of through the formation of chemical bonds. The relative strength of these interactions can be understood by comparing the binding constant in related host-guest systems. B-cyclodextrin (β-CD) is a seven-membered ring of glucose units which was used as the host molecule due to its basket-like shape. This shape allows Brooker’s merocyanine (BM), a highly conjugated guest molecule that is sensitive to its environment, to enter the cavity and interact with substituents located along the primary and secondary rims of the CD. This project measured the changes in the equilibrium binding constant due to different modifications to the CD, as well as the isomerization of BM within the cavity using UV-Vis and fluorescence spectroscopy. Binding constants were determined for different CD modifications, including β-CD, hydroxypropyl-β-CD, hydroxyethyl-β-CD, and sulfated β-CD (sodium salt). The largest effect of these substituents was the hindrance of the binding by the sulfate groups due to either steric effects or ionic interactions. A better understanding of these factors that affect binding and how molecules behave within the cavity will allow for more accurate predictions of their behavior under different conditions.
**Preparation of an Epoxide Precursor for Palladium-Catalyzed Trimethylenemethane Cycloaddition**

Chase Freeland, William Prusinski

**Departmental Affiliation:** Chemistry

In order to produce a highly functionalized five-membered ring useful for further synthetic processes via palladium catalysis, a series of precursors need to be synthesized in order to form the epoxide used in cyclic formation. First, a trimethylsilane alcohol is synthesized from beta-methallyl alcohol. The alcohol will then be subjected to Swern oxidation conditions, forming a TMS aldehyde. The aldehyde prepared will then undergo epoxidation, forming the desired precursor for Palladium catalyzed cycloaddition. These reactions occur in good conversion, and a good amount of epoxide is being amassed for use in the palladium-catalyzed cycloaddition research.

**Information about the Authors:**

No information provided.

**Faculty Sponsor:** Dr. Kevin Jantzi

**Student Contact:** chase.freeland@valpo.edu

---

**Spectrofluorometric Quantification of Optical Brighteners in Ambient Water**

Sean Kennedy

**Departmental Affiliation:** Chemistry

A spectrofluorometric method was established and used to detect and quantify optical brighteners (OB) in ambient water samples. Optical brighteners are added to products such as laundry soaps, detergents, and cleaning agents for the purpose of making the fabric appear brighter after washing. Because a large fraction of OBs are discharged into wastewater, they are ideal for use as indicators of failing septic systems, sewage leaks, or lack of wastewater treatment. The method described here uses moderately priced equipment to provide rapid and accurate detection of minute levels of contamination. Standard curves were prepared with disodium...
diaminostilbene disulfonate solutions ranging in concentration from 0.3 ppm to 70 ppm. Linear plots with R2 values of ≥ 0.987 were obtained for the standard curves, which were then used to determine the concentration of optical brighteners in water samples. 

Information about the Author:
Sean Kennedy is currently a senior with a major in chemistry and a dual minor in mathematics and human biology. He is interested in attending medical school in the future. He finds the topic very interesting because of the abundance of problems with water quality in the area. Water is the most important molecule, and improving the quality is necessary for the survival of ecosystems and communities all across the world.

Faculty Sponsor: Dr. Jon Schoer
Student Contact: sean.kennedy@valpo.edu

The Binding Affinity of Gas Molecules to the Heme Protein CooA

Jessica Lyza, Teryn Gerhed

Departmental Affiliation: Chemistry

This research aims to characterize the binding specificity of heme proteins to various gas signal molecules. Heme proteins in the gas-sensing family bind to specific gas signal molecules, causing a certain biological function to be activated or deactivated. In this study, variants of the carbon monoxide sensing heme protein CooA from the bacteria R. rubrum and C. hydrogenoformans are compared. Key differences in signal binding specificity and heme environment configuration will be investigated. This is done by using site-directed mutagenesis to alter the heme environment, isolating the CooA proteins through protein purification, and analyzing the isolated products through DNA binding assays. By manipulating the heme environment of these variants of CooA and comparing the signal binding specificity and activation to each other and to the wild type proteins, the basis of how CooA proteins are specifically activated by carbon monoxide is further explored.

Information about the Authors:
Teryn Gerhed is a senior biology and chemistry double major and is looking to attend graduate school for medicinal biology after graduating from Valparaiso. Jessica Lyza is a junior biochemistry major and is also looking to attend graduate school for medicinal biology after graduation. Both Jessica and Teryn are avid runners and play on the Women’s Ultimate Frisbee Team at Valpo.

Faculty Sponsor: Dr. Robert Clark
Student Contact: jessica.lyza@valpo.edu

Modification and Development of High-Performance Liquid Chromatography (HPLC) Experiments

Diandra Obermeyer

Departmental Affiliation: Chemistry

Two high-performance liquid chromatography (HPLC) experiments were developed for Quantitative Analysis (CHEM 230). The first modified an existing experiment by replacing acetonitrile with methanol in the mobile phase to reduce the associated costs and environmental hazards. In the second, a new biochemistry-specific HPLC experiment was developed. Biochemical samples were digested and the resulting polypeptides were separated and quantified by HPLC with UV-Vis detection. Adding a more biochemistry-related experiment to Quantitative Analysis will benefit the large number of VU students pursuing careers in health fields and biochemical research.

Information about the Author:
Diandra Obermeyer is a senior chemistry student. She has shown great interest in High-Performance Liquid Chromatography (HPLC) over the past year. HPLC is a very popular and common instrument used by chemists in the industrial field. This project was created when Diandra expressed her desire to increase her exposure to and experience with the instrument.

Faculty Sponsor: Dr. Jon Schoer
Student Contact: diandra.obermeyer@valpo.edu

Solar Hydrogen Production by Solar Thermal Decoupled Electrolysis: Analysis of Fe₃O₄ in Solution

Jordan Otto, Evan Beyers, Carol Larson, Jonathan Schoer, Robert Palumbo

Departmental Affiliation: Chemistry

The Valparaiso University Solar Research Project utilizes a solar thermal decoupled electrolysis process for the production of H₂ from water. This study
focuses on the electrochemical conversion of magnetite to hematite during the H₂ production process. Laboratory experiments show that the expected amount of H₂ gas forms at the cathode of the electrolytic cell, but we have encountered difficulties recovering the expected amount of solid hematite at the anode. An intensive study of the complex solution chemistry using cyclic voltammetry, Mössbauer spectroscopy, and solubility modeling showed that several dissolved iron species potentially exist in solution. Further work must be done to clarify which species are key participants in the overall electrochemical reaction. This information will help us to determine and implement reaction conditions that are favorable for precipitation of hematite or other oxidized iron species.

Information about the Author:
Jordan Otto is a junior biochemistry major. She plans to pursue graduate studies in biochemistry or organic chemistry after graduating from VU. Evan Beyers is a senior biochemistry major and will be attending Colorado State University for graduate studies in biochemistry and molecular biology this coming fall. Otto and Beyers presented their solar research at the 246th Annual American Chemical Society meeting held in Indianapolis last fall.

Faculty Sponsor: Dr. Robert Palumbo

Student Contact: jordan.otto@valpo.edu

Developing a Sensor to Detect Carbon Monoxide in Live Cells

Kedar Puvar, Edward Wetzel, Laura Rowe, Thomas Goyne

Departmental Affiliation: Chemistry

At low levels, carbon monoxide is known to serve as an important cellular signaling molecule. The study of carbon monoxide concentrations in living cells is very difficult, however, due to the lack of carbon monoxide sensors that are amenable to in vivo work. Proteins in certain organisms have the ability to bind the molecule carbon monoxide. One of these proteins is the CooA protein, which binds carbon monoxide very selectively in the organism R. rubrum. The CooA protein undergoes a large change in shape following the binding of carbon monoxide, and this project aims to develop a carbon monoxide sensor based on this CO-dependent conformational change in CooA. We mutated an amino acid in CooA so that a solvatochromic fluorophore can be attached to CooA. Solvatochromic fluorophores change color in different environments (polar versus non polar, for example). Therefore, once the solvatochromic fluorophore is attached to the CooA protein it will ‘glow’ one color when there is no CO around and will ‘glow’ another color when CO is present. This change in color will be due to the different environment that the fluorophore is exposed to following the shape change that CO binding initiates in CooA.

Information about the Authors:
Kedar and Eddie are both students in the Department of Chemistry's Biochemistry Lab. This lab provides students with the opportunity to work on an original research project during the semester. Both Eddie and Kedar are chemistry majors.

Faculty Sponsor: Dr. Laura Rowe

Student Contact: kedar.puvar@valpo.edu

Study of Ligand Binding Reactions of Bis-AmineMetalloporphyrins

Frank Wang

Departmental Affiliation: Chemistry

Porphyrins are molecular complexes that are critical for the proper functioning of many important biological macromolecules such as hemoglobin and myoglobin. The goal of this research is to monitor the transformations and differences that occur with the addition of metals and ligands to a model porphyrin compound called tetraphenylporphyrin (TPP). During this work, a series of metalloporphyrin complexes were prepared, with changes to both metal centers and ligand attachments at those centers. Specifically, iron, zinc, cobalt and manganese metalloporphyrins have been synthesized and identities verified via electronic absorption spectroscopy. Ligand binding studies have begun with the addition of piperidine and will continue with additional molecules such as pyrrolidine, imidazole, as well as secondary amines.

Information about the Author:
Frank is a senior biochemistry major who plans on attending graduate school followed by medical school after his time at Valparaiso University.

Faculty Sponsor: Dr. Steven Engerer

Student Contact: frank.wang@valpo.edu
Guardians or Traitors? A Study of the Jewish Pao Chia in Shanghai

Jonathan Mack

*Departmental Affiliation: Chinese and Japanese Studies*

This paper examines the nature of the Foreign Pao Chia, an organization started by the Japanese in 1942 and designed to police the Jewish refugee community living in Japanese-occupied Shanghai. The purpose of this research is to discover how the Jewish community viewed the organization and its members. I argue that because almost all young men in the refugee community were required to serve, the organization’s members generally had the best interests of the community – and not the Japanese – at heart, distinguishing the organization from similar groups active in Shanghai at the time. Although some have claimed that the organization was used to work against the refugees, I present evidence suggesting that most refugees eventually accepted the organization as a necessary protective measure, rather than a tool used by the Japanese against the Jews.

*Information about the Author:
Jonathan Mack is a junior accounting and Chinese and Japanese studies double major at Valparaiso University. He began studying the Foreign Pao Chia during a one month collaborative research project in Shanghai with Dr. Kevin Ostoyich, Dr. Yun Xia, and five other students from Valparaiso University. He is active in Asian studies-related campus programs, and plans to one day work as an accountant at an international firm.

*Faculty Sponsor:* Dr. Yun Xia

*Student Contact:* jonathan.mack@valpo.edu

The Impact of China’s Investment in Nuclear Energy on the Reputation of Nuclear Power and the World’s Energy Supply

Laura Mattson

*Departmental Affiliation: Chinese and Japanese Studies*

Over the past ten years, China’s involvement in nuclear power has increased dramatically. The country has seemingly unlimited resources to build nuclear power centers and has no qualms about using these resources. Because of this, China is the world’s fastest growing nuclear-energy competitor, with 20 reactors in operation and 28 currently under construction and they plan to build even more. While some countries are spurning nuclear energy for the currently low-priced natural gas, China is proceeding full force with the building of nuclear power plants, proclaiming that this is the solution to the widespread problem of pollution that exists in most of the country. Truly learning from the West, China has become completely self-sufficient in nuclear reactor design and construction, and is even able to vastly improve upon the current reactor plans. This heavy investment in nuclear power can be used as an example for the rest of the world to step away from dependence on fossil fuels as an energy source. Also, this increased involvement in the safe use of nuclear energy can help remove the bad reputation of this specific energy source.

*Information about the Author:
Laura Mattson is a senior majoring in physics and Chinese and Japanese studies with a minor in mathematics. She is also a member of Christ College.

*Faculty Sponsor:* Dr. Charles Schaefer

*Student Contact:* laura.mattson@valpo.edu

An Examination of Women’s Social Status and Knowledge Affecting the Child Mortality Rate in Ethiopia

Cui Cui

*Departmental Affiliation: Economics*

This project is an examination of what can affect the child mortality rate. The reason I chose Ethiopia is because in recent years Ethiopia has been improving in many different areas, including the child mortality rate. I thought women’s knowledge and social status could have a huge impact on this rate. Because of that, I used data sets from DHS Ethiopia 2011. I picked and computed six variables that I believe are closely related to women’s social status or knowledge and made them my regression. After running the regression on SPSS, there were a couple of shocking results, such as an increase in the child mortality rate for women with high levels of education. But women who have the ability to read can reduce the child mortality rate. I also found out that if a woman decides to breastfeed her child, this increases the child’s chance of survival. In the end, the model suggests that if the government wants to reduce child mortality, they should educate women about the importance of breast feeding and encourage them to read. A little knowledge can help them make better decisions about taking care of their children.
When Literacy Matters: A Study of the Impact of English and Local Language Literacy on Income in Ghana

Amanda McCullough

Departmental Affiliation: Economics

Ghana is a country with substantial language heterogeneity. In 2002, Ghana began a nationwide policy instituting English as the primary language of instruction in grade school. Using data from the Ghana Living Standards Survey, this paper examines the conditions (sectoral, geographic, educational attainment) in which English language literacy is, in fact, beneficial. Implementing a multinomial logit first stage to capture sector selection, this paper explores the interaction of sector and language on income in Ghana.

Information about the Author:
No information provided.

Faculty Sponsor: Dr. Sara Gundersen

Student Contact: amanda.mccullough@valpo.edu

Factors Influencing Fatal Car Accidents

Jessica Richardson

Departmental Affiliation: Economics

Fatal car accidents are all too common in the world today. There were 29,757 fatal car accidents in the United States in 2011. I used an ordinary least squares model and SPSS to produce a regression that explains the relation between multiple variables and the number of fatalities in an accident. Through my research, I hoped to gain insight as to what variables have the biggest impact on the number of fatalities, and what drivers can do to protect themselves each day from being killed while driving. Although there are many factors that influence fatal car accidents, choosing to wear a seat belt was the most crucial action in saving lives.

Information about the Author:
Jessica Richardson is an economics and mathematics major with a minor in business. She wanted to work on a project that combined mathematics and economics in a way that relates to the real world. As the daughter of a police officer and a nurse, she is very interested in finding ways to protect drivers from being involved in fatal accidents.

Faculty Sponsor: Dr. Sara Gundersen

Student Contact: jessica.richardson@valpo.edu

Up-Scaled Fish Barrier: Vertically Mounted Electrodes are Economical, Maintainable, Safe

Brandon Benninger

Departmental Affiliation: Environmental Science/Geography

Our Great Lakes are under attack by the invasive Asian carp. If they were to establish themselves in the lakes, it would prove detrimental to the ecosystem, the multi-billion dollar fishing industry, and recreational lake use. They become harmful airborne projectiles when disturbed by watercraft and will starve out native species. My focus is on the $200 million barrier system put in place to stop the migration of these fish. Currently, these fish are being stopped by a massive horizontal electrode fish barrier system located in Romeoville, Illinois. My research was spurred by the amount of problems with the maintenance of the system. Using horizontal electrodes makes them susceptible to damage and debris, mostly from barge chains and silt. The current maintenance protocol is to poison the water, shut down the barrier, and send a diver into potentially electrified water. I decided to try to model mounting removable electrodes on the side wall to stop the damage. I hypothesized that this would produce the same gradient and stop the fish. I created a 2 percent scale model of both configurations and tested the gradient using a volt meter. My findings show that vertically mounted electrodes will produce the same fish-stopping gradient, and are easier to maintain, safer, and more economical.

Information about the Author:
Brandon Benninger’s research has been on the barrier that is being used to stop the migration of Asian carp. He first improved the electrical gradient produced by the barrier. This project was awarded a finalist spot at the International Science and Engineering Fair.
He then redesigned the barrier to make it safer and easier to maintain. That project allowed him to advance to the Indiana Science and Engineering Fair. He was also awarded his first patent for the project. His research continued with a project that studied the effects of barge traffic on the electrical gradient of the barrier, which advanced him to the ISEF once again where he was awarded fourth place.

Faculty Sponsor: Dr. Bharath Ganesh Babu

Student Contact: brandon.benninger@valpo.edu

Mapping Tobacco Smoking Hotspots on the Valparaiso University Campus

Domenico Libreri

Departmental Affiliation: Environmental Science

Valparaiso University has been a tobacco-free campus since September 1993; however, smoking has not stopped. This is visibly evident from the smokers themselves along with the cigarette waste that can be seen outside of campus buildings. The focus of this study is to identify smoking 'hot spots' through a week-long survey of campus buildings by mapping their locations over a geographically referenced campus map. The ultimate goal of this study is to identify any significant spatial patterns or relationships between spatial and non-spatial attributes on the Valparaiso University campus.

Information about the Author:
Domenico Libreri is currently a junior majoring in environmental science. In the future, he wishes to find a career in waste management. He became interested in the topic because even though there is a large attempt to cease smoking on campus, it has evidently not had a large enough impact to stop it completely. With this study, he wanted to identify the primary places smokers congregate.

Faculty Sponsor: Dr. Bharath Ganesh Babu

Student Contact: domenico.libreri@valpo.edu

“Sounding” Like Lake-Effect Snow: Evaluating the Thermodynamic and Synoptic Setup of Northwest Indiana Lake-Effect Events Using Local Profiles and Numerical Modeling

Adam Brainerd, Russell Danielson, Kaitlyn Heinlein, Kevin Wagner, Kevin Goebbert

Departmental Affiliation: Geography and Meteorology

Lake-effect snow presents significant hazards for Northwest Indiana, which necessitates the need for accurate forecasts for these events. Recent radiosonde observations were taken routinely with radiosonde launches by Valparaiso University’s Aviation Team surrounding lake-effect events. From these soundings, thermodynamic environments are analyzed in conjunction with numerical simulations and official Green Bay soundings of 12 lake-effect precipitation events. This study will use the data from the sounding profiles and from numerical simulations to determine similarities and differences within the thermodynamic and synoptic environments surrounding these events. Through analysis of these pre-storm local environments, unique thresholds will be identified in environmental parameters associated with the setup and formation of lake-effect events over the southern Lake Michigan region. Creating a mean sounding for Northwest Indiana of these lake-effect setups would be optimal for aiding forecasts of similar future events. This analysis should allow observation of model biases and enhance the ability to predict lake-effect snow.

Information about the Authors:
This is a group of junior and senior meteorology students gaining experience in the field of research under the guidance of Professor Kevin Goebbert. In previous years, the Aviation Team from the Meteorology Department was provided a grant from MIT in order to launch radiosondes during icing and convective events in support of aircraft safety. Their efforts inspired the authors to use the data for a new research project that will focus on lake-effect snow environments, a challenging topic that is of primary interest to meteorologists forecasting for the Great Lakes Region. Exposure to the field of research through this project has provided the foundation for continuing our education through graduate studies.

Faculty Sponsor: Dr. Kevin Goebbert

Student Contact: russell.danielson@valpo.edu

Synoptic and Lake-Effect Classification of Snowfall in the Lake Michigan Region: Deriving Clarity Using WRF Simulations

Alex Caruthers, Ryan Connelly

Departmental Affiliation: Geography and Meteorology
Lake-effect snowfall in the area surrounding Lake Michigan often forms in the wake of a synoptic-scale system that also produces precipitation, making it difficult to differentiate lake-effect events from synoptic-scale system events. This differentiation is necessary in constructing a climatology of lake-effect snowfall events. As part of an ongoing project to construct a database of November lake-effect snowfall events in the regions surrounding Lake Michigan, simulations from the Weather Research and Forecasting (WRF) model are used to identify precipitation in ambiguous cases as either resulting from lake-effect snowfall or a synoptic-scale system. This unique database includes more than 900 events of either lake-effect or synoptic-scale precipitation from 1950-2012. Using NCEP/NCAR Reanalysis Project (NNRP) data, the WRF is run with 12 km grid spacing to create high resolution evolutions of weather patterns in the Lake Michigan domain for each precipitation event. The results of this study will serve as a useful foundation for the creation of a Lake Michigan regional November snowfall climatology and will aid in assessing multi-decadal trends in November lake-effect snowfall in this region. Three example cases will be presented to demonstrate how these simulations can be used to differentiate the otherwise ambiguous cases.

Information about the Authors:
The authors are a group of junior and senior meteorology students gaining experience in the field of research under the guidance of Professor Kevin Goebbert and Professor Craig Clark. Since lake-effect snow impacts Valparaiso University, having the opportunity to research the phenomenon in-depth has been invaluable. Each author is interested in continuing his education to the graduate study level within the atmospheric science realm.

Faculty Sponsor: Dr. Kevin Goebbert

Student Contact: alexandra.caruthers@valpo.edu

Interannual and Seasonal Variability of Tropical Cyclone Genesis in the Northwest Australia Basin

Eleanor Delap, Nathan Kelly, Mallory Row, Zachary Sefcovic, Kevin Goebbert

Departmental Affiliation: Geography and Meteorology

Common genesis regions for Tropical Cyclones (TCs) worldwide have been identified, but TC genesis in the Northwest Australian Basin (NWAUS) has not been thoroughly studied. Studies conducted in other TC basins show distinct trends in spatial and temporal patterns of TC genesis, but these trends are largely unknown in the NWAUS. The analysis begins by describing the spatial and temporal distribution of TC genesis points for the region. Then statistical correlations are calculated to connect specific genesis regions, in both space and time, to atmospheric teleconnection patterns such as the IOD, ENSO and NAO. In addition, statistical correlations between TC genesis points and NCEP/NCAR reanalysis variables, air temperature, geopotential height, and u and v wind components will also be investigated. By identifying common genesis areas and their links to atmospheric variables, the goal is to develop new and useful TC forecasting tools for the region.

Information about the Authors:
The authors are a group of junior and senior meteorology majors with support from Dr. Kevin Goebbert, Assistant Professor of Meteorology. This project was driven by each student’s ambition to learn more about tropical meteorology and desire to conduct scientific research in a group setting. Each author is interested in pursuing higher education beyond an undergraduate degree in atmospheric or related science.

Faculty Sponsor: Dr. Kevin Goebbert

Student Contact: mallory.row@valpo.edu

Synoptic and Lake-Effect Classification of Snowfall in the Lake Michigan Region

Eleanor Delap, Sarah Fingerle, Kaitlyn Heinlein, Allison Young, Craig Clark

Departmental Affiliation: Geography and Meteorology

This research is part of a broader project that explores the role of Lake Michigan in its regional climatology. Since 1950, the wintertime temperatures have risen, but snowfall amounts have stayed constant. This study explores snowfall events in October and November to see the role that early lake-effect snow has on the constant yearly snowfall average, as well as to see which areas around the lake are most impacted by lake-effect snow. In order to understand the role of lake-effect snow in the regional climatology, this study used the daily weather map archive to focus on the overall synoptic-scale pattern for each event. Through analysis of reported snow since 1950, the type of snowfall, either synoptic or lake-effect, has been categorized for the whole region. The six sub-regions surrounding Lake Michigan were also individually categorized. This research utilized statistical correlations to learn more
about the distribution of synoptic versus lake-effect snow in each sub-region. By understanding the role of lake-effect snow in the regional climatology, improved forecasting tools for the Lake Michigan region can be created.

Information about the Authors:
The authors are a group of junior and senior meteorology students gaining experience in the field of research under the guidance of Professor Craig Clark. Since lake-effect snow impacts Valparaiso University, having the opportunity to research the phenomenon in-depth has been invaluable. Each author is interested in continuing his or her education at the graduate level.

Faculty Sponsor: Dr. Craig Clark

Student Contact: allison.young@valpo.edu

Exploring Patterns in November Snowfall Using GIS Mapping and Analysis

Dana Koning, Alex Carne, Bharath Ganesh Babu

Departmental Affiliation: Geography and Meteorology

A Geographic Information System (GIS) analysis was generated to examine patterns in November snowfall climatology for 47 observing stations surrounding Lake Michigan. Snowfall data compiled for each year from 1950 to 2012 was mapped using an interpolation method called kriging, which is a spatial analyst tool. Some of the data mapped includes average snowfall for the Lake Michigan region, number of days with measurable snowfall, number of days with snow on the ground, and correlation between snowfall and temperature. Overall, these maps show maximums in north-central and southwestern Michigan decreasing to the south, as expected. The first three loadings of principal component analysis were also mapped using the same data. Principle Component 1 (PC1) explains most of the data variance and shows that northern and southwestern Michigan do not correlate with areas on the western side of the lake, illustrating that the amount of snow that northern Michigan receives doesn't correspond to the amount of snow that Chicago receives and vice versa. Once this primary pattern is captured, the second principal component shows an inverse relationship between the main NW and SW lake-effect regions in Michigan and the third principal component reflects the influence of snowfall from synoptic systems NW of Lake Michigan.

Information about the Authors:
Dana Koning is a senior meteorology major who loves all types of weather, but has had a particular affinity for snow since she was young. Dana was excited to be able to use her knowledge of GIS to analyze snowfall patterns and correlation to temperature. In the future, she would like to further her knowledge of GIS and apply those skills to other aspects of meteorology. After graduation, Dana hopes to find a job utilizing her degree in the private or public sector. Alex Carne is a junior meteorology major who has had a passion for weather throughout his whole life. Through the years, he has gained a great interest in winter weather and snow, leading him to take on the challenge of a lake-effect snow research project. He learned how to use GIS and helped to create various maps of lake-effect snow patterns across the Lake Michigan region. After graduation, Alex hopes to attend graduate school, and ultimately aspires to have a career in either operational forecasting or research meteorology. Dr. Bharath Ganesh Babu is a GIS professor in the Geography and Meteorology Department. He assisted Dana and Alex in overcoming any issues they came across with the ArcGIS software and creating a geodatabase that would be compatible with their data.

Faculty Sponsor: Dr. Bharath Ganesh Babu

Student Contact: dana.koning@valpo.edu

Exploration of Synoptic-Scale Patterns in Early-Season Snowfall around the Lake Michigan Region

Andrew VanDe Guchte, Zachary Sefcovic, Kevin Goebbert, Craig Clark

Departmental Affiliation: Geography and Meteorology

This research is part of a broader project that explores the role of Lake Michigan in the regional snowfall climatology. This study explores the statistics of snowfall through the month of November in the Lake Michigan region. Each November snowfall event was classified by whether it was a synoptic event or a lake-effect snow event. From these classifications, a table of dates and snowfall statistics were compiled for Lake Michigan snowfall events from 1950 to 2012. This table was used in coordination with NCDC netCDF re-analysis files to find relationships between the type of the event and 850-hPa, 500-hPa, and 300-hPa temperature, height, wind speed, and wind direction. In order to further understand the climatological development of the snow events
around Lake Michigan, composite datasets were also assembled and analyzed. By doing this, the “mean-state” of lake-effect and synoptic snow events around Lake Michigan can be studied. Additionally, the variance between the two modes of snowfall can be statistically analyzed.

Information about the Authors:
Andrew VanDe Guchte and Zachary Sefcovic are two senior meteorology students gaining experience in the field of research under the guidance of Professor Craig Clark. Since lake-effect snow impacts Valparaiso University, having the opportunity to research the phenomenon in-depth has been invaluable. Each author is interested in continuing his education to graduate-level study within the atmospheric science realm.

Faculty Sponsor: Dr. Craig Clark
Student Contact: andrew.vandeguchte@valpo.edu

Forecasting and Intercepting the 28 May 2013 Bennington, KS Tornadic Supercell: A Student Perspective

Kevin Wagner

Departmental Affiliation: Geography and Meteorology

This project examines the 28 May 2013 mesoscale case over north-central Kansas and focuses on the step-by-step process from a student perspective. The project describes the tools, models, parameters, and observations used to determine the focus for the day, including a classic loaded-gun sounding measured and observed by the field team. The decisions made by the team on this day placed them in position to observe an EF-3 tornado near Bennington, Kansas. The main goal of the project is to educate students about how to forecast and safely observe severe weather events through a how-to-guide compiled from experiences in the Valparaiso University Meteorology Department program, Severe Convective Storms Field Study. The project will demonstrate how to apply the knowledge from the course to a real-time, in the field, forecast. Although forecasting is not an exact science just yet, the guide will help educate future students and others on how to utilize various tools and techniques in order to accurately forecast for convective weather.

Information about the Author:
For the past 20 years, undergraduate students in the Valparaiso University Meteorology Department program, Severe Convective Storms Field Study, have ventured into the field and applied their classroom knowledge in a hands-on environment. The students collect data, forecast, and discern target areas for severe weather. When conditions allow, the students prepare and launch radiosondes in the pre-storm environment.

Faculty Sponsor: Dr. Bart Wolf
Student Contact: kevin.wagner1@valpo.edu

The Spread of Country Music to an Urban Setting Seen Through the Spread of Dance Halls

Karl Walsh

Departmental Affiliation: Geography and Meteorology

Country music has become one of the most popular genres of music in today’s world. A genre that grew out of the rural societies of America, its popularity has spread into the urban setting and has influenced social life there as well. This poses a question about whether country music has become more popular in an urban/suburban setting versus a rural setting. There has been a large increase in country music's popularity in an urban setting and it is where the genre is becoming more popular. The spread of country music will be represented by country music dance halls and their proximity to city centers. The data will be collected using primary literature and country music dance hall databases. Results will be displayed using GIS software to show whether dance halls are more popular in an urban or rural setting.

Information about the Author:
No information provided.

Faculty Sponsor: Dr. Michael Longan
Student Contact: karl.walsh@valpo.edu

Analysis of Monthly, Seasonal, and Yearly Wind Flow Over the Ometpe Island in Lake Nicaragua

Allison Young, Ricky Cody, Adam Brainard

Departmental Affiliation: Geography and Meteorology

The health issues on the Ometpe Island in Lake Nicaragua are directly influenced by the open-pit fires inside of homes on the island and the particulates they produce. Understanding the prevailing wind patterns of the area would result in
better advice for local homeowners on how to foster natural air flow through their homes and minimize the concentrations of trapped particulates. The purpose of this study is to identify prevailing wind patterns over the island in the monthly, seasonal, and yearly time frames. Due to the limited observations in the island area, the Weather Research and Forecasting model (WRF) was run at 1.33 km grid spacing, focusing on the area around the island to verify the small existing data set. Because of the verification, WRF simulations were used for an analysis of average wind direction and speed in the hopes of finding common, predictable wind patterns in the simulated data set. It is hypothesized that the most variation will occur between wind speed and direction in the wet and dry seasons, as the Intertropical Convergence Zone (ITCZ) will migrate southward into the area. With these useful climatologies, individuals in the local area should be able to create a mechanism to maximize awareness of how to properly foster natural cross-breeze ventilation.

Information about the Authors:
This inter-disciplinary project proposed in Prof. Kevin Goebbert’s spring 2014 research class has been researched by junior and senior meteorology majors. For the last 20 years, the VU College of Nursing has been visiting Ometepe Island in order to further their nursing proficiency. In recent years, the Chemistry and Meteorology Departments have been working with the traveling nursing students in the hopes of determining the causes of the respiratory problems that the islanders face. By utilizing the technological resources of VU’s weather center and Geographic Information System (GIS) lab, applicable results are ensuring that islanders will be able to better understand their immediate environment through informational literature. The Meteorology Department hopes to continue their presence in the island area to ensure the longevity of their partnership with the Nursing and Chemistry Departments and to foster new partnerships with engineering students in developing cleaner indoor technologies.

Faculty Sponsor: Dr. Kevin Goebbert

Student Contact: allison.young@valpo.edu

Patterns of the Past: Determining Common Pre-Genocide Characteristic to Predict and Prevent Future Genocides

Kayla Nomina

Departmental Affiliation: History

Certain warning signs of genocide – segregation, identification symbols, dehumanization, death lists, and executioners-in-training – existed in Nazi-controlled territories prior to the extermination of the Jews. Can these signs be seen in all past genocides? And, if so, can this pattern be effectively utilized to predict and prevent future genocides? By comparing pre-genocide characteristics that warned of the Armenian genocide, the Holocaust, and the Rwandan genocide, one can indeed see that these are common characteristics of a country on the verge of genocide. As Gregory H. Stanton has theorized, there are common “stages” in the genocidal process, each with distinct characteristics signaling what is to come. This can be proven by a careful examination and comparison of how the three previously listed genocides moved through Stanton’s stages. Understanding this process is currently of great importance. By recognizing the early signs of past genocides, the international community can identify countries currently nearing genocide and, with enough political and public will, pursue proactive prevention before more innocent lives are lost.

Information about the Author:
Senior Kayla Nomina is a member of the International Association of Genocide Scholars and has been studying genocide for several years. She presented a different paper on the Rwandan genocide at the University of Minnesota in April. She hopes to work for a non-profit organization or a genocide museum where she can increase awareness of genocide and contribute to the effort to prevent this crime in the future.

Faculty Sponsor: Dr. Kevin Ostoyich

Student Contact: kayla.nomina@valpo.edu

Godly Brutality: The Cromwellian Conquest of Ireland, 1649-1650

William Scupham

Departmental Affiliation: History

Irish nationalist historians resoundingly paint Oliver Cromwell as a genocidal madman, much to the detriment of Anglo-Irish relations. However, when one dares to reevaluate Cromwell’s 1649 invasion of Ireland, one begins to question one’s long-held prejudices toward “God’s Executioner.” Cromwell’s cause was not one of genocide, but of military necessity. Analysis of the campaign, and of the infamous sieges and massacres at Drogheda and Wexford that defined it, shows that the myth of Cromwellian war crimes ignores the seventeenth
Information about the Author:
Will Scupham is a senior history and political science double major and a member of Phi Mu Alpha Sinfonia from Valparaiso, Indiana. He has an extensive background in researching military history and wrote this particular paper for his history senior seminar class.

Faculty Sponsor: Dr. Colleen Seguin
Student Contact: william.scupham@valpo.edu

The Comparison between Intensive and Standard Physical Therapy after Reconstructive Knee Surgery

Selina Hodogbey

Departmental Affiliation: Kinesiology

The purpose of this study is to identify which method of physical therapy after reconstructive knee surgery is the most effective and why. The results of this study may be very beneficial for physical therapists in the decision-making process for therapies. Twelve different studies focusing on knee surgeries and/or rehabilitation after reconstruction will be analyzed. A comparison between intensive and standard physical therapy will be made. Results, conclusions, and recommendations are being drawn at this time.

Information about the Author:
For the past few years, Selina Hodogbey noticed several knee injuries during basketball games. Some of those injured athletes, after physical therapy, tend to become injured in the same manner or play differently. For that reason, she became interested in finding reasons why. She thought that the reason must be in the type of physical therapy or surgery that they are receiving. She wants to become a physical therapist someday, so she feels it’s only fitting to investigate rehabilitation methods.

Faculty Sponsor: Dr. Kelly Helm
Student Contact: selina.hodogbey@valpo.edu

Hydration Patterns in Division I Football Players in Pre-Season Training Camp

Noah Neuenfeldt

Departmental Affiliation: Kinesiology

Proper hydration during vigorous intense exercise is important to maintaining optimal performance. Without proper hydration, the body cannot cool off heated muscles in a hot and humid environment. This study attempts to discover if the Valparaiso University football team is properly hydrated during pre-season training in a hot and humid environment. Participants included 102 football players who participated in 16 total practices. Data consisted of pre- and post-weigh-ins for each athlete for every practice. Sixty-five of the athletes completed questionnaires, which were created to discover the athletes’ knowledge of hydration. Results indicated that a significant amount of players were dehydrated enough to impact performance. A frequency distribution was used to analyze the percentage of weight loss by each participant for every practice. A frequency distribution was used to analyze the questionnaire. The major findings from the questionnaire indicated that 67 percent of the participants did not think that they hydrated enough and that the coaches did not allow enough time to hydrate. The results of the study suggest two things: (1) That 84 percent of the football players experience fluid loss of at least 1 percent of their body weight, and (2) that 67 percent of Division I football players should be hydrating more.

Information about the Author:
Noah Neuenfeldt became interested in exercise physiology at an early age. He was heavily involved in athletics in high school and continued that involvement in college. He is particularly interested in the body’s adaptations to exercise, both acutely and chronically. Noah will be pursuing a master’s degree in exercise physiology in the fall of 2014 and plans on becoming a certified strength and conditioning specialist at the end of May.

Faculty Sponsor: Dr. Kelly Helm
Student Contact: noah.neuenfeldt@valpo.edu
The Psychological Parameters and Sports-Related Injuries of Female Collegiate Athletes

Courtenay Stewart

Departmental Affiliation: Kinesiology

Athletic injury is a common occurrence and a concern for those who participate in sports. The past 15 years has produced a substantial body of literature confirming that psychological factors play a significant role in sports injuries. Many athletes devote years to practice in order to perfect their talents and even a minor injury can have a major impact resulting in physical pain and also psychological suffering. The purpose of this study is to determine if psychological parameters previous to injury had any impact on injury in female collegiate athletes. Participants in this study are female athletes from various teams at Valparaiso University. These participants completed five different questionnaires. The first questionnaire was an injury report. The other four questionnaires are psychological scales including: The Life Events Coping Scale for Collegiate Athletes (LESCA), The Social Anxiety Scale (SAS), The Athletic Coping Skills-28 Scale, and The Sport Competition Anxiety Test (SCAT). At this time, data collection and analysis continues. From this study, the author hopes to find psychological parameters that may be helpful in predicting future injury in female athletes.

Information about the Author:
Courtenay Stewart is an exercise science major with minors in human biology and psychology. She is planning on attending graduate school to earn a master’s degree in sports psychology and a doctorate in physical therapy.

Faculty Sponsor: Dr. Kelly Helm

Student Contact: courtenay.stewart@valpo.edu

Strengthening Your Hip Muscles: Some Exercises May Be Better Than Others

Amanda Ulin, Kelsey Draper, Kaylee Draper

Departmental Affiliation: Kinesiology

Weak hip muscles lead to poor hip motion, and poor hip motion can cause knee, hip, and back pain. Strengthening hip muscles that control how hips move may reduce pain in these parts of the body. This undergraduate research project compared hip abductor muscle activity during selected exercises using electromyography in order to determine which exercises are best for activating the gluteus medius and the superior portion of the gluteus maximus, while minimizing activity of the tensor fascia lata. Participants in this study included nine healthy female soccer players between the ages of 18 and 21. Using an electromyogram (EMG), the muscle activity of the nine subjects was recorded during the following 11 exercises: hip abduction in sidelying, clam with elastic resistance around thighs, bilateral bridge, unilateral bridge, hip extension in quadruped on elbows with knee extending, hip extension in quadruped on elbows with knee flexed, forward lunge with erect trunk, squat, sidestep with elastic resistance in a squatted position, hip hike, and forward step-up. At this time, data collection and analysis continues; however, it is hypothesized that both gluteal muscles were significantly more active than the TFL in unilateral and bilateral bridging, quadruped hip extension, the clam, sidestepping, and squatting.

Information about the Authors:
Amanda Ulin is a senior from Solon, Iowa, majoring in biology and minoring in exercise science and psychology. She will pursue a doctorate degree in physical therapy at the University of Iowa this fall. Kelsey and Kaylee Draper are juniors from Perrysburg, Ohio. They are both majoring in biology with minors in chemistry and psychology. After graduating in May 2015, they plan to pursue a master’s degree in physician assistant studies.

Faculty Sponsor: Dr. Kelly Helm

Student Contact: amanda.ulin@valpo.edu

Compactly Arranging Every Way of Filling an L-Shaped Grid into a Non-Repeating Array

Rachel Rockey

Departmental Affiliation: Mathematics and Computer Science

A de Bruijn Array (also called a torus) is a toroidal array of numbers where each filling of an m-by-n matrix, with digits chosen from 0 to k-1, is present only once. While it is well understood how to find a de Bruijn Array for fillings of an m-by-m rectangle (Jackson, Stevens, Hurlbert, 2009), arrays for other shapes are unstudied. I have worked to answer the question: can de Bruijn Arrays be found with different shapes of fillings? In particular, I have considered The L Problem. Instead of arranging fillings of a rectangular grid, this problem arranges fillings of a 2-by-2 grid with one square removed. I have proven that a de Bruijn Array does exist for
Probabilistic Analysis of the Economic Impact of Earthquake Prediction Systems

Ruyue Yuan

Departmental Affiliation: Mathematics and Computer Science

This research initiates from the question of whether or not earthquake prediction systems are actually worth investing in, as the cost of operating such systems is quite large compared to the number of lives which may be saved and, furthermore, false predictions may cause large-scale public panics and substantial economic losses. Some argue that it is more effective to invest in the research and development of infrastructure which can withstand earthquakes, rather than trying to predict earthquakes before they happen. Improving upon previous research on earthquake prediction systems, we use probabilistic methods to model the expected cost per life saved from a prediction system. The result is applied numerically to the San Francisco Bay area and the expected cost per life saved from the earthquake prediction system is found to be $2.5 million in the case of a magnitude 8+ earthquake. While the amount is quite high, it is substantially lower than the corresponding expected cost per life saved of $6.3 million from expenditures in earthquake engineering to improve building codes.

Information about the Author:
Ruyue Yuan is a junior mathematics major and a member of Christ College. She is involved in many academic research projects and is planning on pursuing further education in math. This project on earthquake prediction systems is a topic that involves both theoretical math problem-solving methods and realistic applications, which she has found most appealing in her research experience.

Faculty Sponsor: Dr. Tiffany Kolba
Student Contact: ruyue.yuan@valpo.edu

Surface-Dependence of Interfacial Binding Strength between Zinc Oxide and Graphene Investigated from First Principles

Allyse Appel, Adam Clark, Kelsey Larson, Haiying He, Stan Zygmunt

Departmental Affiliation: Physics and Astronomy

There is an increasing interest in hybridized materials for applications such as improving the structural integrity of known and commonly used materials. Recent experiments have suggested that the adhesion of zinc oxide (ZnO) nanowires with carbon fibers can significantly improve the interfacial shear strength of fiber-reinforced composites. We have carried out a systematic study of the interaction between ZnO and graphene based on density functional theory, with a focus on the effect of the surface orientation and termination of ZnO. The most thermodynamically stable hexagonal phase of ZnO is modeled by a cluster with (001), (100), and (110) facets, and the (001) surface is constructed to have both Zn-rich and O-rich terminations. The interaction has been explored through varying both the orientation and the binding sites of the interacting surfaces. The interfacial binding strength is calculated by scanning the potential energy surface while bringing the ZnO cluster incrementally closer to graphene. Results from these energy scans will be presented and discussed along with simple physical arguments to rationalize the observed behavior.

Information about the Authors:
This semester, the authors had the unique opportunity to partake in a computational physics research class (PHYS-492) offered by Prof. Zygmunt and Prof. He. Over the course of this project, the authors developed modeling and computer programming skills that will come in handy for future graduate studies and explored the less familiar realm of chemical physics. Having previous research experience, each author was able to bring a different piece of knowledge to this project. Allyse Appel is a junior physics major with a concentration in astrophysics and has previously worked with modeling systems; Adam Clark is a junior physics/math double major who has a strong interest in nuclear physics and a background in computer programming; Kelsey Larson is a junior chemistry/physics double major who has a background in physical chemistry and an interest in the dynamics of molecular systems.
A Long-Term Variability Study of Dying Low and Intermediate Mass Stars

Allyse Appel, Justin Reed

Departmental Affiliation: Physics and Astronomy

We are studying the long-term light variation of dying stars (similar to that of our Sun). These stars pulsate, which causes them to vary in light. Our purpose is to better understand the internal structure of these objects through the analysis of light curves to determine the periodicity of each object. These dying stars are in the proto-planetary nebula (PPN) phase, which lasts only a few thousand years between the red giant phase and the planetary nebula phase. First discovered with the Infrared Astronomical Satellite Survey in 1983, PPN emit strongly in the infrared, but the central stars of PPN can be studied in visible light. This summer we have observed for 20 nights from the Valparaiso University Observatory gathering data for 26 stars.

Information about the Authors:
Allyse (Allie) Appel is currently a junior physics major. Her long-term goal is to go to graduate school, possibly receiving a Ph.D. in particle physics or astrophysics as well as to participate in research for the United States. Justin Reed is currently a sophomore physics major, unsure of future career plans. Both students are first-year astronomy research students working with Dr. Bruce Hrivnak.

Faculty Sponsor: Dr. Bruce Hrivnak

Student Contact: allyse.appel@valpo.edu

The Effect of Lightning on Tropospheric Ozone Concentrations over Valparaiso, Indiana in 2006 and 2007

Abby Kenyon, Kevin Wagner, Molly Becker

Departmental Affiliation: Physics and Astronomy

Ozone (O3) is a well-known greenhouse gas that plays an important role in our atmosphere. The highest concentrations of O3 occur in the stratosphere, but O3 can also be found in smaller concentrations in the troposphere. Tropospheric O3 can result from multiple processes, such as subsidence from the stratosphere or photochemical production resulting from emissions of precursors at or near the surface. O3 can also be produced throughout the troposphere in conjunction with or as a direct result of lightning. In the years 2006 and 2007, 30 weather balloons were launched from Valparaiso, Indiana to measure O3 concentrations in the troposphere. Using archived radar, satellite, and surface observation data, we identified several of these dates on which convective weather capable of producing lightning passed over Valparaiso. We connect the lightning strikes from the World Wide
Lightning Location Network (WWLLN) with observed enhancements in O₃ as detected by instruments on the Valparaiso weather balloons using modeled air mass trajectories and estimate the fraction of observed O₃ resulting from lightning production.

Information about the Authors:
Abby Kenyon, Molly Becker, and Kevin Wagner are meteorology students who conducted this project under the advising of Professor Gary Morris of the Physics and Astronomy Department. Junior Abby Kenyon plans to continue her education in atmospheric sciences through graduate school. She hopes to conduct further lightning-based research. Senior Molly Becker hopes to continue her research after school and work with fellow meteorologists on lightning studies. Senior Kevin Wagner wanted to broaden his research experience in the atmospheric sciences and will continue his studies after graduation.

Faculty Sponsor: Dr. Gary Morris
Student Contact: abby.kenyon@valpo.edu

A First-Principle Study of Small Neutral and Anionic Silver Halide Clusters
Erik Langholz, Stephen Place, John Eric Tiessen, Haiying He, Stan Zygmunt

Departmental Affiliation: Physics and Astronomy

Silver halide is a material that was traditionally used in photographic films. In recent years, there has been a revived interest in using small clusters of silver halides for photocatalytic and photovoltaic applications. We present the results of a theoretical study of neutral and anionic AgₙXₙ (X = F, Cl, and Br, and n = 1-6) clusters. Quantum-mechanical calculations were performed using Density Functional Theory (DFT) in search of the lowest-energy isomers of the neutral and anionic clusters with applied symmetry constraints. The optimal configurations are compared across the series of AgF, AgCl, and AgBr. The variation in binding energies, bond lengths, charge distributions, HOMO-LUMO gaps, and electron affinities will be discussed as a function of cluster size and composition. The study of these clusters allows us to gain a better understanding of the structure and function of these materials in current and future applications.

Information about the Authors:
John Eric Tiessen is currently a physics major at Valparaiso University. He plans on going to graduate school after completing his undergraduate degree and would like to go into computational work. Stephen Place is a sophomore physics major from Goshen, Indiana. Stephen intends to pursue graduate school after graduation. Erik Langholz is a sophomore mechanical engineering major from Kaiserslautern, Germany. Upon graduating, Erik plans to either become a pilot in the U.S. Air Force or go to graduate school for engineering or applied physics.

Faculty Sponsor: Dr. Haiying He, Dr. Stan Zygmunt
Student Contact: erik.langholz@valpo.edu

Compatibility of Photomultiplier Tube Operation with SQUIDs for a Neutron EDM Experiment
Matthew Libersky

Departmental Affiliation: Physics and Astronomy

An experiment at the Spallation Neutron Source at Oak Ridge National Laboratory with the goal of reducing the experimental limit on the electric dipole moment (EDM) of the neutron will measure the precession frequencies of neutrons when a strong electric field is applied parallel and antiparallel to a weak magnetic field. A difference in these frequencies would indicate a nonzero neutron EDM. To correct for drifts of the magnetic field in the measurement volume, polarized Helium-3 will be used as a comagnetometer. In one of the two methods built into the apparatus, superconducting quantum interference devices (SQUIDs) will be used to read out Helium-3 magnetization. Photomultiplier tubes (PMTs) will be used concurrently to measure scintillation light from neutron capture by Helium-3. However, the simultaneous noise-sensitive magnetic field measurement by the SQUIDs makes conventional PMT operation problematic due to the alternating current involved in generating the high voltages needed. Tests were done at Los Alamos National Laboratory to study the compatibility of simultaneous SQUID and PMT operation, using a custom battery-powered high-voltage power supply developed by H.O. Meyer and P.T. Smith to operate the PMT. The results of these tests will be presented.

Information about the Author:
Matthew Libersky is a sophomore physics and electrical engineering major who became interested in the experiment from discussion with a VU professor due to its relevance in testing theories of physics beyond the Standard Model and the useful practical skills involved in the work. He will continue work on a related project this summer. He plans to
pursue graduate study in physics and hopes to work as a research scientist in experimental physics.

Faculty Sponsor: Dr. Shirvel Stanislaus

Student Contact: matthew.libersky@valpo.edu

Measuring Azimuthal Angular Resolutions in $p^+p \rightarrow jet + X$ and $p^+p \rightarrow jet + \pi\pm + X$

Jacob Long

Departmental Affiliation: Physics and Astronomy

Measurements of particle production from polarized-proton collisions at Brookhaven National Laboratory's Relativistic Heavy Ion Collider (RHIC) give insight into proton spin structure. One way to study spin effects such as those due to quark transversity or the Sivers parton distribution function is to analyze spin-dependent asymmetries in the final-state particles produced in transversely polarized-proton collisions. The large angular acceptance of the Solenoidal Tracker at RHIC (STAR) allows the reconstruction of full jets in addition to inclusive hadron production. Analyzing spin-dependent azimuthal asymmetries in $p^+p \rightarrow jet + X$ (e.g. Sivers Mechanism) and $p^+p \rightarrow jet + \pi\pm + X$ allows one to isolate contributions from the Sivers and Collins effects. Measuring the resolution of the relevant azimuthal angles is critical to quantifying the systematic uncertainties of the asymmetry measurements. A useful means to study the resolutions and response of the STAR detector in light of pile-up backgrounds is to embed simulated events into real zero-bias data. In 2009 and 2011, STAR collected data from polarized-proton collisions at $\sqrt{s} = 500$ GeV. These samples provide an opportunity to study the angular resolution of inclusive jets at 500 GeV from embedded simulated events, and the progress of these studies will be shown.

Information about the Author:
Jacob Long is a graduating senior physics major seeking admittance to graduate school with the intent of obtaining a Ph.D.

Faculty Sponsor: Dr. James Drachenberg

Student Contact: jacob.long@valpo.edu

Measuring Quantum Conductance in Gold Nanowires

Jacob Long

Departmental Affiliation: Physics and Astronomy

The purpose of this project is to observe and measure quantum conductance in gold nanostructures. Conductance is an intrinsic property of materials, corresponding to how easily electrons flow through that material when subject to a potential difference. In instances when a wire of a conducting material is thinned to the order of nanometers, the conductance of the material no longer changes continuously, but rather in discrete quantized units. In order to observe the phenomenon, a measurement circuit was built and two methods for creating a gold nanostructure were utilized: (1) the vibrating contact method, and (2) a chemical dissolution method using the acid aqua regia. The conductance quantum is theoretically predicted to be $(2e^2)/h$, where $e$ is the electron charge, $h$ is Planck's constant. The results of both of these methods will be discussed, along with their relative advantages and disadvantages.

Information about the Author:
Jacob Long is a graduating senior physics major seeking admittance to graduate school with the intent of obtaining a Ph.D.

Faculty Sponsor: Dr. Stan Zygmunt

Student Contact: jacob.long@valpo.edu

Measuring the Cosmic Ray Energy Spectrum

Laura Mattson

Departmental Affiliation: Physics and Astronomy

Cosmic rays are high-energy charged particles that enter the Earth’s atmosphere from space. The cosmic ray particles, specifically muons and electrons, interact with matter through electromagnetic forces. Measurements are taken to determine the energy spectrum of these incoming cosmic rays and its variance with the angle of these rays. The experimental setup is composed of two plastic scintillators and a NaI detector programmed into coincidence with each other. The plastic scintillators have been set up in both horizontal and vertical orientations and are used to measure the direction of the incoming cosmic rays, while the NaI detector measures the energy deposited by the cosmic ray in the detector. Data is currently being taken and the
completed results will be presented.

**Information about the Author:**
Laura Mattson is a senior majoring in physics and Chinese and Japanese studies and minoring in mathematics. She is also a member of Christ College.

**Faculty Sponsor:** Dr. Shirvel Stanislaus

**Student Contact:** laura.mattson@valpo.edu

---

**Characterizing the Frequency and Seasonal Dependence of the Sea Breeze in Houston, Texas and Its Impact on Surface Ozone**

Christopher Miko, Samantha Berkseth, Nathan Kelly

**Departmental Affiliation:** Physics and Astronomy

Sea breezes arise from temperature differences between land and an adjacent body of water, forming a thermally direct circulation within the boundary layer. During summer, the resulting circulation carries air offshore during the nighttime and early morning and onshore during the afternoon. Banta et al. [2005] noted the impact of recirculation of pollution on high ozone events in Houston. This study characterizes the frequency of flow reversals that accompany the arrival of sea breeze fronts in Houston and the seasonal dependence of that frequency. Furthermore, we quantitatively analyze the effect of the sea breeze on ozone concentrations in the Houston area.

**Information about the Authors:**
The authors of this project have a background in both physics and meteorology. Students from Valparaiso University have taken part in scientific field experiments measuring ozone levels in Houston for many years. This study stemmed from previous research on the topic.

**Faculty Sponsor:** Dr. Gary Morris

**Student Contact:** samantha.berkseth@valpo.edu

---

**Using π^0^0^0^0's to Understand Proton Spin Structure through Polarized p+p Collisions at 1 < η < 2 and √s = 200 GeV at STAR**

Stephen Place

**Departmental Affiliation:** Physics and Astronomy

Measurements of spin dependent observables at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory provide unique insight into the contribution of a proton's constituents to its spin. The Solenoidal Tracker at RHIC (STAR) can be used to measure effects of the quark and gluon spins in the proton by observations of neutral pions that result from longitudinally and transversely polarized proton-proton collisions in STAR. The neutral pions (π^0^0^0^0's) decay into two photons that, for pseudorapidity (η) 1 to 2, can be observed in the endcap electromagnetic calorimeter in STAR. These are used to reconstruct the kinematic properties of the π^0^0^0^0's and we can then look for spin asymmetries in π^0^0^0^0 production. Measurements of both the longitudinal and transverse spin asymmetries in the production of π^0^0^0^0's from data taken in 2006 have made some contributions to our understanding of the structure of the proton. New data taken in 2009, in a longitudinal spin run with greater luminosity, will provide greater precision in the final results. Results from 2006 (STAR’s most recent spin paper, submitted to Phys. Rev. D: arXiv:1309.1800) and preliminary work on 2009 data are shown.

**Information about the Author:**
Stephen Place is a sophomore physics major.

**Faculty Sponsor:** Dr. Adam Gibson-Even

**Student Contact:** stephen.place@valpo.edu

---

**Generalization of Social Skills Learned via Video-Modeling in Children with ASD**

Andrea Bretl, Lindsey Smith

**Departmental Affiliation:** Psychology

Impairments in reciprocal pretend play are well documented in children with a diagnosis of Autism Spectrum Disorder (ASD). The effectiveness of many different behavioral teaching techniques has been examined in order to teach play skills to children with autism. Central to our purpose is the application of video-modeling to the training of new skills in children with ASD. Research has provided ample support for the notion that new skills may be acquired by observation of video-modeled behavior. Our study will examine the cooperative social behavior of children with ASD and the probability of generalization of social skills learned from video modeling. Further, we hope to discern whether video-modeling alone is sufficient or whether video-modeling must be paired with other techniques, such as prompting, to be effective in training social response in children. This project aims to reveal the level of effectiveness of video-modeling in training new social interaction skills to children with ASD.
This information will be of significant benefit to therapists, parents, and caregivers as they strive to identify the most effective treatments for their children.

**Information about the Authors:**
Andrea Bretl is a senior psychology major. She is interested in developmental psychology, particularly as it relates to childhood disorders. She plans to pursue graduate training in developmental psychology with an emphasis on autism. Lindsey Smith is a senior double major in psychology and art, with a minor in theater. She is interested in issues examining the intersection between art and psychology. She plans to pursue graduate studies in art therapy at the University of Louisville.

**Faculty Sponsor:** Dr. Angela Vernon

**Student Contact:** andrea.bretl@valpo.edu

---

**An International Comparison of Law Enforcement Stress and Professional Satisfaction**

Holly Buckman, Agata Freedle, Amanda Tuohy, Amanda Zelechoski

**Departmental Affiliation:** Psychology

This study was a cross-cultural comparison of stress and coping styles in the U.S. and England. To date, no studies have directly compared police officer stress in the U.S. and England. Police officers were recruited to complete surveys on stress, coping strategies, and job satisfaction. Data collection in England is ongoing, but U.S. results indicate that organizational stress impacted law enforcement officers (LEOs) more than operational stress. Environmental and educational factors also had a significant effect on reported stress. However, marital status was the only factor that influenced which coping strategies LEOs used. This poster will discuss the findings of this study, as well as discuss policy implications relating to stress response strategies.

**Information about the Authors:**
All of the authors are members of Professor Zelechoski's Psychology, Law, and Trauma Lab and are planning to pursue careers in clinical or counseling psychology.

**Faculty Sponsor:** Dr. Amanda Zelechoski

**Student Contact:** holly.buckman@valpo.edu

---

**The Effects of Guided Reading on Reading Comprehension**

Jaqueline Garcia, Jared Joseph, Alex Carli

**Departmental Affiliation:** Psychology

Understanding written material is paramount to everyone’s functioning in society. To bolster our knowledge of the topic, this study sought to test the effects of guided questions with in-text cues on reading comprehension. Participants were asked to read a section of text. Those with the experimental manipulation had visual cues embedded in the reading. These cues were intended to guide participants toward information that was pertinent to the prompt and to post-reading questions. The control group was not exposed to these cues, but was still asked to respond to the questions. Participants were then given a post-test that analyzed the effect of guided questions and the use of cues throughout the text. Questions in the post-test pertained to information targeted by the cues in the text, making them target questions for those who were exposed to the cues in that section of the text, while this was non-target information to the participants not given symbols in that area of the text. Those in the third group served as a control, without any cues throughout the text. Along with reading questions, participants were given a portion of the Multi-Media Comprehension Battery (MMCB) to determine individual comprehension scores. The findings will improve our understanding of reading comprehension.

**Information about the Authors:**
Jaqueline Garcia (senior), Jared Joseph (sophomore), and Alex Carli (senior) are students in Dr. Carlson’s cognitive psychology lab. They designed this experiment as a result of their exploration of general comprehension.

**Faculty Sponsor:** Dr. Kieth Carlson

**Student Contact:** jaqueline.garcia@valpo.edu
Applying Memory Science to the Classroom: Effects of Reading Questions and Answer Keys on Test Scores

Holly Griskell, Erin Harrington, Andrea Bretl, Emmanuel Bara-Hart, Nathaniel Terry, Amanda McCullough, Phuong Quynh Nguyen

Departmental Affiliation: Psychology

Instructors and students are constantly searching for effective ways to increase reading comprehension. Cognitive science would suggest that both additional assessment as described by the testing effect and timely feedback would increase comprehension. Our study investigated the effect of assigning reading questions on the quiz scores of undergraduate students. We also examined the effect of giving students an answer key versus verbal feedback on final quiz scores. Prior to the intervention, students completed a reading and then were given a pre-test group activity and post-test during class. Researchers selected certain class sections to complete ungraded questions prior to class as well as selecting sections to receive answer keys during the group activity. We found that students who completed reading questions had significantly higher initial quiz scores than those who did not complete reading questions. Results also showed that students who had an answer key during their class activity scored significantly higher on their final quiz than those who reviewed the answers with an instructor. This research provides insight into maximizing student tests scores and improving reading comprehension. This technique can be applied to fields outside of an educational setting to increase initial understanding of material.

Information about the Authors:
The authors are currently enrolled in the Psychology Department’s Human Cognition Lab.

Faculty Sponsor: Dr. Kieth Carlson

Student Contact: erin.harrington@valpo.edu

Expressive Writing as a Manipulation to Reduce Test Anxiety

Chelsea Kiehl, Brittney Groulx, Torrie Decker

Departmental Affiliation: Psychology

Students of all ages struggle with test anxiety. Not only does this anxiety affect the mental well-being of a student but it can also impair test performance. Previous research has found that expressive writing about the feelings a student may have before an exam can significantly reduce test anxiety. Prior experiments were carried out in a laboratory setting and without serious consequences for participants. These conditions do not clarify whether the results found could be helpful for a typical university exam. The goal of this study is to determine whether this
These deadly thoughts could lead one to a life of addictions. These thoughts formed the foundation of the Life Interests Questionnaire (LIQ). This self-report survey consists of 170 items, all of which are scored on a Likert scale (1 = strongly agree and 5 = strongly disagree). The LIQ was paired with an interest survey containing 43 items taken from previously tested measures. These questions asked about one’s religious identification, locus of control, and beliefs about the world. In a pilot study, each attachment item group was examined through confirmatory factor analysis which allowed the substructure of the questionnaire to be examined and the overall fit of the model was found to be marginally adequate (GFI 0.8889). Reliability and validity of this measure were attained primarily through construct validity and it found both a valid and reliable measure of Evagrius’s underlying theory. Future plans include correlational studies between religious identification/practices and level of disordered attachments.

Information about the Authors:
The authors are all a part of a research group under Dr. Jim Nelson. Victoria Labitan is a senior psychology major who has been participating in the project since January 2012. Kelly Perfect is a senior psychology major who has participated in the research group for two and a half years. Diana Stribl is a senior psychology major who has been participating in the research group since 2012. Avery Blackburn is a junior psychology major who has been participating since fall 2013. Erin Harrington is a junior psychology major who has been participating since fall 2013. Lisa Bowman is a junior psychology major who started participating in spring 2014. Linnea Greci is a junior psychology major who also started participating in the research group in spring 2014. Elizabeth Hostetler is a senior psychology major who has participated in the research group for two years. Heidi Binder is a junior psychology major who has worked in the group since fall 2013.

Faculty Sponsor: Dr. Jim Nelson

Student Contact: kelly.perfect@valpo.edu

Assessing Addictions in a Spiritual World: Using Confirmatory Factor Analysis and Structural Equations Modeling to Develop the Life Interests Questionnaire

Victoria Labitan, Kelly Perfect, Diana Stribl, Avery Blackburn, Erin Harrington, Lisa Bowman, Linnea Greci, Elizabeth Hostetler, Heidi Binder

Departmental Affiliation: Psychology

This study uses the thoughts and writings of Evagrius of Ponticus to provide a measure useful in assessing addictions in relation to spirituality. Evagrius (1972) theorizes that there are eight tempting thoughts that can form the basis of disordered attachments, and that

Faculty Sponsor: Dr. Jennifer Winquist

Student Contact: chelsea.kiehl@valpo.edu

Assessing Addictions in a Spiritual World: Using Confirmatory Factor Analysis and Structural Equations Modeling to Develop the Life Interests Questionnaire

Victoria Labitan, Kelly Perfect, Diana Stribl, Avery Blackburn, Erin Harrington, Lisa Bowman, Linnea Greci, Elizabeth Hostetler, Heidi Binder

Departmental Affiliation: Psychology

This study uses the thoughts and writings of Evagrius of Ponticus to provide a measure useful in assessing addictions in relation to spirituality. Evagrius (1972) theorizes that there are eight tempting thoughts that can form the basis of disordered attachments, and that
classroom, within themselves, or within the community. Service learning is a growing area of focus at Valparaiso University, a small liberal arts college in Indiana. We are interested in examining the prevalence of service learning on the Valparaiso University campus and the relationship between service learning and students’ college experience. Approximately 100 students will be anonymously surveyed. The sample will be students who have been enrolled or are currently enrolled in courses that require a service learning component or students who have participated in a service project that is coupled with a reflective essay or discussion. Transformation will be defined as being an active change in the student’s life because of his/her service learning experience. This study has implications for the promotion of service learning experiences at Valparaiso University.

Information about the Authors:
Randi Charters, Cassie Hailey, Mary O’Brien, and Dashiauna Washington are all junior social work majors. The group has been working on this research since January. All members of the group are interested in the topic of service learning. The group members believe that the results from this study will be relevant and important to the students and faculty at Valparaiso University.

Faculty Sponsor: Professor Kendre Israel
Student Contact: cassie.hailey@valpo.edu

Mental Health Stigmas and Counseling Center Utilization

Christina Crawley, Johannah Facer, Simone Ingram, Cara Odom, Sara Watts

Departmental Affiliation: Social Work

Persons with mental illness have been marginalized for generations. For many years, those with mental illness were institutionalized or incarcerated. This history of mental health and mental health treatment leaves behind stereotypes and stigmas that are still present today. There has been an increase in those who experience mental illness, particularly traditional-aged college students (18-24). Research shows that the number of students with severe psychological illness is steadily increasing on college campuses. Yet, on a yearly basis, only about one-third of persons with mental illness seek professional treatment (Bathje & Pryor, 2011). The aim for this study is to discover the relationship between self-stigmas of mental health and Valparaiso University students’ use of counseling services. Approximately 200 students at Valparaiso University will be anonymously surveyed regarding their perception of mental health, utilization of counseling services, as well as age, gender, and ethnicity. While numerous studies have been done on the relationship between self-stigmas and public stigma and their implications for usage, little research has been done looking at self-stigma as a primary factor in the usage of counseling services. Based on the findings of our study, implications might include adapting and promoting education and mental health awareness at Valparaiso University.

Information about the Authors:
The five authors of this study are junior social work majors in SOCW 365: Introduction to Methods of Social Research. Mental health counseling is just one career route social work majors are educated about as a potential pursuit after graduation. After recognizing the effects of mental health stigmas on social work students' willingness to utilize counseling services, the research team wanted to examine the effects of mental health stigmas across campus. The authors of this project have an interest in mental health awareness, but recognize that mental health education and awareness can only be promoted with evidence of its necessity. Therefore, mental health stigmas became the focus of this study.

Faculty Sponsor: Professor Kendre Israel
Student Contact: johannah.facer@valpo.edu

Emotional Responses upon Study Abroad Reentry

Amanda Jonikaitis, Patty Carrillo, Maleni Angon, Lindsey Dever

Departmental Affiliation: Social Work

The purpose of this study is to explore the negative emotional responses of United States college students upon return from study abroad experiences. Research has demonstrated that college students coming back from study abroad opportunities experience phases depicted in Lysgaard's original U-Curve model adjustment theory (Lysgaard's, 1955). The U-Curve theory stages of assimilation include honeymoon, culture shock, recovery, and adjustment phases upon reentry into one's previous culture. We will survey approximately 200 students at Valparaiso University, a small liberal arts college in Indiana, who have recently studied abroad. This correlational study will look at the relationship between emotional responses and reentry, and will also consider aspects such as location of program, gender, time lapse, and type of program. This study has important implications for
Does Watching Sexually-Oriented Reality Television Increase the Frequency of Viewers’ Sexual Activity?

Stephannie Zamboti, Angelina Goheen, Caitlin Fitzpatrick, Madeline Berger

Departmental Affiliation: Social Work

The purpose of this study is to describe the relationship between the amount of time spent watching sexually-oriented reality television programming and the frequency of viewers’ sexual activity. The research question for this study is “Does watching sexually-oriented reality television programming increase the frequency of viewers’ sexual activity?” The participants for this study are approximately 200 college-aged students from Valparaiso University in Valparaiso, Indiana. Participants will take an anonymous questionnaire that asks them about their reality television watching habits (e.g. what kind of reality television they watch and approximately how many hours per week they spend watching reality television), how many times per week on average they engage in sexual activity of any kind, along with their age, gender, and ethnicity. This study adds to the more recent and growing body of literature exploring reality television and its effects on viewers’ sexual behavior. Keywords: reality television, sexual activity, frequency

Information about the Authors:
Stephannie Zamboti is a senior social work major. Angelina Goheen, Caitlin Fitzpatrick, and Madeline Berger are all junior social work majors.

Faculty Sponsor:  Professor Kendre Israel
Student Contact:  stephannie.zamboti@valpo.edu

Doing Theology Through Discernment: An Analysis of Teresa of Avila’s Interior Castle

Lydia Hawkins

Departmental Affiliation:  Theology

Modernism’s notion of reason-based knowledge as the most valid has greatly impacted the practice of theology. As theology moved into the academic world, experiential modes of gaining knowledge of God began to be viewed with skepticism and were divorced from intellectual modes of gaining knowledge of God. "Doing theology,” as pre-modern Christians understood it, is no longer widely practiced in the field of theology. While modernism narrowed what is considered valid knowledge to reason-based inquiry, post-modernism has found modernism’s conclusion not entirely adequate and is broadening the scope for gaining modes of valid knowledge. Applying the post-modernist approach to Teresa of Avila’s Interior Castle, I found that Teresa provides the field of technology with a route which would allow it to again "do theology” in the pre-modern sense. Teresa’s ability to express her process of "doing theology” exemplifies experiential knowledge as a mode of gaining theological knowledge and displays a deep integration between experiential and intellectual knowledge of God. Teresa validates this mode of inquiry and counters the skepticism embedding in "doing theology” through her discernment practices. Teresa’s work displays the importance of allowing the field of theology to again "do theology,” as "doing theology” allows us to gain deeper knowledge than that which reason alone is able to acquire.

Information about the Author:
Lydia Hawkins is a senior majoring in psychology and theology. Interested in the concept of discernment, she has done much reading in early Christianity’s desert mothers and fathers and key figures throughout the history of Christian spirituality. After graduation, she will be serving in a year-long volunteer program in Chicago’s Amate House. She is currently discerning a vocation in ministry, spiritual direction, and/or pastoral counseling.

Faculty Sponsor:  Dr. Carolyn Leeb
Student Contact:  lydia.hawkins@valpo.edu
The Silhavy Corridor Improvement Project
Matthew Berning, Douglas Coeur, Jon Sherrick

Departmental Affiliation: Civil Engineering

The City of Valparaiso, Indiana is considering various alternatives to improve safety and efficiency at the existing signalized intersection at Silhavy Road and LaPorte Avenue. One of these alternatives is to construct a multi-lane roundabout. However, a large amount of space is required for the construction of a multi-lane roundabout. In an already heavily developed area, space is a major constraint. The city is also proposing improvements along Silhavy Road north and south of the intersection to enhance traffic flow in the area. The first goal of this research project was to determine if an appropriately sized roundabout would fit into the available space. The second objective was to study improvements in traffic conditions in the area due to the proposed roundabout at Silhavy Road and LaPorte Avenue and capacity enhancement measures along the Silhavy Road corridor. A two-lane roundabout that will fit into the available space and handle the traffic demand was designed. Using traffic simulation software, the delay was measured for both the current signalized intersection and for the proposed two-lane roundabout. The results showed a significant reduction in delay at the intersection due to the roundabout. This benefit is in addition to the safer conditions of a roundabout over a signalized intersection.

Information about the Authors:
Matt Berning, Doug Coeur, and Jon Sherrick are all civil engineering seniors in the College of Engineering.

Faculty Sponsor: Dr. Nezamuddin

Student Contact: jon.sherrick@valpo.edu

Developing a Numerical Water Quality Model for Brewster Lake
Kasey Marley, Sarah Brunsvold, Zuhdi Aljobeh

Departmental Affiliation: Civil Engineering

The purpose of this research study was to develop an advanced two-dimensional "process-oriented" numerical water quality model for Brewster Lake that incorporates the physical, chemical, and biological interactions that occur within the lake. The study included measuring and obtaining the basic physical, chemical, and biological characteristics of the lake to develop the model and appropriate initial and boundary conditions. Two rounds of measurements, one in the beginning of June and one at the end of July 2013, of the physical and chemical variables were conducted and were used to develop and calibrate the model. A hydrodynamic analysis of the lake's watershed was completed using a mass balance approach over water. A set of "process-oriented" water quality mathematical equations that incorporates the water chemical and biological interactions was developed. The finite element solution will result in predicted values for the lake's water quality parameters as a function of time and varying environmental conditions. It is anticipated that the results of this computer modeling will aid the Pierce Cedar Creek Institute staff in decision-making related to the management and planning of Brewster Lake and its watershed.

Information about the Authors:
Kasey Marley has always had an interest in environmental engineering since she job shadowed with the company Greeley and Hansen during her junior year of high school. She is a civil engineering major. In the future, she plans on obtaining a design and consulting position within the environmental engineering discipline. Sarah Brunsvold is currently a senior civil engineering major. She worked on a different research project last school year, and was excited to do more research over the summer having to do with environmental engineering. She will be attending graduate school next fall to specialize in environmental engineering and hopefully participate in more research dealing with sustainable engineering practices.

Faculty Sponsor: Dr. Zuhdi Aljobeh

Student Contact: sarah.brunsvold@valpo.edu

Simulation and Verification of Proposed Five Input Majority Logic Gates Using Quantum-dot Cellular Automata
Taylor Baldwin

Departmental Affiliation: Electrical and Computer Engineering

Several proposed designs for five input majority logic gates have been introduced in quantum-dot cellular automata (QCA) literature and this project seeks to analyze these designs. QCA are an alternative to transistors because they take advantage of quantum effects to propagate a binary signal. The purpose of
this research is to run simulations of two of these majority gates to verify their operational accuracy. A five input majority logic gate is especially useful within larger-scale QCA because it would help to minimize the overall number of cells needed for a specific QCA circuit. Our simulation runs a full-basis calculation for each possible fixed logic input (a 0 or 1) for all 32 cases present in each of the two circuits. This test is not redundant to the simulations within the literature because the proposed designs under test were simulated using approximations, like the intercellular hartree approximation. The results of our simulations verified the correct operation of one of these proposed five-input majority logic designs, however, because of symmetrical interference within the cells, one of the designs was in reality rendered inoperative. The findings of this research will be submitted to the *Journal of Microelectronics* in April of 2014.

*Information about the Author:*
Taylor Baldwin is a senior electrical engineering student who has worked on several research projects, presented several posters, and is a published author in the field of Quantum-dot Cellular Automata. He will be attending graduate school in the field of nuclear engineering specializing in fission studies in the fall of 2014.

*Faculty Sponsor:* Dr. Jeff Will, Dr. Doug Tougaw

*Student Contact:* aaron.baldwin@valpo.edu

---

**Development of a Solar Rotary-Kiln Reactor for the Reduction of Metal Oxide Particles**

Ali AlNuaimi, Adam Berry, Courtney Brandt, Jesse Fosheim, Eric Loria, Jonathan Ogland-Hand, Andrew Schrader

*Departmental Affiliation:* Mechanical and Electrical Engineering

A solar rotary-kiln reactor has been fabricated for the reduction of metal oxide particles at ~1650 K as part of a solar thermal decoupled water electrolysis process for the production of hydrogen. Particle motion is controlled through the reactor’s angular speed of rotation. At rotational speeds greater than 65 rpm, the internal walls of the reactor are fully covered with particles. Simultaneously, mixing elements generate a particle cloud in the reactor in order to increase the absorption of incident solar radiation. A model of the reactor that solves the energy conservation equation and includes the kinetics of the metal oxide reduction suggests that peak thermal efficiencies of 47 percent are possible for the reduction of hematite to magnetite. In parallel, the solid state kinetics for the reduction of cobalt oxide (a promising alternative to iron oxide) in a low oxygen partial pressure atmosphere has been determined. Reduction follows the shrinking core model and is initially limited by the rate of oxygen diffusion in the gas phase and later limited by the chemical kinetics at the shrinking reactive interface. Regression of the model to isothermal and non-isothermal thermogravimetric analyzer data yielded the temperature-dependent reaction rate parameters.

*Information about the Authors:*
No information provided.

*Faculty Sponsor:* Dr. Luke Venstrom

*Student Contact:* jesse.fosheim@valpo.edu
Comparison of English and Spanish Medical Information Sheets

Jenessa Franco, Jacob Hoffman, Lily Salinas, Theresa Whalen, Jessica Coapstick, Ila A. Jackson, Graciela Payan

Departmental Affiliation: Nursing

Background: Low health literacy increases costs and negatively affects outcomes. According to recent surveys, Hispanics comprise the lowest scoring ethnic group. To increase understanding, information is provided in Spanish. Question: How do select English and Spanish medication information sheets compare? Purpose: The purpose of this study was to determine whether medication information given to a patient in English had the exact same format and readability level as that given in Spanish. Design: Case Study. Methods: Two drug information sheets, one on Warfarin and one on Amoxicillin from two different pharmacies, were chosen for comparison. We translated the Spanish drug information sheets into English to compare and contrast the information and readability. Results: Many of the English information sheets were easier to read due to page layout and word choice than the Spanish-to-English. Also, some of the information in the English version was different than the Spanish-to-English version. Conclusion: Medical personnel need to be knowledgeable about the information given to their patients in order to provide the best care. They cannot assume that the translated versions contain the same information as the English version. More research needs to be explored about this topic so that practice can be improved.

Information about the Authors: Jenessa Franco, Jacob Hoffman, Lily Salinas, and Theresa Whalen are senior nursing students. Jessica Coapstick and Ila A. Jackson are sophomore nursing students. Graciela Payan is a freshman nursing student. All are interested in how low health literacy impacts health outcomes and ways to minimize this impact.

Faculty Sponsor: Dr. Carole Pepa, Dr. Constance Lemley

Student Contact: ila.jackson@valpo.edu

Beyond the Volcanoes: A Community Partnership for Health in Rural Nicaragua

Claire Simonpietri, Carly Crave, Christina Lundy, Jamielynn Tinkey

Departmental Affiliation: Nursing

Background: Health inequities related to gender, ethnicity, socioeconomic status, and geography exist in rural Nicaragua due in part to lack of access to health services. The purpose of this ongoing project is to improve health equity in rural Nicaragua through social transformation using community-based participatory action research. Bronfenbrenner’s ecological model of human development, school health, and primary health care theories provided the framework for this research. Methods: Community-based participatory action research involves six phases: partnership, assessment, planning, implementation, evaluation, and dissemination. In the implementation phase, community residents were randomly selected to participate in the cookstove intervention. Survey data were collected on demographic variables, cooking methods, layout of the homes, and health. During the evaluation phase, survey data were collected on the same parameters at follow-up. Results: Compared with the initial survey, responses from the post-survey one year after stove installation showed statistically significant differences in the improvement of health factors related to cough, shortness of breath, eye irritation, and headaches among the women who received a stove. Conclusions: The results show that installing improved cookstoves with chimneys has decreased many symptoms previously experienced by residents of homes in which cooking had been over open fires in the past.

Information about the Authors: Claire Simonpietri, Carly Crave, and Christina Lundy are senior nursing students. They have been involved with the research team for two to three years and have traveled multiple times to the community in Nicaragua. Jamielynn Tinkey, a sophomore nursing student, is excited to be joining the team and about her first trip to Nicaragua in March. They enjoyed presenting at the American Public Health Association Annual Meeting in November 2013. They are all hoping to pursue careers related to public and global health upon graduation.

Faculty Sponsor: Dr. Amy Cory

Student Contact: claire.simonpietri@valpo.edu
### Fall 2013

<table>
<thead>
<tr>
<th>Student</th>
<th>Dept.</th>
<th>Faculty Sponsor</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avery Blackburn, Erin Harrington, Victoria Labitan, Kelly Perfect</td>
<td>Psychology</td>
<td>Jim Nelson</td>
<td>Assessing Addictions in a Spiritual World: Using Confirmatory Factor analysis and Structural Equations Modeling to Develop the Life Interests</td>
</tr>
<tr>
<td>Jacob Long</td>
<td>Physics/Astronomy</td>
<td>Stan Zygmunt</td>
<td>Measuring Quantum Conductance in Fold Nanowires</td>
</tr>
<tr>
<td>Jordan Otto</td>
<td>Chemistry</td>
<td>Jon Schoer</td>
<td>Solar Thermal Decoupled Electrolysis: A Deeper Look into Solution Chemistry</td>
</tr>
<tr>
<td>Claire Simonpietri</td>
<td>Nursing</td>
<td>Amy Cory</td>
<td>Beyond the Volcanoes: A Community Partnership for Health in Rural Nicaragua</td>
</tr>
<tr>
<td>Kevin Wagner</td>
<td>Geography/Meteorology</td>
<td>Bart Wolf</td>
<td>Forecasting and Intercepting the 28 May 2013 Bennington, KS Tornadic Supercell: A Student Perspective</td>
</tr>
<tr>
<td>Ruyue (Julia) Yuan</td>
<td>Mathematics and Computer Science</td>
<td>Lara Pudwell</td>
<td>Intractable Sums Tamed: New Upper Bounds for Covering Arrays</td>
</tr>
</tbody>
</table>

### Spring 2014

<table>
<thead>
<tr>
<th>Student</th>
<th>Dept.</th>
<th>Faculty Sponsor</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fernando Aguilar, Eric Honert, Alex Kozlowski</td>
<td>Mechanical Engineering</td>
<td>Craig Goehler</td>
<td>Estimating Upper Extremity Joint Contributions in Functional Motions to Create a Metric for Injury Prevention Using OpenSim</td>
</tr>
<tr>
<td>Brandon Benninger</td>
<td>Environmental Science</td>
<td>Bharath Ganesh Babu</td>
<td>Invasive Aquatics Research: Focus on Asian Carp Migration</td>
</tr>
<tr>
<td>Adam Clark</td>
<td>Physics/Astronomy</td>
<td>Shirvel Stanislaus</td>
<td>High Voltage Tests for the nEDM Experiment at Los Alamos National Laboratory</td>
</tr>
<tr>
<td>Lauren Knop, Brie Lawson, David Rutkowski</td>
<td>Mechanical Engineering</td>
<td>Craig Goehler</td>
<td>Examining the Dampening Effects of Varying Shoe Architecture during Gait</td>
</tr>
<tr>
<td>Kelsey Larson</td>
<td>Chemistry and Physics</td>
<td>Gary Morris</td>
<td>Predicting and Determining High Sulfur Dioxide Levels in Valparaiso</td>
</tr>
<tr>
<td>Matthew Libersky</td>
<td>Physics/Astronomy</td>
<td>Shirvel Stanislaus</td>
<td>Magnetic Field Mapping</td>
</tr>
<tr>
<td>Jessica Lyza</td>
<td>Chemistry</td>
<td>Robert Clark</td>
<td>The Study of Binding Affinities of Gas Molecules to the Heme Protein CooA</td>
</tr>
<tr>
<td>Stephen Place</td>
<td>Physics/Astronomy</td>
<td>Adam Gibson-Even</td>
<td>Investigating Proton Spin</td>
</tr>
<tr>
<td>Emily Reth</td>
<td>History</td>
<td>Paul Keen</td>
<td>Excavation in Kourion, Greece</td>
</tr>
<tr>
<td>Edward Wetzel</td>
<td>Chemistry</td>
<td>Laura Rowe</td>
<td>Using Site-Directed Mutagenesis to CooA to Create a Suitable Carbon Monoxide Detector</td>
</tr>
<tr>
<td>Ruyue (Julia) Yuan</td>
<td>Mathematics and Computer Science</td>
<td>Lara Pudwell</td>
<td>Avoiding Permutation Patterns in Ordered Set Partitions</td>
</tr>
</tbody>
</table>
ADDITIONAL CAMPUS EXHIBITS OR EVENTS
FOR SATURDAY, MAY 3, 2014

Color 4 a Cause 5K Run
Registration from 8:30 a.m. – 9:30 a.m.
Race begins at 10:00 a.m.
Christopher Center Community Room

College of Engineering Design Expo
Saturday, May 3, 2014
10:00 a.m. – 1:00 p.m. AND 3:00 p.m. – 8:00 p.m.
Gellersen Engineering-Mathematics Center

Department of Art
Student Art Exhibition
April 16 – May 11, 2014
Brauer Museum of Art

Athletics
Baseball Game
Valpo vs. Oakland
12:00 p.m., Emory G. Bauer Field

Department of Music
Sousa 100: The 16th Annual Sousa Tribute Concert
May 3, 2014
Chapel of the Resurrection, 1:00 PM
John Philip Sousa IV, guest narrator
Featuring the Valparaiso University Chamber Concert Band,
Luce Concert Band, and Community/University Concert Band
Jeffrey Scott Doebler, conductor
Tickets: $15 adults/$10 senior citizens and non-Valpo students
Free admission for Valpo students, faculty, and staff

Department of Theatre
Arcadia by Tom Stoppard
Directed by Lee Orchard
Performances May 3-4, 2:00 PM
University Theatre, Valparaiso University Center for the Arts
Tickets: $15 adults/$10 senior citizens and non-Valpo students
Free admission for Valpo students, faculty, and staff

Valpo after Dark Meets Cinco de Mayo
8:00 p.m., Woiwod Dining Plaza (weather permitting), Harre Union
Sponsored by Multicultural Programs and
University Programming Council
INDEX OF AUTHORS

Albertson, Heather 5
AliNuaimi, Ali 30
Angon, Maleni 27
Appel, Alisse 19, 20
Argueta, Elias 4
Averill, Benjamin 6
Baldwin, Taylor 29
Bara-Hart, Emmanuel 25
Becker, Molly 20
Benninger, Brandon 11
Berger, Madeline 28
Berkseth, Samantha 23
Berning, Matthew 29
Berry, Adam 30
Beyers, Evan 8
Binder, Heidi 26
Blackburn, Avery 26
Bowman, Lisa 26
Brainard, Adam 12, 15
Brandt, Courtnay 30
Bretl, Andrea 23, 25
Bruns, Samantha 29
Buckman, Holly 24
Carli, Alex 24
Carlson, Ann 4, 5, 6
Carme, Alexander 14
Carrillo, Patty 27
Caruthers, Alexandra 12
Charters, Randi 26
Clark, Adam 19, 20
Coapstick, Jessica 31
Cody, Ricky 15
Coeur, Douglas 29
Connelly, Ryan 12
Craft, Mary-Anne 5
Crave, Carly 31
Crawley, Christina 27
Cui, Cui 10
Curtis, Luetta 4
Danielson, Russell 12
Decker, Torrie 25
Delap, Eleanor 13
Dever, Lindsey 27
Draper, Kaylee 18
Draper, Kelsey 18
Facer, Johannah 27
Fingerle, Sarah 13

Fitzpatrick, Caitlin 28
Fosheim, Jesse 30
Franco, Jenessa 31
Freddie, Agata 24
Freeland, Chase 7
Garcia, Jaqueline 24
Gerhed, Teryn 8
Goad, David 5
Goheen, Angelina 28
Greci, Linnea 26
Griskell, Holly 25
Groulx, Brittney 25
Hailey, Cassie 26
Harrington, Erin 25, 26
Hawkins, Lydia 28
Heinlein, Kaitlyn 12, 13
Hodoghey, Selina 17
Hoffman, Jacob 31
Hostetler, Elizabeth 25, 26
Ingram, Simone 27
Jackson, ila 31
Jonikaitis, Amanda 27
Joseph, Jared 24
Keller, Caitlin 7
Kelly, Nathan 13, 23
Kennedy, Sean 7
Kenyon, Abby 20
Kiehl, Chelsea 25
Koning, Dana 14
Labitan, Victoria 26
Langholz, Erik 21
Larson, Carol 8
Larson, Kelsey 6, 19
Libersky, Matthew 21
Libreri, Domenico 12
Long, Jacob 22
Loria, Eric 30
Lundy, Christina 31
Lyza, Jessica 8
Mack, Jonathan 10
Marley, Kasey 29
Mattson, Laura 10, 22
McCullough, Amanda 11, 25
Miko, Christopher 23
Neuenfeldt, Noah 17
Nguyen, Phuong Quynh 25
Nomina, Kayla 16

Nwanne, Gerald 6
O’Brien, Mary 26
Oberrmeyer, Diandra 8
Odom, Cara 27
Oglad-Hand, Jonathan 30
Otto, Jordan 8
Payan, Graciela 31
Perfect, Kelly 26
Place, Stephen 21, 23
Prusinski, William 7
Przybyla, Matthew 6
Puvvar, Kedar 9
Reed, Justin 20
Richardson, Jessica 11
Rockey, Rachel 18
Rogers, Kaitlin 5
Row, Mallory 13
Salinas, Lily 31
Sallman, Emily 7
Schraeder, Andrew 30
Scupham, William 16
Sefcovic, Zachary 13, 14
Shanks, Emma 6
Sherrick, Jon 29
Simonpietri, Claire 31
Smith, Lindsey 23
Stermer, Katelyn 7
Stewart, Courtenay 18
Stribl, Diana 26
Terry, Nathaniel 25
Thurston, Brittany 7
Tiessen, John Eric 21
Tinkey, Jamie Lynn 31
Tuohy, Amanda 24
Ulin, Amanda 18
VanDeGuchte, Andrew 14
Wagner, Kevin 12, 15, 20
Walsh, Karl 15
Wang, Frank 9
Washington, Dashauna 26
Watts, Sara 27
Whalen, Theresa 31
Wetzel, Edward 9
Wunderlich, John 6
Young, Allison 13, 15
Yuan, Ruyue 4, 19
Zamboti, Stephannie 28
### INDEX OF FACULTY SPONSORS

<table>
<thead>
<tr>
<th>Name</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aljobeh, Zuhdi</td>
<td>29, 30</td>
</tr>
<tr>
<td>Carlson, Kieth</td>
<td>24, 25</td>
</tr>
<tr>
<td>Clark, Craig</td>
<td>13, 14, 15</td>
</tr>
<tr>
<td>Clark, Robert</td>
<td>8</td>
</tr>
<tr>
<td>Cory, Amy</td>
<td>31</td>
</tr>
<tr>
<td>Drachenberg, James</td>
<td>22</td>
</tr>
<tr>
<td>Eberhardt, Laurie</td>
<td>5</td>
</tr>
<tr>
<td>Engerer, Steven</td>
<td>9</td>
</tr>
<tr>
<td>Ganesh Babu, Bharath</td>
<td>12, 14</td>
</tr>
<tr>
<td>Gibson-Even, Adam</td>
<td>23</td>
</tr>
<tr>
<td>Goebbert, Kevin</td>
<td>12</td>
</tr>
<tr>
<td>Gong, Hui</td>
<td>4, 5, 6</td>
</tr>
<tr>
<td>Goyne, Tom</td>
<td>7, 9</td>
</tr>
<tr>
<td>Gundersen, Sara</td>
<td>11</td>
</tr>
<tr>
<td>He, Haiying</td>
<td>19, 20, 21</td>
</tr>
<tr>
<td>Helm, Kelly</td>
<td>17, 18</td>
</tr>
<tr>
<td>Holt, Jennifer</td>
<td>7</td>
</tr>
<tr>
<td>Hrivnak, Bruce</td>
<td>20</td>
</tr>
<tr>
<td>Israel, Kendre</td>
<td>27, 28</td>
</tr>
<tr>
<td>Jantzi, Kevin</td>
<td>7</td>
</tr>
<tr>
<td>Kolba, Tiffany</td>
<td>19</td>
</tr>
<tr>
<td>Lee, Carolyn</td>
<td>28</td>
</tr>
<tr>
<td>Lemley, Constance</td>
<td>31</td>
</tr>
<tr>
<td>Longan, Michael</td>
<td>15</td>
</tr>
<tr>
<td>Morris, Gary</td>
<td>21, 23</td>
</tr>
<tr>
<td>Nelson, Jim</td>
<td>25, 26</td>
</tr>
<tr>
<td>Nezamuddin</td>
<td>29</td>
</tr>
<tr>
<td>Ostoyich, Kevin</td>
<td>16</td>
</tr>
<tr>
<td>Palumbo, Robert</td>
<td>8, 9</td>
</tr>
<tr>
<td>Pepe, Carole</td>
<td>31</td>
</tr>
<tr>
<td>Pudwell, Lara</td>
<td>19</td>
</tr>
<tr>
<td>Rowe, Laura</td>
<td>7, 9</td>
</tr>
<tr>
<td>Schaefer, Charles</td>
<td>10</td>
</tr>
<tr>
<td>Schoer, Jon</td>
<td>6, 8</td>
</tr>
<tr>
<td>Seguin, Colleen</td>
<td>17</td>
</tr>
<tr>
<td>Stanislaus, Shirvel</td>
<td>20, 22, 23</td>
</tr>
<tr>
<td>Swanson, Rob</td>
<td>4, 5, 6</td>
</tr>
<tr>
<td>Tougaw, Doug</td>
<td>30</td>
</tr>
<tr>
<td>Upton, Edward</td>
<td>4</td>
</tr>
<tr>
<td>Venstrom, Luke</td>
<td>30</td>
</tr>
<tr>
<td>Vernon, Angela</td>
<td>24</td>
</tr>
<tr>
<td>Watters, Michael</td>
<td>6</td>
</tr>
<tr>
<td>Will, Jeff</td>
<td>30</td>
</tr>
<tr>
<td>Winquist, Jennifer</td>
<td>26</td>
</tr>
<tr>
<td>Wolf, Bart</td>
<td>15</td>
</tr>
<tr>
<td>Wuerffel, Liz</td>
<td>4</td>
</tr>
<tr>
<td>Xia, Yun</td>
<td>10</td>
</tr>
<tr>
<td>Zelechoski, Amanda</td>
<td>24</td>
</tr>
<tr>
<td>Zygmunt, Stan</td>
<td>19, 21, 22</td>
</tr>
</tbody>
</table>