The 11th Annual

Moravian College
Student Scholarship and Creative Endeavors Day

April 20, 2016

This year, 103 students, representing 31 different areas of study, are participating in the 2016 Scholars Day activities. Congratulations to these student scholars for all of their accomplishments, and many thanks to their 41 faculty sponsors. Since the inception of this event 11 years ago, 709 students have shared their scholarly accomplishments with the Moravian College community.

The 11th Annual Moravian College Undergraduate Student Scholarship and Creative Endeavors Day
April 20, 2016

MORAVIAN COLLEGE

Schedule of Events

8:45 a.m.	**Welcome and Opening Remarks** *SNYDER - Haupert Union Building*
8:55 a.m. – 10:10 a.m.	**Session I: Snyder, Student Oral Presentations** **Session I: UBC, Student Oral Presentations**
10:20 a.m. – 11:35 a.m.	**Session II: Snyder, Student Oral Presentations** **Session II: UBC, Student Oral Presentations**
11:45 a.m. – 12:45 p.m.	**Student Poster Presentations I** *Haupert Union Building, Gallery*
12:05 p.m. – 12:50 p.m.	**Session III: Snyder, Student Oral Presentations**
1:10 p.m. – 2:25 p.m.	**Session IV: Snyder, Student Oral Presentations** **Session IV: UBC, Student Oral Presentations**
2:35 p.m. – 4:10 p.m.	**Session V: Snyder, Student Oral Presentations** **Session V: UBC, Student Oral Presentations**
4:00 p.m. – 5:00 p.m.	**Student Poster Presentations II** *Haupert Union Building, Gallery*
12:00 p.m. – 4:00 p.m.	**Senior Art Exhibits**, *Payne Art Gallery – South Campus*

4:00 p.m. Reception (All Welcome), Haupert Union Building, Fireplace Lounge Area

The 11th Annual Moravian College Undergraduate Student Scholarship and Creative Endeavors Day

Program Overview

Note: Please try to attend each oral presentation session in its entirety.

SESSION I

8:45 AM	**Opening Remarks SNYDER RM, HUB**		
	Oral Presentations **Session I Snyder: Moderator – Dr. John Black** **SNYDER Room**		
8:55 AM	Adam Buzzard	Mathematics	Dr. Nathan Shank
	The k-Neighbor Component Connectivity of a Graph		
9:10 AM	Laura McBride	Environmental Science, Chemistry	Dr. Diane Husic
	Analysis of Zinc Contamination in Plants in the Remediation Area of the Lehigh Gap Wildlife Refuge		
9:25 AM	Shelby Morgan	History	Dr. Robert Mayer
	Students and the Mississippi Freedom Struggle: 1960-1964		
9:40 AM	Alyssa Nelson	Religion	Dr. William Falla
	God and the Green Bay Packers		
9:55 AM	Patrick Donahoe	Religion	Dr. Jason Radine
	The Diversity of Jewish and Palestinian Thought Regarding Contentious Religious Sites		
	Oral Presentations **Session I UBC: Moderator – Dr. Bernie Cantens** **UBC Room**		
8:55 AM	Monick Perone	Philosophy	Dr. Arash Naraghi and Dr. Leon Niemoczynski
	Phenomenology of Gender: Deconstructing the Binary		
9:10 AM	Lily DiMattia	Philosophy	Dr. Bernie Cantens
	From Non-Moral Normativity to Moral Normativity		
9:25 AM	Taylor LaValva	Ethics	Dr. Bernie Cantens
	Peter Railton's Instrumental Theory of Rationality		
9:40 AM	Nicole L. Metzger	Ethics	Dr. Bernie Cantens
	The Abortion Controversy: A Feminist-Particularist Perspective		
9:55 AM	Emma Adam	Philosophy	Dr. Bernie Cantens
	Does a Woman Have a Right to an Abortion Even if the Fetus is a Person?		

SESSION II

Oral Presentations **Session II Snyder: Moderator – Dr. Larry Lipkis** **SNYDER ROOM**			
10:20 AM	Peter Petrack *Writing The Brethren's Voice*	Music Composition	Dr. Larry Lipkis
10:35 AM	Sarah Durham *Moravian Music: Editions, Performances, and Heritage*	Music	Dr. Hilde Binford
Oral Presentations **Session II UBC: Moderator – Dr. John Reyolds** **UBC ROOM**			
10:20 AM	Tara Pardini, Aisling Doyle *Let's Talk Confidence Women to Women*	Psychology	Dr. Stacey Zaremba
10:35 AM	Ross Traphagen, Shannen Mager, Rachelle Antoine, Andrew Null, Abdullah Almugheer, Ignatios Draklellis *Economic Effects of the Clean Power Plan in Pennsylvania*	Political Science	Dr. John Reynolds
10:50 AM	Laura McBride, Paige Malewski, Brittany Spinosa-Weber *Lehigh Gap Wildlife Refuge Superfund Site Monitoring: Succession and Heavy Metal Analysis*	Environmental Science, Chemistry	Dr. Diane Husic
11:05 AM	Jackie Cook, Shelby Does, Kayla Bryant, Jimmy Pagan, Tyler Bialoblocki, David Mest *Climate Change Effects in Pennsylvania*	Political Science	Dr. John Reynolds
11:20 AM	Matthew Little , Joshua Kilian, Ronald Mendizabal, Andrew Reed, Jack Lema, Elias Saba *Technical Fixes for Climate Change*	Political Science	Dr. John Reynolds

SESSION III

Oral Presentations Session III Snyder: Moderator – Dr. Michael Bertucci SNYDER ROOM			
12:05 PM	Sabrina Signorelli	Art Education & Graphic Design	Dr. Kristin Baxter
	PAEA: How History Shapes Our Future		
12:20 PM	Dylan Grubb	Sociology	Dr. Daniel Jasper
	Bethlehem Pennsylvania: Memorial or Amusement?		
12:35 PM	Stephanie Castlen	Religion	Dr. Arash Naraghi
	Wahhabism: A Close Look on Women's Rights in Saudi Arabia		

SESSION IV

Oral Presentations Session IV Snyder: Moderator – Dr. Michael Fraboni SNYDER ROOM			
1:10 PM	Corey Wasser	Neuroscience	Dr. Stacey Zaremba
	Sex Differences in Rats on a Spatial Discrimination Procedure		
1:25 PM	Cleo Massas	Psychology	Dr. Michelle Stroffolino-Schmidt.
	Bullying: A Problem Not a Right of Passage		
1:40 PM	Zach Arcona	Psychology	Dr. Robert Brill
	Exploring Predictors of the Mental Readiness and Recovery from Injury		
1:55 PM	Cleo Massas	Psychology	Dr. Sarah Johnson
	Relationships between Color Perception and Mood		
2:10 PM	Gigi Dasilva	Studio Art	Angela Fraleigh
	Mortality: The Consciousness of Death and Its Affect On Human Behavior		

Oral Presentations Session IV UBC: Moderator – Dr. Debra Wetcher-Hendricks UBC ROOM			
1:55 PM	Zachary Molchany	Philosophy	Dr. Arash Naraghi
	Disagreement in Epistemological, Religious, and Political Contexts		
2:10 PM	Max Korten	Sociology	Dr. Debra Wetcher-Hendricks
	Cliques and Diversity Among College Students In Various Institutions		

SESSION V

Oral Presentations
Session V Snyder: Moderator – Dr. Kelly Denton-Bourhaug
SNYDER ROOM

2:35 PM	Joe Nehme, Hazel Swaid	Sociology	Dr. Debra Wetcher-Hendricks
	Uncivil Shock		
2:50 PM	Abigail Inman	Religion	Dr. Kelly Denton-Bourhaug
	God vs. Trauma		
3:05 PM	Kendra Kramer	English	Dr. John Black
	Tender Offer		
3:20 PM	Elainea Horan	Philosophy	Dr. Bernie Cantens
	John Mackie's Error Theory		
3:35 PM	Melissa Walko, Renee Liedig	Art Education	Dr. Kristin Baxter
	Teaching Philosophy and Leadership Through Children's Literature and Puppetry: Summer Art Camp Partnership with William Penn Elementary School		

Oral Presentations
Session V UBC: Moderator – Dr. Joyce Hinnefeld
UBC ROOM

2:35 PM	Audrey McSain, Gina Gambacorto, Cody Wilhelm, Kirsten Keet, Maria Manz, Yazeed Aldokhi	Political Science	Dr. John Reynolds
	Public Health Effects of Climate Change: The Call for the Clean Power Plan		
2:50 PM	Savannah A. Brown	English	Dr. Crystal Fodrey
	The Women of Moravian College: Past, Present, and Future		
3:05 PM	Fatma Susan Tufan	Peace and Justice Studies, Sociology	Dr. Kelly Denton-Borhaug and Dr. Daniel Jasper
	Missing Pieces of Peace and Justice: A Glance into the Life of Incarcerated Women Through Memoir		
3:20 PM	Emily Hanes	Nursing	Elise Colancecco
	Nonpharmacological Management of Critically Ill Delirious Patients; Contrasting Current and Best Practice		
3:35 PM	Kayleigh Ficarra, Brianna Gammel, Marne Wigfield	English	Dr. Joyce Hinnefeld
	Perspectives on Education in Twentieth-Century African-American Literature		

11:45 AM - 12:45 PM
Poster Presentations I
HAUPERT UNION BUILDING

Students	Advisor
Jaclyn Hudak	Dr. Jean DesJardin
Parental Sensitivity During Play: Supporting Very Young Children with Hearing Loss	
Paige Malewski	Drs. Sandy Bardsley Diane Husic
A Paleopathological Investigation of the Effects of Industrialization and Urbanization in England from Medieval to Post-Medieval Times	
Jennifer Francesco	Dr. Frank Kuserk
How Does Rainfall Affect E. Coli In Streams?	
David Mest	Dr. Diane Husic
Monitoring Invasive Plant Species and Interpreting Their Origins Along the Northern Half of the Appalachian Trail	
Devon Jakob	Dr. Stephen Dunham
Characterization of the Catalytic Activity of Dirhodium Carboxyamidate Complexes	
Kristin Shean	Dr. Robert Brill
Multimedia Learning and the Effects on Retention	
Kyle Hagerty	Dr. Alison Holliday
Pesticide Degradation	
Holly Wagner	Dr. Stacey Zaremba
Flipped Classroom: Helpful or Harmful	
Taylor Blake	Drs. Shari and Stephen Dunham
Nucleotide Content Effect on the DNA-Binding of Rhodium Compounds	
Natalie Herb	Dr. Christopher Jones
Courtship Behaviors of Adult Bang-Sensitive Drosophila Melanogaster Males	
Shane Harder	Dr. Michael Fraboni
Methods for Upper Bounds on the Birank Number of (3xn) Grid Graphs	
John Barr	Dr. Alison Holliday
Following Transitions of Peptide Folding: Capillary Electrophoresis vs. Ion Mobility Spectrometry	
Brett Harder	Dr. Shannon Talbott
An Exploration of Lie Algebras and Kostant's Weight Multiplicity Formula	

4:00 PM - 5:00 PM
Poster Presentations II
HAUPERT UNION BUILDING

Students	Advisor

Gregory Cahill — Dr. Sabrina Terrizzi
How the Implementation of Health Information Technology Can Reduce the Burden of Chronic Diseases in Developing Countries

Daniel Schmucker — Dr. Michael Bertucci
$n \rightarrow \pi^*$ Orbital Interactions in N-Acyl Homoserine Lactone (AHLs) and Their Affects on Hydrolysis Rates

Caroline Nehme — Dr. Stacey Zaremba
Cell Phones and Their Use in the Classroom

Ljuboslav Boskic, Rebecca Hamel — Dr. Kelly Krieble
Computer Interfacing of a Granular Material Experiment

Matthew Dill — Dr. Ruth Malenda
Fitting Potential Energy Surfaces For a Range of Internuclear Separations to Account for Vibrational Motion in Scattering Calculations

Alexandrea Sestok — Dr. Carl Salter
The Heat of Reaction of Luminol: Energy Flow in a Chemiluminescent Reaction

Alexis Thiel — Dr. Shannon Talbott
Quasi-Crowns

Brittany Spinosa — Dr. Frances irish
Extreme Snout Rotation in Boa Constrictor

Kaitlin Raseley — Dr. Christopher Jones
Mapping a Bang-Sensitive Gene in Drosophila Melanogaster

Kathleen McCoy — Dr. Kelly Denton-Bourhaug
Public Education, American Religious Pluralism and Peace

Mary Spencer — Dr. Cecilia Fox
The Neuroprotective Potential of Intranasal DNSP-11 in an Intrastriatal 6-Hydroxydopamine Rat Model: A Behavior and Cellular Study

Andrea Giardina, Courtnie Lambert — Dr. Frank Kuserk
The State of the Lehigh River: Fresh Water Fish and Macroinvertebrates

Stephanie Canete — Dr. Robert Brill
The Impact of Cognitive Restructuring versus Journal Writing on Stress Reduction

Melinda Mitchell — Dr. Michelle Stroffolino-Schmidt.
CIS: Factors Affecting Goal Attainment

Adam Struss — Dr. Alison Holliday
Phenol Extraction

Emily Marchello — Dr. Kristin Baxter
The Role of Gustavus Grunewald in Documenting Historic Bethlehem through the use of Romantic Nationalism in His Landscape Paintings

12:00 PM- 4:00 PM
Senior Art Exhibits
Payne Art Gallery - South Campus

Students	Advisor
Karli Franiak *Senior Show Art Showing*	Camille Murphy
Stephanie Dengler *Ag + You*	Camille Murphy
Rebecca Zabel *Mountain Travel App Design*	Camille Murphy
Gigi Dasilva *Mortality: The Consciousness of Death and Its Affect On Human Behavior*	Angela Fraleigh
Lara Eastman *Crystal Abstractions*	Angela Fraleigh
Angelique Ringleben *Fairytale Mandalas*	Angela Fraleigh
Brayan Arroyo *Confirmed Identity*	Angela Fraleigh
Josh Recke *Alaskan Auroras Soccer Team Branding Project*	Camille Murphy
Kaitlyn Coppens *The Art of the Flower of Life*	Angela Fraleigh
Nicole Sternemann *Fantastical Thinking*	Angela Fraleigh
Levi Cury *Soft Replicas of Fishes*	Angela Fraleigh

Acknowledgements

The 11th Annual Moravian College Student Scholarship and Creative Endeavors Day would not have been possible without the commitment of many people at Moravian College.

In addition to all of the participating students and faculty listed in this program and all other faculty and students who collaborated on research projects this year, we would like to acknowledge the contributions of the following individuals and offices:

The Rokke Endowment for Student Research and The SOAR Program

President Grigsby and the President's Office

Center for Career and Civic Engagement

Moravian College Honors Program

The HUB Management Staff

Jan Ciganick, Art Department

Food Services and Facilities Management

Student Oral Presentations I: Snyder Room
8:55 - 10:15 AM

Moderator: Dr. John Black

Title: **The k-Neighbor Component Connectivity of a Graph**
Students: Adam Buzzard
Advisor: Dr. Nathan Shank
Location: HUB Snyder Room 8:55 AM - 9:10 AM

Graphs are often used to model networks and analyze their reliability. Over the years, various connectivity measures have been studied for this purpose. The k-neighbor component connectivity is a new measure of connectivity with very different properties than previous measures. I will present results on different graph classes as well as examples of these properties.

Title: **Analysis of Zinc Contamination in Plants in the Remediation Area of the Lehigh Gap Wildlife Refuge**
Students: Laura McBride
Advisor: Dr. Diane Husic
Location: HUB Snyder Room 9:10 AM - 9:25 AM

The Lehigh Gap Wildlife Refuge consists of 750 acres within the Palmerton Zinc Superfund Site in Palmerton, Pennsylvania and lies on the Kittatinny Ridge across the Lehigh River from two previously operating zinc smelters owned by the New Jersey Zinc Company. The smoke from the smelters drifted across the river and over the mountain, depositing sulfur dioxide and heavy metals, such as zinc, cadmium, and lead, onto the slopes. This contamination killed off vegetation and led to extreme erosion, which spread the contamination into the Lehigh River. The Lehigh Gap Nature Center purchased the property in 2002 with the goal to revegetate and restore the landscape. The plan was to plant native warm season grasses. The restoration succeeded and now, almost fourteen years later, a thriving grasslands ecosystem exists. With ongoing succession and additional plantings as part of the restoration, studies of metal uptake have not yet been conducted on the forbs (herbaceous flowering plants) and woody shrubs growing at the Refuge. The purpose of this project is to analyze the amount of zinc contamination in the forbs and shrubs (both leaves and flowers) growing at the Refuge and determining the effects, if any, this could have on the ecosystem.

Title: **Students and the Mississippi Freedom Struggle: 1960-1964**
Students: Shelby Morgan
Advisor: Dr. Robert Mayer
Location: HUB Snyder Room 9:25 AM - 9:40 AM

This project will assess the role young adults played in the Civil Rights Movement in the state of Mississippi between 1960 and 1964. Through the analysis of social, political, and educational inequalities experienced by African Americans throughout the state of Mississippi, I hope to accurately capture the experience of these young people and what may have motivated many of them to take action to create change. Although this analysis revolves around a very specific time in history, this situation is not an isolated event. Much of what took place in the 1960s can be compared to the challenges of the social issues and civil rights which continue to impact our country today. Therefore I work to present not only the historical significance of this movement but also the modern implications, especially as they apply to students and young people.

Title: **God and the Green Bay Packers**
Students: Alyssa Nelson
Advisor: Dr. William Falla
Location: HUB Snyder Room 9:40 AM - 9:55 AM

I am researching the Green Bay Packers Franchise as a form of religion. Sociologists Eric Bain-Selbo, Robert Ellis, and Ted Kilmasewski, study "civil religion" and how sports, in particular football, have become a "civil religion." Civil Religion, as defined by Bain-Selbo, means "at its best is a genuine apprehension of universal and transcendent religious reality as seen in or, one could almost say, as revealed through the experience of the American people." I am using this idea of "civil religion" and applying it to the Green Bay Packers and the fanaticism of their fans. By doing this, it becomes clearer that the Green Bay Packers are a form of "civil religion. " In addition I have used Paul Tillich's idea of "humanity's ultimate concern" as another lens by which to view Green Bay Packer Fandom and their behavior. I make the connection that the "Ultimate Concern" for the Green Bay Packers and their fans is a winning record, and to ultimately win the Super Bowl. If this is not achieved, then the fans lose faith in the team.

Title: **The Diversity of Jewish and Palestinian Thought Regarding Contentious Religious Sites**
Students: Patrick Donahoe
Advisor: Dr. Jason Radine
Location: HUB Snyder Room 9:55 AM - 10:10 AM

Israeli Jews and Palestinians have a long history of contentious interaction with holy sites both religions revere. This project investigates the controversial religious sites within East Jerusalem in Israel. I begin by examining the religious ideologies that have contributed to conflict regarding the land and its holy sites. My ideological analysis especially highlights the vast differences within both Israeli Jewish communities and Palestinian communities. I focus on how a range of interpretations within Judaism view the state of Israel in diametric ways, and how Palestinian religious organizations have interacted with the region's Jewish population through equally as contrasting routes.
Finally, I discuss the ways that these varying religious frameworks have affected the landscape of the Israeli/Palestinian divide in literal ways. There is an emphasis here on right-wing extremism because many of the physical acts of aggression come from right-wing groups, many of whom harbor extremist ideologies.
This project is meant to break through the "good vs. evil" lens that dominates Western perspectives and provide a more accurate exploration of the conflict with the goal that deeper understanding will inform more sustainable political and social discourse.

Student Oral Presentations I: UBC Room
8:55 - 10:15 AM

Moderator: Dr. Bernie Cantens

Title: **Phenomenology of Gender: Deconstructing the Binary**
Students: Monick Perone
Advisor: Dr. Arash Naraghi and Dr. Leon Niemoczynski
Location: HUB UBC Room 8:55 AM - 9:10 AM

Society has come to accept gender as a determined binary of male and female with strict guidelines, norms and practices prescribed to each of these categories, which are enforced through punitive response. However, from the phenomenological standpoint, gender cannot be categorized, especially not into a binary, because it is a lived experience and a performed embodiment that is never fully determined, stable or complete; it cannot be contained within a system. Through the works of Maurice Merleau-Ponty and Judith Butler, it becomes clear that the instability and indeterminacy of gender is not a failure, as so often assumed, but rather a positive experience that can allow us to demonstrate greater acceptance with regard to genders that deviate from traditional gender norms The gender binary, a mere creation of society, may then be deconstructed through the works of Jacques Derrida, in order to create a space in which gender may be experienced without preconceived divisions or notions of 'true' or 'correct' gender. Following deconstruction, the phenomenological approach can then allow us to see the experiences of gender-nonconforming individuals as they are, in their lived and embodied richness and nuanced complexity.

Title: **From Non-Moral Normativity to Moral Normativity**
Students: Lily DiMattia
Advisor: Dr. Bernie Cantens
Location: HUB UBC Room 9:10 AM - 9:25 AM

Moral non-realism states that there are no real moral properties and thus morality is non-existent. According to moral non-realism, moral judgments, such as "it is wrong to kill" are neither true nor false or always false. Two ways of countering moral non-realism are (1) through non-natural moral realist theories and (2) naturalist realist theories. Non-natural realist theories claim that moral properties such as right and wrong are real but are outside of the nature and thus they cannot be part of the natural and social sciences. Natural realist theories claim that moral properties are real and can be found within nature. Moral natural realism is an attempt to undermine nihilistic skeptical theories in meta-ethics. In this paper I defend Peter Railton's theory of naturalistic moral realism. One of the benefits of his view is that it allows us to understand value claims as reasonable within existing and expected epistemological theories. This paper will explain the different species of realism, the fact/value distinction, and the Instrumental Conception of Rationality. I will defend Railton's argument for non-moral values and his main argument for non-moral normativity. Finally, I will show that we can move from rationality to morality by observing what is different about moral norms, and thus that we provide a view of ethics and morality that is empirical, natural and objective.

Title: **Peter Railton's Instrumental Theory of Rationality**
Students: Taylor LaValva
Advisor: Dr. Bernie Cantens
Location: HUB UBC Room 9:25 AM - 9:40 AM

The purpose of this paper is to explore a solution to the question: how can we account for moral objectivity? Moral objectivity is prevalent in society—a target of inclusion that humanity constantly moves toward via moral progress and moral learning. Peter Railton proposes a solution through his instrumental theory of individual rationality. This theory begins with normative realism, a species of moral realism, which argues that non-moral values can have the property of rightness and wrongness. The theory of individual rationality provides an example of normative realism and serves as a criterial to determine right and wrong action: if a person's action does not serve their desired end, it can be considered contextually wrong. By applying this instrumental theory of rationality to a group, Railton proposes the theory of social rationality: right moral behavior is the behavior that advances the interest of all human beings, not just one particular human being. If action is taken that serves against this social rationality, it can be considered a wrong action, and thus we are given objective morality. When society acts against social rationality, we experience moral feedback in the form of rebellion, leading to moral progress toward objective morality.

Title: **The Abortion Controversy: A Feminist-Particularist Perspective**
Students: Nicole L. Metzger
Advisor: Dr. Bernie Cantens
Location: HUB UBC Room 9:40 AM - 9:55 AM

The ethics of abortion is a controversial topic and may seem irresolvable. In this paper, I argue that, precisely because it is irresolvable, we should adopt a feminist and particularist solution to the abortion issue. First, I demonstrate that determining the personhood status of a fetus is an essential problem for resolving the abortion controversy. Second, I defend Susan Gibson's view that the concept of personhood as an essentially contested concept. Third, I propose that, given the nature of the concept of personhood as an essentially contested concept, we should take on a more feminist and particularist perspective on the abortion topic. Finally, I will conclude by refuting some plausible objections to the arguments made.

Title: **Does a Woman Have a Right to an Abortion Even if the Fetus is a Person?**
Students: Emma Adam
Advisor: Dr. Bernie Cantens

Location: HUB UBC Room 9:55 AM - 10:10 AM

The main issue in the debate concerning the moral status of abortion is the question over the personhood status of the fetus. Is the developing embryo or fetus a potential person or is it a person? This issue is essential because, if it is a person, then we should grant the embryo or fetus all of the basic and fundamental rights that are normally granted to an adult human person, including the right to life, liberty and the pursuit of happiness. But if this is true then all abortions must be not only morally wrong but considered murder and should be illegal. In this paper, I defend the view that a woman has a right to an abortion, even if the fetus is considered a person with all of the basic fundamental rights normally granted to persons.

Student Oral Presentations II: Snyder Room
10:20 - 10:55 AM

Moderator: Dr. Larry Lipkis

Title: **Writing The Brethren's Voice**
Students: Peter Petrack
Advisor: Dr. Larry Lipkis
Location: HUB Snyder Room 10:20 AM - 10:35 AM

This is a discussion of my Honors project, Writing The Brethren's Voice: a composition for trombone quartet and wind ensemble based on four Moravian hymns, and a study of the musical culture and hymnody of the early Moravians. The overall goal of this project was to produce a large scale musical composition, using four traditional Moravian hymns as the basis for a wind ensemble piece. My piece, entitled The Brethren's Voice, is a modern version of a concerto grosso, a Baroque era musical genre in which multiple instruments are featured as soloists. In my piece, the soloists will be the trombone section of the Moravian College Wind Ensemble. I will discuss the creation of my composition and the supporting research into Moravian hymnody and trombone history. I will conclude by playing excerpts from the finished piece.

Title: **Moravian Music: Editions, Performances, and Heritage**
Students: Sarah Durham
Advisor: Dr. Hilde Binford
Location: HUB Snyder Room 10:35 AM - 10:50 AM

Though this project I was able to revise and edit Moravian music from the Moravian Achieves that has not been performed since the 1700s. I discovered differences in copies of the same song that were found in Bethlehem and in Herrnhut Germany, the differences were sufficient enough to show the possibility that the music could have been revised for a special service in Germany. I was also able to work on this project in Bethlehem, Winston Salem, North Carolina and Germany. During SOAR I was able to edit three songs, one was performed by the Moravian College Women's Chorus at Vespers this December and two of which are going through their final stages of editing and about to go through the publication process.

Student Oral Presentations II: UBC Room
10:20 – 11:35 AM

Moderator: Dr. John Reynolds

Title: **Let's Talk Confidence Women to Women**
Students: Tara Pardini, Aisling Doyle
Advisor: Dr. Stacey Zaremba
Location: HUB UBC Room 10:20 AM - 10:35 AM

Aisling and Tara worked on creating a Women to Women workshop to help women with their confidence. The workshop used multiple activities to have women interact and to identify their own way to help with their self-esteem. There were three sessions done throughout the spring semester that had wonderful results.

Title: **Economic Effects of the Clean Power Plan in Pennsylvania**
Students: Ross Traphagen, Shannen Mager, Rachelle Antoine, Andrew Null, Abdullah Almugheer, Ignatios Draklellis
Advisor: Dr. John Reynolds
Location: HUB UBC Room 10:35 AM - 10:50 AM

The Clean Power Plan has the potential for both positive and negative impacts on the commonwealth's economy. With the implementation of the CPP, it is projected that 273,000 jobs will be created in the United States, with 5,100 of these jobs being located here in Pennsylvania. Loss of jobs, especially in the coal industry, will naturally follow with a reduction in coal burning electric power plants. Increased employment opportunities in renewable energy industries and natural gas drilling in the state's Marcellus Shale region will more than offset the decrease in jobs in coal mining. However, it is necessary for the state to recognize its responsibilities toward displaced workers by instituting retraining programs, providing job placement opportunities and additional assistance to families affected by the plan. Climate related disasters in 2012 cost American taxpayers more than $100 billion. Pennsylvanians paid an estimated $4.1 billion, or $1,079 per taxpayer, in federal taxes to recover from extreme weather events in 2012. With climate change becoming an increasing threat to human survival, there has never been a better time to implement stricter environmental regulation to ensure a brighter future for the people of Pennsylvania, and our country.

Title: **Lehigh Gap Wildlife Refuge Superfund Site Monitoring: Succession and Heavy Metal Analysis**
Students: Laura McBride, Paige Malewski, Brittany Spinosa-Weber
Advisor: Dr. Diane Husic
Location: HUB UBC Room 10:50 AM - 11:05 AM

During the summer of 2015, succession and metal analysis studies were conducted at the Lehigh Gap Wildlife Refuge in Palmerton, PA. The Refuge lies on the northern slopes of Blue Mountain and encompasses 750 acres of the Palmerton Superfund site. Two zinc smelters, owned by the New Jersey Zinc Company, started operations in Palmerton in 1898 and ceased operations in 1980. The smoke from the smelters contained sulfur dioxide and multiple heavy metals, such as cadmium, zinc, and lead. The combination of the acid deposition from the sulfur dioxide and heavy metals killed off the vegetation on the mountain slopes, leaving a barren landscape. The topsoil eroded off the mountain into the Lehigh River, spreading the zinc contamination. A nature center purchased the land in 2002 to attempt remediation of the site by planting warm season grasses. This was a success and the Refuge now consists of a grassland habitat. The purpose of this project was to analyze the vegetation and native bees for zinc contamination, to determine if the metals were being taken up by the plants and transferred to the insects, and to conduct succession monitoring to examine the amount and diversity of plants growing at the Refuge.

Title: **Climate Change Effects in Pennsylvania**
Students: Jackie Cook, Shelby Does, Kayla Bryant, Jimmy Pagan, Tyler Bialoblocki, David Mest
Advisor: Dr. John Reynolds
Location: HUB UBC Room 11:05 AM - 11:20 AM

Anthropogenic climate change will impact nearly all sectors of Pennsylvania's economic and social foundations. Agricultural and ecological impacts will be most widely observed throughout the state, an important note considering that forests and agriculture are the largest land-uses in PA. Pennsylvania's hunting and eco-tourism industries will experience unprecedented changes due to projections of an overall warming and wetting trend in the region. Forest makeup will likely change significantly, with experts projecting an increase in tree mortality rates as invasive plants and insects become increasingly present. Substantial changes to forest composition are likely to impact deer populations, which is important considering the more than 1 million hunting licenses sold throughout Pennsylvania annually. Similarly, farmers will face new challenges in livestock

health and overall crop output. Pennsylvania's 4.5 million acres of cropland will be subjected to significant increases in intense storms, resulting in increased soil erosion, crop damage, and fertilizer runoff. Damages to cropland will be felt most by Pennsylvania's small-scale farmers. Individual steps to reduce Carbon emissions must be implemented worldwide if environmental protection techniques can hope to be effective. Subsequently, Pennsylvania must take the proper steps to reduce its carbon footprint, beginning by complying with President Obama's Clean Power Plan.

Title: **Technical Fixes for Climate Change**
Students: Matthew Little , Joshua Kilian, Ronald Mendizabal, Andrew Reed, Jack Lema, Elias Saba
Advisor: Dr. John Reynolds
Location: HUB UBC Room 11:20 AM - 11:35 AM

Carbon capture and sequestration in Pennsylvania is a principle option in the face of global warming. Carbon Capture and Sequestration (CCS) is the geological process of storing large amounts of atmospheric carbon dioxide (CO2) produced by the industrial burning of fossil fuels. The carbon storage prevents CO2 from entering the earth's atmosphere. The Environmental Protection Agency reports the United States has the capability to store 1 to 4 trillion tons of CO2 in the sublayer reservoirs. The benefits of CCS once implemented can be almost immediate since the sequestration allows current living conditions to remain the same. There is opposition to CCS technology due to an increase in investment cost of capital goods. Other cost concerns are on the actual capture and locating of geographic sites for storage. Geographical areas such as depleted gas and oil fields, deep saline reservoirs, and unmineable coal seams are all areas where sequestration can occur. Cost on transportation of the captured CO2 is also an issue since some states may not be capable of storing a sufficient amount of CO2. Suggestions to afford CCS can be done through carbon taxing in which factories will pay a tax per ton of CO2 produced. Furthermore, states can store carbon for states that produce an abundance of CO2 for a fee. Moreover, CCS technologies require approximately 15-20% more energy depending on the particular type of technology used. Particulate and nitrogen oxide emissions are expected to increase in line with the amount of the additional fuel consumed. Carbon capture and sequestration is a technological fix that can be of particular interest in Pennsylvania to reach the clean power plan emission reduction targets.

Student Oral Presentations III: Snyder Room
12:05 - 12:50 PM

Moderator: Dr. Michael Bertucci

Title: **PAEA: How History Shapes Our Future**
Students: Sabrina Signorelli
Advisor: Dr. Kristin Baxter
Location: HUB Snyder Room 12:05 PM - 12:20 PM

The history of art education has expanded and impacted our future over time. With the help of the Pennsylvania Art Education Association (PAEA), How History Shapes Our Future is a magazine hat explores the different aspects of art education that have developed over time in the state of Pennsylvania. Multiple authors contributed within the magazine to give insights into the different ranges of influence, such as Moravian's own history, advocacy and the Pennsylvania Art Education Association's goals and advances throughout the years. Dr. Baxter and I will go over our experience at the Penn State archives, collecting research and how we came to find how the history of art education shaped the future of art education and how art education is today.

Title: **Bethlehem Pennsylvania: Memorial or Amusement?**
Students: Dylan Grubb
Advisor: Dr. Daniel Jasper
Location: HUB Snyder Room 12:20 PM - 12:35 PM

Post Industrial societies project idealized versions of themselves through their architecture and landscape to both citizens and visitors. While these produced environments reflect the past, they also hide the realities of

the present day. Purposefully designed and manicured "historical districts" of cities like Bethlehem, Pennsylvania resemble amusements parks, where all space is commodified.Bethlehem can be used as a case study to explore how hyperreal environments affect the process of forming place attachment and nostalgia in post industrial societies. The process of both place attachment and nostalgia, are based in understandings of physical space. Place attachment being the feelings of sentiment towards a given place, and nostalgia being the remembrance of events in certain places. This study illustrates how hyperreal environments distorts these two interrelated processes. One of the ways the study was conducted was through a literature reviews on place attachment, and nostalgia to explore how they were interrelated. Secondly, the study was produced through observing social sites of memory in Bethlehem such as the Steelstacks. Thirdly, it was conducted through a review of previous academic research on Bethlehem. This study shows hyperreal place attachment and nostalgia, are created through hyperreal environments, and how collective memory has become privatized.

Title: **Wahhabism: A Close Look on Women's Rights in Saudi Arabia**
Students: Stephanie Castlen
Advisor: Dr. Arash Naraghi
Location: HUB Snyder Room 12:35 PM - 12:50 PM

The focus of this research will begin with the analysis of the conservative Islamic sect of Wahhabism, which is mostly practiced in the country of Saudi Arabia. This analysis will include the study of the major themes and doctrines of Wahhabism. This analysis will then be applied to the general social, economic, and political standings of the Saudi Arabian community to see how influential the religion is in their secular society. To further this analysis, there is an emphasis on how Wahhabism effects the status of women's rights in Saudi Arabia.

Student Oral Presentations IV: Snyder Room
1:10 - 2:25 PM

Moderator: Dr. Michael Fraboni

Title: **Sex Differences in Rats on a Spatial Discrimination Procedure**
Students: Corey Wasser
Advisor: Dr. Stacey Zaremba
Location: HUB Snyder Room 1:10 PM - 1:25 PM

This study examined a spatial discrimination task in the Morris Water Maze involving a rigid and sinking platform on sex differences in spatial abilities. Thirty day year-old Sprague Dawley rats (eight males and eight females) were utilized and housed in groups of same sex pairs. It was hypothesized that male rats would outperform female rats in the task through multiple measures of spatial ability being examined such as fewer errors per trial and a shorter latency average per trial. Overall, the data supporting the hypothesis is mixed and inconclusive. Females outperformed males in latency whereas males performed better by having less errors and approached the quadrant with the rigid platform.

Title: **Bullying: A Problem Not a Right of Passage**
Students: Cleo Massas
Advisor: Dr. Michelle Stroffolino-Schmidt.
Location: HUB Snyder Room 1:25 PM - 1:40 PM

The US Department of Health and Human Services, the US Department of Education, the Center for Disease Control and Prevention (CDC), and even the White House, who in 2011 held the first national bullying prevention conference, are recognizing that bullying is a national problem. As of 2015, all 50 US states have anti-bullying laws, and 40 out of the 50 states also have anti-bullying policies. This project set out to examine this issue and evaluate the available resources in the Lehigh Valley. I analyzed resources in the Lehigh Valley that were available to adolescents who were dealing with bullying. Availability of resources that address bullying are scarce. Bullying is decreasing as a school-based problem, however, it is a problem that has most

recently manifested itself in a new form, cyberbullying. Upon research, there were 15 resources found within the Lehigh Valley, ranging from therapeutic methods and prevention programs, to mentoring programs and professional sports team affiliations. After evaluating the available community resources, I set out to think of additional ways that local youth could be helped with bullying. I developed additional tools, including both a brochure and a website, in order to provide more understanding of bullying as a problem in the community.

Title: **Exploring Predictors of the Mental Readiness and Recovery from Injury**
Students: Zach Arcona
Advisor: Dr. Robert Brill
Location: HUB Snyder Room 1:40 PM - 1:55 PM

The psychological recovery from injury for athletes is an understudied aspect of sport psychology. This research used four predictor variables (pain, re-injury anxiety, attribution of responsibility, and social support) and two criterion scales (Readiness to Return to Sport and Preparedness to Play) to look for correlations. Intercollegiate athletes at Moravian College who were in the traditional season of their sport, injured while in season, and missed a minimum of a week of play but not the entire season were recruited. A two phase survey, phase one anonymously collected background and predictor data; while phase two will anonymously collect criterion data. The Athletes who came in for treatment were directed to the first survey upon their first session of rehabilitation. Results of the correlations were mixed. Negative correlations were found within Attribution of Responsibility (Internal Correlation) as well as Re-Injury Anxiety. Positive correlations were found in Social Support (Social Integration).

Title: **Relationships between Color Perception and Mood**
Students: Cleo Massas
Advisor: Dr. Sarah Johnson
Location: HUB Snyder Room 1:55 PM - 2:10 PM

The study investigated the relationship of color perception on mood. For this study there were three groups, and there were 12 participants in each group. The participants were presented the color stimuli by taking a trivia assessment, and completing a stress survey. All participants took the trivia assessment first, which contained basic trivia questions. After the trivia assessment participants were asked to complete a stress survey, to so if there was any effect of the color stimuli on stress level after the experiment.

Title: **Mortality: The Consciousness of Death and Its Affect On Human Behavior**
Students: Gigi Dasilva
Advisor: Angela Fraleigh
Location: HUB Snyder Room 2:10 PM - 2:25 PM

My methodical wall and ceiling installations confront the nature of human mortality. I analyze the ways in which the consciousness of death shapes our behavior as we individually attempt to answer life's eternal questions. Amidst all of the complexity, I'm most interested in how I can create art that embodies the great contradiction of being alive with the realization of imminent death. I gravitate to commonplace materials such as paper. The delicate manipulation of paper reflects the fragility of the human body. This material, strong and resilient in its natural form, is now rendered completely vulnerable. My most recent piece, Cemetery, relates to the processes surrounding death. I visit my small town cemetery to stand on each person's grave. I write each person's name and the date of their birth and death in a notebook. For each person I make a paper plane and each name is written on the inside of it. The process concludes with all the planes suspended in air. Thus, the cemetery is slowly lifted and given a different form of being. It is my attempt to offer each person a form of immortality through the sequences of our memory.

Student Oral Presentations IV: UBC Room
1:55 - 2:25 PM

Moderator: Dr. Debra Wetcher-Hendricks

Title: **Disagreement in Epistemological, Religious, and Political Contexts**
Students: Zachary Molchany
Advisor: Dr. Arash Naraghi
Location: HUB UBC Room 1:55 PM - 2:10 PM

Peer disagreement occurs when two or more people who are considered intellectual equals on a particular subject disagree about the proper conclusion to one of the subject's problems. Some philosophers argue that this disagreement reduces one's justification for their position such that one cannot rationally hold their original conclusion. In other words, expert peers who disagree about the truth of a particular problem are unjustified in their current beliefs. I argue that there are some scenarios where two disagreeing peers can rationally hold differing beliefs and, ultimately, peer disagreement must be looked at from a case-by-case basis. Sometimes peer disagreement reduces the evidence for our beliefs so much that we are no longer rationally justified in holding our beliefs, but sometimes peer disagreement does effectively nothing to our justification. I use religious peer disagreement as an example of this idea. I conclude by raising the question of how a democratic and liberal society, in the face of peer disagreement, can have a supporting doctrine when a democratic and liberal society is not supposed to legislate by specific doctrines and allow for a wide range of views and offer a potential solution to this problem.

Title: **Cliques and Diversity Among College Students In Various Institutions**
Students: Max Korten
Advisor: Dr. Debra Wetcher-Hendricks
Location: HUB UBC Room 2:10 PM - 2:25 PM

Cliques are groups of people, who tend to share interests, hang out with one another, and readily do not allow others to join them (www.google.com). In today's society, we notice that, "children begin to form social groups, or cliques, as they enter middle childhood…and usually consist of same-gender and same-race children, ranging in size from three to nine children" (Kwon & Lease 217). Most students have noticed this trend among many adolescents in the school setting. But some may wonder whether cliques exist once people enter colleges and universities. We may expect that as students move from elementary school to high school to college, the diversity of group characteristics might be greater as a function of moving into more adult roles. At the same time, students want to establish friendships once they arrive on campus. To answer questions about what are the factors and reasoning's that may explain the existence or non-existence of cliques in particular college settings, I test multiple hypotheses. By investigating characteristics of different colleges and their students and the different types of groups college students join, I have identified factors that influence whether students join "cliques", or expand their social group horizons.

Student Oral Presentations V: Snyder Room
2:35 - 3:50 PM

Moderator: Dr. Kelly Denton-Bourhaug

Title: **Uncivil Shock**
Students: Joe Nehme, Hazel Swaid
Advisor: Dr. Debra Wetcher-Hendricks
Location: HUB Snyder Room 2:35 PM - 2:50 PM

Culture shock can affect a lot of people that travel overseas for educational purposes, career traveling, or for leisure time away from reality. Culture shock is when the people are the different, but the circumstances stay the same. What is happening in Syria is that the people stay the same, but circumstances are different. A term created for this variation of culture shock would be called uncivil shock. Uncivil shock can be defined as when a drastic change occurs in a country, which the people live from fear often arising from war. Syria was known as a collectivistic society before the war began. From personal experience, one could go to Syria and people would open doors for anyone and shower them with hospitality and refreshments and would offer you a room in their house for the night. They do not feel a sense of trust and have to start to look after themselves and their family since the bombings and cities getting destroyed.

Title: **God vs. Trauma**
Students: Abigail Inman
Advisor: Dr. Kelly Denton-Bourhaug
Location: HUB Snyder Room 2:50 PM - 3:05 PM

In a time of smart cars and even smarter phones, technology has led to the fairly recent emergence of the discipline of trauma studies, the study explores the emotional, social, and cultural response to a life altering events such as an accident, rape, combat, or natural disasters among other events. Since the inception of the discipline of trauma studies, theorists, researchers, and philosophers have all examined questions in regards to traumatization and theodicy: How does a good God allow bad things to happen seemingly innocent people? This question has evoked a vast array of responses. My project investigates how prolonged traumatic experiences impact a person's religious identity, experience, and faith stance. In particular, I am interested to better understand how two people who have experienced similar extended situations of trauma and who generally have suffered from similar trauma related symptoms post-trauma, may nevertheless develop diametrically opposed views on the role of God in the experience of traumatization. This study focuses on the nexus of trauma theory and theodicy through focus on a specific case study of trauma.

Title: **Tender Offer**
Students: Kendra Kramer
Advisor: Dr. John Black
Location: HUB Snyder Room 3:05 PM - 3:20 PM

Tender Offer, at its most basic level, is about a father who misses his daughter's dance recital. Tender Offer is a 20th century play by Wendy Wasserstein. The play covers a very short conversation the father, Paul, has with his daughter, Lisa, when he arrives to pick her up after the recital. Their dialogue reveals much about the relationship between the father and the daughter. It is evident how hurt Lisa feels by the fact that her father missed her recital. Dialogue is more than simply the words that the characters exchange; it is also the meaning behind the words and what is implied. This exchange in words that are explicitly said and implied meanings illustrates the healing of the hurt relationship between the father and daughter pair because it allows them to gain a better understanding of each other.

Title: **John Mackie's Error Theory**
Students: Elainea Horan
Advisor: Dr. Bernie Cantens
Location: HUB Snyder Room 3:20 PM - 3:35 PM

Meta-ethics investigates the status of moral judgments. Are they beliefs or mere expressions of emotions? Do they correspond to some independent reality or are they simple constructs of human thought and desires? These questions provide the foundations of moral thought. One of the most nihilistic meta-ethical theories is John Mackie's error theory. Error theory is a cognitivist, non-realist view of moral judgments. If Mackie is right, then morality is non-existent. In this paper, I intend to present a refutation of Mackie's error theory. First, I examine Mackie's arguments from relativity, queerness, and epistemological inaccessibility. Next, I provide an exegesis of the objections involving inconsistency in relying on colloquial talk, challenges to the queerness argument, challenges to the mind-independent view, and the Moorean shift. I argue that these criticisms demonstrate the unreasonableness of error theory, and thus making it plausible that there are moral beliefs that are objectively true.

Title: **Teaching Philosophy and Leadership Through Children's Literature and Puppetry: Summer Art Camp Partnership with William Penn Elementary School**
Students: Melissa Walko, Renee Liedig
Advisor: Dr. Kristin Baxter
Location: HUB Snyder Room 3:35 PM - 3:50 PM

This past summer we focused on pulling "Big Ideas" out of children's literature to teach philosophy and leadership. The content from children's picture books was used as a basis for a broad range of art-making activities, with the focus being the creation of marionette puppets, and a culminating puppet show. We had a total of 21 children, ranging from grades 4-9, and they were mostly from William Penn Elementary School. The students who attended the camp were able to talk about these big ideas with their peers and families, and connect them to their own art-making and lives.

Student Oral Presentations V: UBC Room
2:35 - 4:10 PM

Moderator: Dr. Joyce Hinnefeld

Title: **Public Health Effects of Climate Change: The Call for the Clean Power Plan**
Students: Audrey McSain, Gina Gambacorto, Cody Wilhelm, Kirsten Keet, Maria Manz, Yazeed Aldokhi
Advisor: Dr. John Reynolds
Location: HUB UBC Room 2:35 PM - 2:50 PM

Implementing the Clean Power Plan in Pennsylvania will not only mitigate climate change effects in the state, but will also improve upon public health. This is because the burning of carbon based fuels not only releases carbon dioxide into the atmosphere, but also harmful particulate matter and toxic heavy metals. Carbon dioxide warms the atmosphere causing adverse effects such as extreme weather patterns, an increase in vector borne diseases, and heat related deaths. The rising temperatures, combined with unburned hydrocarbons and nitrogen oxides, create tropospheric ozone. This causes irritation of the respiratory system resulting in issues such as increased breathing difficulty, aggravation of asthma, and increased susceptibility to respiratory infections (Kuserk).
Particulate matter that enters the atmosphere from the burning of carbon based fuels causes ailments such as respiratory allergies and cardiovascular disease. In addition to particulate matter, toxic heavy metals are also released into the atmosphere during the firing of carbon based fuels. Both acute and chronic levels of exposure to these metals can result in multiple health related issues, such as damaged or reduced mental and central nervous functions (Kuserk).Thus, it is vital that Pennsylvania implements the Clean Power Plan because lower emissions can save lives.

Title: **The Women of Moravian College: Past, Present, and Future**
Students: Savannah A. Brown
Advisor: Dr. Crystal Fodrey
Location: HUB UBC Room 2:50 PM - 3:05 PM

I began my research on Moravian College female alumni during my SOAR project as an autoethnographic multigenre creative composition. I focused on comparisons of my personal experience at Moravian with the artifacts I uncovered of the female students from previous time periods in order to see how the school had evolved over the past 274 years. My project became a hybrid academic and personal narrative that incorporated memoir through the description and connections of the women in the archived photos I uncovered and myself, while writing a rhetorical analysis on the textual information found in the archives of Reeves Library using feminist criticism. I then continued my project through an internship with Reeves Library where I selected specific female alumni from the archived collection of oral history interviews that were conducted in 2001 on female students from the 1930s, 1940s, and 1950s. I showcased their photos and information about the students and school during those decades through an online exhibit using a program called LibGuides. Overall, my projects are important to Moravian College as an institution, but also the community, and past, present, and future students, faculty, and staff as a way to organize and share Moravian College's rich history.

Title: **Missing Pieces of Peace and Justice: A Glance into the Life of Incarcerated Women Through Memoir**
Students: Fatma Susan Tufan
Advisor: Dr. Kelly Denton-Borhaug and Dr. Daniel Jasper
Location: HUB UBC Room 3:05 PM - 3:20 PM

Today, there are more than a million women either behind the bars or under control of criminal justice system. Also, women are the fastest growing prison population that nearly doubles the rate of male incarceration since 1980s.In this study, I am focusing on the life of incarcerated women and how social injustices in our society impacted their lives. In order to discover missing pieces of peace and justice, I offered a memoir writing course for incarcerated women. I will work at the Edna Mahan Correctional Facility for Women, designing and implementing a writing course for women inmates. My goal is to create an environment with women in this facility in which they find open space to reflect on and write about their own lives and the connections therein with peace and justice questions, issues and dilemmas. This study will give us a better understanding of inequality and structural forms of injustice that impact women in this part of the United States. Also, in this study I will conclude how incarceration of women affects their families and especially their children. This study is significant because it will reflect life of incarcerated women under our current legal and social system. It will also reflect possible impacts of prison reform in their lives. I am doing this project as a Praxis/Intervention for my Peace & Justice Minor at Moravian college. The Peace & Justice Praxis helps us to connect our academics studies with real life and it provides us an opportunity to delve into real peace and justices issues in our society.

Title: **Nonpharmacological Management of Critically Ill Delirious Patients; Contrasting Current and Best Practice**
Students: Emily Hanes
Advisor: Elise Colancecco
Location: HUB UBC Room 3:20 PM - 3:35 PM

In the critical care setting, development and management of delirium continues to be a challenge. Delirium, characterized as a patient with disorganized thoughts and inattention, is a life threatening condition for older adults in intensive care. The delirious patient suffers poor outcomes including higher mortality rates (Mangusan, Hooper, Denslow and Travis, 2015). Current management of delirium primarily consists of medications, many with undesirable side effects. Nonpharmacological interventions may be effective alternatives, and, given their close proximity to patients, nurses are ideal personnel to identify and intervene. The purpose of this project was to use a descriptive survey to identify critical care nurses' knowledge and current nonpharmacological interventions used in the management of delirious patients. Concurrently, a systematic review of the literature was conducted to assess best practice in the nonpharmacological management of delirium. Surveys were available to critical care nurses from mid-October to early-December

of 2016. Results were analyzed to examine the connection between current practice and evidence of best practice. The protocol will hopefully be developed from the information provided through the synthesis of current evidence in the nonpharmacological management of critically ill delirious patients.

Title: **Perspectives on Education in Twentieth-Century African-American Literature**
Students: Kayleigh Ficarra, Brianna Gammel, Marne Wigfield
Advisor: Dr. Joyce Hinnefeld
Location: HUB UBC Room 3:35 PM - 4:10 PM

Kayleigh Ficarra, "'We Don't Need No Education': Views of Education in 'Sonny's Blues' and 'The Lesson'"

My paper explores two short stories that deal with African American life in the twentieth century, James Baldwin's "Sonny's Blues" and Toni Cade Bambara's "The Lesson", and the role that education plays in both of these stories. Both stories have a main character who does not see the value in education and throughout my paper, I strove to answer the question of whether or not the stories condemn those characters for not thinking highly of schooling. Sonny of "Sonny's Blues" frequently skips school and Sylvia of "The Lesson" holds a great degree of contempt for a character with a college degree, but I argue that the stories themselves are ambiguous about what attitude they want the reader to have towards education. As such, neither Sonny nor Sylvia is portrayed as being entirely justified in their disdain for education, but they are also not completely condemned. I also explore the idea of whether or not an education would be able to help Sonny or Sylvia out of the poor conditions that they are in.

Brianna Gammel, "Literary Depictions of Education for African-Americans"

Education is an aspect of life that is highly valued by some, but for others may not be valued or even attainable. This essay analyzes the role of education for African Americans in the twentieth century through the lives of characters in the stories "Everyday Use" by Alice Walker and "Sonny's Blues" by James Baldwin. Through the lives of the characters of these stories it can be seen that both education and cultural heritage are important but must be combined to increase the strength of the African-American community and promote greater opportunity and equality. Through the different beliefs and choices of the characters in these two stories, we see that education is not more valuable than cultural heritage or vice versa; rather, both must have a significant role in one's life. Walker's and Baldwin's stories portray the idea that if education, cultural heritage, and passion were combined, there would be less inequality in African American culture.

Marne Wigfield, "Life Lessons Outweigh Formal Education in 'Sonny's Blues' and 'Everyday Use'"

Throughout history and even today, education has been a controversial topic because it is so integral to the development each generation. "Sonny's Blues" by James Baldwin and "Everyday Use" by Alice Walker are both stories that depict the education experience of African Americans. In addition to the impact school has on individuals, both authors explore many of the things that life itself has to teach. While the characters in these stories are shaped by their school experiences, the lessons they truly take to heart are those involving family, heritage, and love. In both stories, the characters learn from the people and circumstances around them, even if they do not realize this until much later in life. In analyzing the families in both stories, it is clear that as a result of education, either formal or informal, each family experiences some degree of division.

Student Poster Presentations I: HUB Gallery
11:45 - 12:45 PM

Title: **Parental Sensitivity During Play: Supporting Very Young Children with Hearing Loss**
Students: Jaclyn Hudak
Advisor: Dr. Jean DesJardin

The overall purpose of this study was to extend our current understanding of self-efficacy beliefs and parental interactive behaviors (EA) during play between two groups of parents of children with and without mild to severe hearing loss. Observing parents of children with HL compared to those of NH will provide information regarding how hearing loss may impact parental sense of self-efficacy and their own interactive behaviors during play. Having a better understanding of the relationship between parental self-efficacy and emotional availability will help guide professionals of young children with hearing loss and their families. This poster session provides practical ways and video examples of how to collaborate with caregivers during every day play interactions based on evidence from the current cross-sectional research study with a culturally diverse group of infants with hearing loss. Results suggest that interventions for parents should be developed using a coaching model, in which parents receive interactive parent-professional training and positive constructive feedback while using strategies to support their young children during every day play interactions.

Title: **A Paleopathological Investigation of the Effects of Industrialization and Urbanization in England from Medieval to Post-Medieval Times**
Students: Paige Malewski
Advisor: Dr. Sandy Bardsley and Dr. Diane Husic

During medieval and post medieval times there were changes in lifestyle, climate, and environment that influenced the population. As the 1850s approached in England, urbanization and industrialization were flourishing. The current research is a paleopathology investigation on the effects of urbanization and industrialization, in England, from the medieval to post-medieval period (1100-1900). It has been shown in today's world that with an increase in industrialization that there are also certain diseases that increase. Some of these diseases can leave markers on skeletal remains. Air/ Water pollution, overcrowding, unsanitary conditions, and malnourishment influence the formation of these skeletal markers and the diseases they represent. These diseases such as tuberculosis (TB), sinusitis, rickets and scurvy were analyzed throughout these time periods. The results of this work will provide evidence to support the idea of whether urbanization and industrialization in England started to negatively impact the public health of the people living during these times utilizing skeletal markers. These results will also tell us what markers may be used as an indicator for environmental change and if the incidences of these particular diseases did change over time.

Title: **How Does Rainfall Affect E. Coli In Streams?**
Students: Jennifer Francesco
Advisor: Dr. Frank Kuserk

Escherichia coli is an important indicator of fecal contamination in freshwater streams and lakes as high levels suggest the probability that more serious water-borne pathogens are present. According to the 2012 Recreational Water Quality Criteria established by the US EPA, E. coli levels should not exceed an average of 126CPU/100 mL taken at stream base flow over a thirty day period. The initial purpose of this study was to determine E. coli levels at thirteen sites in the Monocacy Creek, a tributary of the Lehigh River that flows through Bethlehem, PA. While E. coli levels exceeded the 126 CPU/100 mL benchmark at every site, numbers were lower in headwater sites, increasing downstream through agricultural areas. As the main stem of the Monocacy then flowed through the city of Bethlehem, E. coli numbers gradually declined. Due to the heavy rains during June and July, it was recorded that E. coli numbers spiked soon after storms, oftentimes exceeding 2419.6 CPU/100 mL.

Title: **Monitoring Invasive Plant Species and Interpreting Their Origins Along the Northern Half of the Appalachian Trail**
Students: David Mest
Advisor: Dr. Diane Husic

As a SOAR Project, Dr. Husic and David Mest (Environmental Science, '16) designed a study to evaluate the presence and population extent of eight invasive plant species along the northern half of the Appalachian Trail, ranging 1125 miles from Waynesboro, PA to Mount Katahdin, ME. The study was completed over three months, using simple technologies and electronic field guides to identify and record species sightings. The relevant location attributes of sightings were recorded, with the goal of identifying trends that would indicate the origins of the infestation. The study revealed a higher rate of species infestation in the southern portion of the study area. Sections of forest that had been fragmented by roads, utility corridors, development, etc., were more susceptible to infestations than those that remained less impacted by human activity. Areas to the north remained less effected by the species involved in the study, with stretches of Vermont and the entire states of New Hampshire and Maine remaining largely unaffected. Species studied included: Japanese Barberry (Berberis thunbergii), Garlic Mustard (Alliaria petiolata), Oriental Bittersweet (Celastrus orbiculatus), Autumn Olive (Elaeagnus umbellate), Russian Olive (Elaeagnus angustifolia), Dwarf Honeysuckle (Diervilla lonicera), Multiflora Rose (Rosa multiflora), and Tree of Heaven (Ailanthus altissima).

Title: **Characterization of the Catalytic Activity of Dirhodium Carboxyamidate Complexes**
Students: Devon Jakob
Advisor: Dr. Stephen Dunham

A series of novel dirhodium carboxyamidate complexes have been previously synthesized and isolated in order to study their DNA-binding capabilities. This research focuses on the ability of these same dirhodium (Rh) complexes to catalyze chemical transformations. Rh complexes have proven to be efficient catalysts in a wide array of reactions including cyclopropanation, cycloaddition, and the Diels-Alder reaction. Synthesis and isolation of dirhodium trifluoroacetate (TFA) and trifluoroacetamidate (TFAcm) complexes, $[Rh_2(TFAcm)_n(TFA)_{4-n}]$, was the first goal of this study. Catalytic activity of each purified Rh complex was assessed with several alkenes and ethyl diazoacetate in a cyclopropanation reaction. Organic products of each reaction were analyzed by NMR and GCMS in order to compare yields and stereoselectivity of these Rh complexes with known Rh catalysts.

Title: **Multimedia Learning and the Effects on Retention**
Students: Kristin Shean
Advisor: Dr. Robert Brill

Multimedia learning is defined as supplementing learning with words and pictures instead of just words or pictures alone. Since learning is a lifelong process, in both academia and career, it is essential that it is determined if multimedia learning is the most effective way to deep processing. There are several different theories on how to best reach the levels of processing necessary for best retention, and this study used results from previous studies demonstrating the Cowan, Baddeley-Hitch, and Atkinson-Shiffrin models of working memory to re-test the effectiveness of multimedia learning. The purpose of this study was to use 3 different sets of 15 words presented in one of three formats: visual word only, auditory word only, and multimedia (visual word, auditory word, and picture of object) to determine which presentation led to the highest number of recalled words by the participants. Participants were counterbalanced in order to offset the learning effect, as well as given distraction tasks prior to each separate recall task to offset the memory effect. Mood and hours of previous night's sleep were also collected, as well as self-report assessments of the level of difficulty of each of the learning components. Results are predicted to support the hypothesis that the multimedia learning presentation will result in the highest number of words being recalled.

Title: **Pesticide Degradation**
Students: Kyle Hagerty
Advisor: Dr. Alison Holliday

Pesticides are used worldwide to protect crops from insects, weeds, and fungal diseases. Our goal was to take a pesticide, and degrade it by enzymatic means. Over the course of two months, my partner and I tested twenty six enzymes against myclobutanil to see if we were able to degrade it.

Title: **Flipped Classroom: Helpful or Harmful**
Students: Holly Wagner
Advisor: Dr. Stacey Zaremba

Flipping the classroom has been a rising topic in the education system that needs to be further studied to determine its effectiveness on the retention and understanding levels of students. 18 Lehigh Career and Technical Institute students served as the participants, 6 in the traditional classroom and 12 in the flipped classroom. These participants took part in at two-week study involving Newton's Laws of Motion. During this time, participants learned the three laws of motion through a series of PowerPoint lectures and worksheets in different ways depending on if the participant was in the flipped or traditional classroom. Results showed no significant difference between the flipped and traditional classroom final exam scores as expected. This may have been due to the limited sample size and potential issues regarding how the content was taught to both classes as shown in the answers to a self-evaluation form. Further research involving a more extensive study over a longer period of time should be conducted for more accurate results.

Title: **Nucleotide Content Effect on the DNA-Binding of Rhodium Compounds**
Students: Taylor Blake
Advisor: Drs. Shari and Stephen Dunham

Cisplatin, approved in the U.S. since 1978, is a chemotherapy drug which binds to and causes crosslinking of DNA. This binding causes apoptosis, making cisplatin an effective anticancer drug. Dirhodium compounds also bind to double stranded DNA and thus are being studied as potential anti-tumor agents. Although cisplatin is known to preferentially bind to purine bases, G in particular, the base preference of dirhodium compounds is not well understood. In this work, the binding of a specific dirhodium compound, (Rh2(HNOCF3)3(OOCCF3), to two types of DNA is explored. Salmon Testes DNA is a double stranded DNA that has a nucleotide content similar to that of humans (41% GC), while Dictyostelium discoideum has a unique nucleotide content (22% GC). Reacting this novel dirhodium compound with each of these DNAs and characterizing the adducts will help to understand the binding specify and mechanism of dirhodium compounds.

Title: **Courtship Behaviors of Adult Bang-Sensitive *Drosophila Melanogaster* Males**
Students: Natalie Herb
Advisor: Dr. Christopher Jones

Bang-sensitive Drosophila melanogaster are fruit flies that have mutations which cause them to succumb to paralysis when stimulated by physical agitation. This paralysis mimics that of humans with seizure disorders. By studying some of the complex behaviors of these mutants, more information could be understood about individuals with these disorders as well. Upon analyzing the elaborate process of courtship, the rate of successful copulations with wild type females for three different bang-sensitive Drosophila mutant males was found to be diminished in comparison to wild type controls. In order to better understand possible reasons for this result and better categorize the complex ritual of courtship in bang-sensitive mutants, the courtship latency, courtship duration, copulation duration, courtship index and copulation attempts of the males were observed.

Title: **Methods for Upper Bounds on the Birank Number of (3xn) Grid Graphs**
Students: Shane Harder
Advisor: Dr. Michael Fraboni

Given a graph G, a function f: V(G)→{1,2,…,k} is a k-biranking if f(u)=f(v) implies that every u-v path contains vertices x and y such that f(x)<f(u)<f(y). The birank number is the minimum k such that G has a k-biranking. The birank number for path and ladder graphs are know. However the birank number for (3xn) grid graphs are not. We have determined the birank number for small values of n and created methods to generate valid birankings for larger values of n and thus upper bounds for the birank number.

Title: **Following Transitions of Peptide Folding: Capillary Electrophoresis vs. Ion Mobility Spectrometry**
Students: John Barr
Advisor: Dr. Alison Holliday

Proteins are biological molecules that perform many important functions in living organisms. When formed, proteins go through a folding process to take on the necessary structure to perform their required function. Certain proteins are subject to misfolding, and misfolded proteins are the cause of many diseases. This calls for more to be understood about the folding process. Polyproline takes two conformations: an all-cis helical structure (PPI) and an all-trans helical structure (PPII). Intermediates along the folding pathway from PPI to PPII and PPII to PPI were recently observed with Ion mobility spectrometry–Mass spectrometry (IMS-MS). Although used to describe what is present in solution, IMS-MS makes observations of gas-phase structures. An understanding of structure in solution is necessary because proteins exist naturally in solution. Capillary electrophoresis (CE) allows for direct separation and observation of charged species in solution. Using CE, we have observed intermediates in the transition between PPI and PPII for polyproline-13. Data analysis reveals the kinetics followed by CE is similar to that of IMS. This shows CE provides experimental evidence to bridge the gap between solution and gas-phase structures, and that IMS-MS is capable of providing information on solution-phase structures.

Title: **An Exploration of Lie Algebras and Kostant's Weight Multiplicity Formula**
Students: Brett Harder
Advisor: Dr. Shannon Talbott

A lie algebra L is a vector space over a field with a bilinear product called the lie bracket;[X,Y]=XY-YX, For X,Y∈L. The special linear lie algebra of order n, sl(n,C), is the lie algebra of nxn matrices with vanishing trace. This project aims to explore the properties of lie algebras of this type and calculate weight multiplicities through the use of Kostant's Weight Multiplicity Formula.

Student Poster Presentations II: HUB Gallery
4:00 - 5:00 PM

Title: **How the Implementation of Health Information Technology Can Reduce the Burden of Chronic Diseases in Developing Countries**
Students: Gregory Cahill
Advisor: Dr. Sabrina Terrizzi

Despite the rapid progression of medical and information technologies in the industrialized parts of the world, not as much research has been conducted on the progression and benefits of these technologies in the developing world. Using a group of focus countries comprised of some of the more technologically advanced developing countries, we conduct research on the current health status of each country and the chronic diseases that are causing a burden on these economies. Given the current literature about the health and cost advantages of HIT and the case studies on real world implementations of these technologies, it appears that applying these practices in a developing economy can improve health and decrease the hardship of chronic diseases.

Title: **n → π* Orbital Interactions in N-Acyl Homoserine Lactone (AHLs) and Their Affects on Hydrolysis Rates**
Students: Daniel Schmucker
Advisor: Dr. Michael Bertucci

N-Acyl-Homoserine Lactones (AHLs) are important signaling molecules that allow bacteria to communicate through a process called quorum sensing. When this communication occurs, bacteria colonize and form clusters known as biofilms that are generally more resistant to antibiotic treatment. Since diseases, such as staph infections and pneumonia, cluster this way, understanding this signaling process could uncover more effective treatments. Recently, the impact of an electron interaction within the AHLs, known as an n → π interaction, was linked to this quorum sensing process. The purpose of our research is to prove the presence of this electron interaction and determine if it can be manipulated to breakdown the AHL and prohibit its function in promoting infections. To determine this, AHLs were synthesized with substituents that impact the n → π* interaction. Once synthesized, a hydrolysis reaction was performed, allowing the rate of each reaction to be observed through high-pressure liquid chromatography (HPLC). Based on these results, the modifications show different reaction rates, supporting the presence of an electron interaction. In addition, it appears that there is a positional correlation between the AHL hydrolysis rate, the position of the substituent on the AHL, and the strength of the stabilizing electron interaction.*

Title: **Cell Phones and Their Use in the Classroom**
Students: Caroline Nehme
Advisor: Dr. Stacey Zaremba

Cell phone usage in the classroom distracts from learning which generates divided attention. This experiment tested learning under two conditions; cell phone hidden (10 participants) and cell phones out (15 participants). A 25 minute video played, every 5 minutes the video stopped for participants to write down information on what they learned. Those who were in the cell phone out condition timed 5 minutes on their own phone whereas those in the hidden condition had their time taken for them on my phone. When the video ended, all participants took a multiple choice quiz based off the video, and a Mobile Phone Dependence Questionnaire (MPDQ). A two-way analysis of variance yielded a significant main effect of cell phone usage and its effects on quiz grades, $F = 11.83$, $p < .05$, indicating that the percent scored on the quiz was significantly lower in the cell phone out condition than in the hidden condition. Also, those who showed high dependence on the MPDQ, had an average score of 80% in the hidden condition versus a 58% in the out condition. Cell phones did significantly impact the participants' performance.

Title: **Computer Interfacing of a Granular Material Experiment**
Students: Ljuboslav Boskic, Rebecca Hamel
Advisor: Dr. Kelly Krieble

The physics of granular materials attempts to explain a wide range of natural and man-made phenomena – from avalanches of sandpiles, to the storage of grain products, to the construction of earthworks in civil engineering. A 2008 Honors Project previously conducted by Moravian College student Ryan Cress attempted to observe and quantify the inertial and frictional effects related to particle mass in granular materials. In an extension of that study we attempted to improve on his design by automating the counting procedure and pellet dropping mechanism. A digital balance and data collection interface were added to enable a more efficient method to observe the avalanches produced by adding individual pellets to a "sandpile". The process of improving the experimental procedure and trouble-shooting the interface will be discussed in this presentation.

Title: **Fitting Potential Energy Surfaces For a Range of Internuclear Separations to Account for Vibrational Motion in Scattering Calculations**
Students: Matthew Dill
Advisor: Dr. Ruth Malenda

This SOAR project is a continuation of an ongoing research effort to model changes in quantum rotational energy levels (Δj) of NaK molecules that undergo collisions with helium (He). Experimental results at Lehigh University showed a propensity for even Δj. Previous theoretical research on this project completed at Lehigh University, did not account for vibration of the NaK molecule. These calculations demonstrated a need for including the NaK vibrational motion. The next stage included an approximation using weighted averages of multiple Potential Energy Surfaces (PES's) mapping He interacting with an NaK molecule over the range of internuclear separations of Na and K corresponding to the vibrational state. This yielded results that qualitatively matched the experimental observations and made it clear that vibration played a crucial part in the interactions. The goal of this SOAR project was to prepare to include vibrational motion of NaK into scattering calculations by fitting PES's at a range of NaK separations with continuous functions. Each individual PES was fit with a linear combination of functions. The coefficients of these functions for each discrete value of internuclear separation were interpolated. These new fits of the PES's allow for scattering calculations with vibrational effects included.

Title: **The Heat of Reaction of Luminol: Energy Flow in a Chemiluminescent Reaction**
Students: Alexandrea Sestok
Advisor: Dr. Carl Salter

Luminol, a remarkably simple organic compound that emits blue light when it reacts with hydrogen peroxide, is the compound most often used to demonstrate chemiluminescence. When luminol is oxidized, the reaction produces the excited state aminophthalate anion, which has been previously identified as the chemical that emits the blue light. This exothermic reaction also produces a nitrogen molecule, which enhances the energy released due to its stable triple bond. The aminophthalate anion allows for some of the energy to be converted into electronic energy and ultimately light, but most of the energy is released as heat. There is a common misconception that luminol produces light instead of heat. Solution calorimetry experiments show that this is not the case. The average ΔH was -96.7 ± 1.0 kcal/mol luminol and the bond energy calculation for ΔH is -178.6 kcal/mol. However, excess luminol is present at the end of the reaction, so the experimental value of ΔH is a lower bound. To better quantify how much luminol was consumed, fluorescence was used to detect how much aminophthalate was produced. There was too much excess luminol in reaction mixture samples to quantify aminophthalate because the luminol blocked the fluorescence.

Title: **Quasi-Crowns**
Students: Alexis Thiel
Advisor: Dr. Shannon Talbott

This project considers a problem in graph theory, where a graph is a set of points called vertices with a set of edges that connect those vertices. One question that has motivated research for well over a century is the challenge of coloring a graph; that is, how many colors must one use to color vertices so that any two vertices that are connected by an edge are not the same color? For this project, we considered a specific type of graph called a crown, which is a visual representation of a partially ordered set or poset. Our focus was on layering these crowns, whose critical pairs give rise to an infinite family of graphs for which we know an upper bound on the chromatic number. We began looking at the properties of the layering of different crowns, with our main focus on analyzing where critical pairs show up. Layering different crowns gives a previously undefined object, so a new definition was created for a layered quasi-crown. We proved that this new object still held the three properties of a poset; reflexivity, transitivity, and antisymmetry.

Title: **Extreme Snout Rotation in Boa Constrictor**
Students: Brittany Spinosa
Advisor: Dr. Frances irish

During swallowing, snakes "walk" the head over the prey by moving upper and lower jaws on one side at a time. The snout tracks the jaws by rotating around transverse and longitudinal axes through the nasofrontal joint. Preliminary data suggested that Boa constrictor exhibits extreme snout twisting during feeding, far beyond what has been reported for other snakes. In order to place these data in a broader comparative context, we recorded swallowing in Boa constrictor and two other species, the booid Lichanura trivirgata and the more distantly–related colubrid Pantherophis guttatus. One-way analysis of variance revealed significant differences in mean snout rotation among these three species. Maximum snout rotation in Boa was 59 degrees, far beyond the maximum rotation seen in Lichanura (8 degrees)and Pantherophis (17 degrees). Future studies need to address how and why boas are capable of extreme twisting and compare them to a broader array of more closely related species.

Title: **Mapping a Bang-Sensitive Gene in *Drosophila Melanogaster***
Students: Kaitlin Raseley
Advisor: Dr. Christopher Jones

Drosophila melanogaster, a fruit fly, has long been an ideal model organism for human genetics research. A bang-sensitive gene identified as bas causes the flies to become immobilized when introduced to abrupt mechanical shock such as vortexing the vial. The bang-sensitive mutants experience a reaction comparable to a human seizure disorder, such as epilepsy. Although bas was the first bang-sensitive gene discovered, is has never been mapped to an exact location. Through the use of deletions, duplications, and three-point mapping crosses, the region that the gene is located can be narrowed down. New relevant chromosomal deletions are being induced using p elements and transposase followed by SSCP analysis.

Title: **Public Education, American Religious Pluralism and Peace**
Students: Kathleen McCoy
Advisor: Dr. Kelly Denton-Bourhaug

The study of religion in the setting of a public school is rare, but why? How has educating our youth about American religious pluralism gained such a stigma? This study looks at three different eras of public education (past, present and future) and the role of religion. First I explore a number of key events in the history of American public education that determined the fate of the teaching about religion in public schools. Second I explore the current status of teaching religion in public education in order to identify reasons and/or restrictions that currently prohibit the uninhibited teaching about religious pluralism in public education. In the third era I suggest future possibilities for the study of religion in public education with the goal of informing readers to see that educating students about American religious pluralism will promote a more peaceful society.

Title: **The Neuroprotective Potential of Intranasal DNSP-11 in an Intrastriatal 6-Hydroxydopamine Rat Model: A Behavior and Cellular Study**
Students: Mary Spencer
Advisor: Dr. Cecilia Fox

Using both in vitro and in vivo studies, glial cell line-derived neurotrophic factor (GDNF) became known as one of the more promising neurotrophic factors in its ability to protect dopamine neurons against neurotoxic insult in animal models of Parkinson's disease (PD). The proprotein version of GDNF has been post-translationally processed into a dopamine neuron stimulating peptide, known as DNSP-11. DNSP-11 has been shown to be neuroprotective against TaClo, MPP+ and an intranigral 6-hydroxydopamine (6-OHDA) lesion in rat models of PD. This research project used a different approach to introducing DNSP-11 into the animal model prior to the lesion. An intranasal DNSP-11 technique was used to assess the protection of nigral dopamine neurons against the more progressive intrastriatal lesion of 6-OHDA. Twenty Fisher 344 rats were divided into the following groups: citrate + 6-OHDA and DNSP-11 + 6-OHDA. Citrate or DNSP-11was delivered intranasally 5 days per week for 8 weeks post lesion. The foot fault and cylinder tests were performed to assess behavior improvements following treatment. Brain tissue was processed for tyrosine hydroxylase immunocytochemistry and dopamine cell survival in the substantia nigra was quantified.

Title: **The State of the Lehigh River: Fresh Water Fish and Macroinvertebrates**
Students: Andrea Giardina, Courtnie Lambert
Advisor: Dr. Frank Kuserk

Arising in the Pocono Mountains, tributaries of the Lehigh River wind through the valleys of northeastern Pennsylvania before cutting through the Kittatinny Ridge near Palmerton. The river continues southward before turning east as it flows through the cities of Allentown and Bethlehem before joining the Delaware River in Easton. The two distinct regions present an opportunity to assess water quality in streams of the more rural upper Lehigh versus the more urbanized lower watershed. Fish and macroinvertebrates are commonly used as indicators of water quality. In this study we examined fish and macroinvertebrate populations in seven streams in both the upper and lower Lehigh River watersheds. This is an ongoing study to provide a natural history of the Delaware River Watershed.

Title: **The Impact of Cognitive Restructuring versus Journal Writing on Stress Reduction**
Students: Stephanie Canete
Advisor: Dr. Robert Brill

Cognitive restructuring and journal writing have been found to be very useful and effective when it comes to reducing stress. However, which one is more effective? It is expected that participants that perform the cognitive restructuring coping method will have lower stress levels after the intervention compared to participants who perform the journal writing session. A total of 46 Moravian undergraduate students volunteered to participate in the study. Subjects were randomly assigned to one of the two conditions. Participants were asked to list their stressors, rate their stress prior to the intervention and answer questions about their current strategies, complete a journal writing session or cognitive restructuring worksheet, and then rate their stress levels after the intervention. The results showed a significant reduction in stress from pre to post levels of stress. Although the means were in the hypothesized direction, the findings were non-significant. The study consisted of many limitations and calls for further research to be done.

Title: **Factors Affecting Goal Attainment**
Students: Melinda Mitchell
Advisor: Dr. Michelle Stroffolino-Schmidt.

This study analyzed six risk factors of high school students to determine if they affected three different outcomes of goal attainment. Participants came from an urban high school in the northeast United States and consisted of 53 students (31 female and 22 male). A college student researcher conducted chi-square test for

independence analyses using a data set received from Communities In Schools (CIS). Due to the low number of students identifying with the factors and outcomes, the researcher found no significance in relation to the three outcome variables. Future research may result in significant findings with a more complete data set.

Title: **Phenol Extraction**
Students: Adam Struss
Advisor: Dr. Alison Holliday

The goal of this study has been to develop and optimize a solid phase micro extraction (SPME) method to quantify the amount of different analytes in water. For the duration of this project, the analytes subject to testing have been phenols since they're detectable by both gas chromatography (GC) and high performance liquid chromatography (HPLC). We hope that this method can be used to help maintain safe drinking water. The phenols that have been subject to testing via gas chromatography in this study are 4-nitrophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol, and 2,4-dinitrophenol. Quantification has been successful for 4-nitrophenol, but the remaining phenols have led to inconclusive results from GC analysis. Future goals of this study include quantifying via HPLC and also testing different analytes and matrices.

Title: **The Role of Gustavus Grunewald in Documenting Historic Bethlehem through the use of Romantic Nationalism in His Landscape Paintings**
Students: Emily Marchello
Advisor: Dr. Kristin Baxter

The Moravian community of Bethlehem was a self-governed establishment, making it separate from the rest of American culture. German born landscape painter Gustavus Grunewald became part of the Bethlehem settlement in the early 1830's, which marked a time of transition throughout the country. This was a period when artists created an American sense of identity by capturing the beauty of the country through its landscapes. Grunewald's paintings of Bethlehem and the surrounding areas, however, are not only creating a sense of identity through invoking history, but also through presenting a transition to the future, implementing a Romantic Nationalist style.

Senior Art Exhibits
12:00 PM – 4:00 PM
Payne Gallery – South Campus

Title: **Senior Show Art Showing**
Students: Karli Franiak
Advisor: Camille Murphy
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

I want to show a yarn brand that I created in my portfolio class. This yarn brand is called Gosh Yarn It! and it features 3 skiens and a pattern card. I will also show some of my menu designs, which include table tents & drink menu inserts.

Title: **Ag + You**
Students: Stephanie Dengler
Advisor: Camille Murphy
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

Ag + You is a brand that was created for one of my Portfolio pieces during my senior year fall semester at Moravian College. This brand is an agriculture magazine inspired by farm life and harvest season. My father is a full time farmer and I grew up on a farm. I own three horses and we have sheep at our family farm. I am inspired by the world around me; and agriculture hits close to home. People look at farm magazines and I feel as though they can be boring and at times dry. I wanted to create something stylish and intriguing. This brand is displayed across many deliverables including web and mobile applications. Here at Moravian College, I have learned about design and how to create cutting edge pieces to help express myself, and the world of graphic and interactive design.

Title: **Mountain Travel App Design**
Students: Rebecca Zabel
Advisor: Camille Murphy
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

I am driven by curiosity, the need to fix problems, and an unwavering passion for visual and interactive design. I love finding creative solutions to problems; this is the compelling reason for pursing a Graphic and Interactive Design degree at Moravian College. Through the liberal art education I also found a love for sociology. Combining these two fields strengthen my interest in user experience, and web design. I intertwined my sociological background of persona research studies, and education of how people interact with society and together with my understanding of technology, web strategies, and business to develop a meaningful and effective digital user experience. If I could describe my design style in one word it would be simplicity. Elegance and beauty is formed through strong typography, white space, grid systems, and layout. I get my inspiration from howdesign.com, Stuart Tolley (creative director of transmission graphic design studio), and huge digital agency. Over the past four years at Moravian College and through my three internships I have gained insight into how to implement a strong band across a variety of deliverables for both print and web design. My portfolio website speaks to my success in creating targeted solutions for multiple and varied client objectives. I am excited to see where my degree takes me following graduation.

Title: **Mortality: The Consciousness of Death and Its Affect On Human Behavior**
Students: Gigi Dasilva
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

My methodical wall and ceiling installations confront the nature of human mortality. I analyze the ways in which the consciousness of death shapes our behavior as we individually attempt to answer life's eternal questions.

Amidst all of the complexity, I'm most interested in how I can create art that embodies the great contradiction of being alive with the realization of imminent death. I gravitate to commonplace materials such as paper. The delicate manipulation of paper reflects the fragility of the human body. This material, strong and resilient in its natural form, is now rendered completely vulnerable.

My most recent piece, Cemetery, relates to the processes surrounding death. I visit my small town cemetery to stand on each person's grave. I write each person's name and the date of their birth and death in a notebook. For each person I make a paper plane and each name is written on the inside of it. The process concludes with all the planes suspended in air. Thus, the cemetery is slowly lifted and given a different form of being. It is my attempt to offer each person a form of immortality through the sequences of our memory.

Title: **Crystal Abstractions**
Students: Lara Eastman
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

Is color the root of healing crystals' abilities because of the preexisting psychological influences, or is there something more? Colors subconsciously and psychologically impact our emotions and even have subtle physical influences on us. Naturally occurring crystals, commonly used for healing, are also said to have an affect on our emotional and physical being. My paintings explore the relationship between the colors of healing crystals and their psychological influences in order to create paintings that impact emotional responses through color. These paintings evolve through a process of pouring paint and various paint mediums onto a canvas. It is then left to so the various paints and mediums can naturally react with each other. This technique allows the paintings to 'grow' much like the crystals they were inspired by. My paintings create an array of emotional responses, while these responses may not be exactly the same as the responses of the crystals they were inspired by, they do invoke a response. They also create a mysterious space that begs to be explored. Their abstraction enables them to have unique meanings to each individual.

Title: **Fairytale Mandalas**
Students: Angelique Ringleben
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

My work recreates the narrative of familiar children's literature through traditional Buddhist mandala design. Much like the traditional Buddhist mandalas, which tell the story of different deities, my large-scale paintings emphasize the patterns and visuals from the stories to create movement reminiscent of the plot of the tale. Blending the techniques of the Buddhist monks, by using cloth and fabric markers, and contrasting this stylization to traditional German,Danish, and Russian patterns, connects the stories with their homeland. Inspired by tapestries from college dorms mixed with a love of literature, escalated into this combination which may seem unlikely. But once the idea formed, it slowly became an obsession; the only way to calm this obsession was by creating the work. In the midst of studying and trying to understand the background of mandalas better, more similarities between the two made themselves known.

Title: **Confirmed Identity**
Students: Brayan Arroyo
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

People migrate to America in search of the "American Dream". Since this country was founded, America has been painted as the perfect place to be and the land of opportunity. My work in Payne Gallery explores this experience through people who have migrated here in search of their dream. On display are 12 engraved wood panels, next to 12 surveys. The panels have engraved fingerprints, of members of the local immigrant

community. While taking their fingerprints I surveyed each individual. The burned fingerprints refer to the burning of the fingertips that one might do to hide one's identity, while also referencing America's reliance on immigrant labor.

I create these works of art with the intention of making people aware of the struggle and hardship Latin American people face as they strive to achieve what they believe will be a better life in America.

Title: **Alaskan Auroras Soccer Team Branding Project**
Students: Josh Recke
Advisor: Camille Murphy
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

This project is a branding project for a new Major League Soccer Team. I focused on bringing the team to a new area in which to reach a new market. I chose Alaska for the team and then used significant imagery to the state in building the brand. I chose to use the aurora to represent the team for its natural beauty and the brilliant color palette it allowed me to work with. It was also a great way to describe the game of soccer itself, its flowing movements, beautiful streaks, and powerful instances. I used these characteristics to build a great logo and other items in order to create a new team.

Title: **The Art of the Flower of Life**
Students: Kaitlyn Coppens
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

My work explores Sacred Geometry, the bridge between creation and science. Sacred Geometry has been found in ancient art, religious imagery, as well as architecture all over the world. The Flower of Life the basis of all Sacred Geometry, is a pattern of circles perfectly overlaying one another to create a hexagonal image filled with delicate six petaled flowers. Though the design itself is simple, the amount of information that has been found within it is extraordinary. I create large scale paintings that are then cut into intricate designs that reflect this Flower of Life. Each design is unique and fully composed before I paint. The Flower of Life has been referred to as the building block of all life. It can be found in many forms on earth and within our universe. It is what builds our consciousness and holds our spirit. When I remove the straight edged borders I remove the traditional frame that contains a subject, so like spirit, it is free to react within a space. The paintings I create are images of our natural world that I choose to fit with the geometric design I previously formed. I am portraying something that is unseen to the naked eye. Though we know these divine proportions are there, we do not see them regularly, so instead of having the geometry hidden within life, I hide life within the geometry.

Title: **Fantastical Thinking**
Students: Nicole Sternemann
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

My work explores the difference between fantastical thinking and thinking fantastically. By referencing objects from fantasy, fiction and Sci-fi and combining them with commonplace items, my various sculptures reveal the split between reality and belief. Each piece already has some aspect to it that exists in this world, such as the materials it is made out of or a segment of the concept it represents. The T.A.R.D.I.S, dragon eggs, and mermaid comb are half an object we know, (wooden Police Box , scaly eggs, sea life encrusted comb) while the other half pertains to fantastical properties.

Title: **Soft Replicas of Fishes**
Students: Levi Cury
Advisor: Angela Fraleigh
Location: Payne Art Gallery - South Campus 12:00 PM - 4:00 PM

How can one build a wildlife replica that not only looks real, but when properly handled, moves like a real creature? What makes soft sculpture a useful artistic medium to accomplish this task? How does one interact with such a replica? And how can such a replica help us to better understand and appreciate the natural world? In my thesis I have explored these questions and related topics, and have created a number of life-like, life-sized soft replicas of real fish species from the mid-Atlantic region of the Continental United States. My process and my production methods make these replicas different from similar representations, and these unique qualities are documented with accompanying videos. These replicas, when finished, are accurate representations not only in color and form, but also in their range of motion – the fishes are flexible from head to tail and even have moving mouths, eyes, and gills, as well as working throats. They can be manipulated by handling them, and made to swim, breath, and move their eyes like the real creatures.

SOAR Grant Recipients
Summer 2015

Moravian College, Mercyhurst University, Penn State Special Collections Library, and the Pennsylvania Art Education Association: Collaborations in Historical Research
Sabrina Signorelli and Dr. Kristin Baxter

Teaching Philosophy and Leadership Through Children's Literature and Puppetry: Summer Art Camp Partnership with William Penn Elementary School
Melissa Walko, Renee Liedig and Dr. Kristin Baxter

Moravian Music: Editions, Performances, and Heritage
Sarah Durham and Dr. Hilde Binford

Early Intervention Factors that Influence Language Development in Young Children with Hearing Loss
Jaclyn Hudak and Dr. Jean DesJardin

Development of New Methods for Efficient Platinum Complex Syntheses
Tony Rivera and Dr. Stephen Dunham

Nucleotide Content Effect on the DNA-Binding of Metal Compounds
Taylor Blake and Dr. Shari Dunham and Dr. Stephen Dunham

Synthesis, Isolation, and Characterization of Catalytic Activity of Rhodium Complexes
Devon Jakob and Dr. Stephen Dunham and Dr. Shari Dunham

Encouraging Emergence / Writing the Women of Moravian College Past and Present
Savannah Brown and Dr. Crystal N. Fodrey

The Choral Village
Kurtis Reif and Dr. Joy Hirokawa

Characterization of Polyproline with Capillary Electrophoresis
John Barr and Dr. Alison Holliday

Determination of heavy metal uptake by forb plants in the Lehigh Gap Wildlife Refuge remediation areas and analysis of the impact of prescribed burning on vegetative cover, diversity and metal uptake
Laura McBride and Dr. Diane Husic

Monitoring Invasive Plant Species and Interpreting Their Origins Along the Northern Half of the Appalachian Trail
David Mest and Dr. Diane Husic

Succession Monitoring in Prescribed-burn and Control Plots at a Portion of the Restoration Area of the Palmerton Superfund Site
Brittany Spinosa-Weber and Dr. Diane Husic

Collective Memory of Bethlehem
Dylan Grubb and Dr. Daniel Jasper

Adapting Music and Memory Tasks to Study Individuals with Alzheimer's Disease
Breanne Pirino and Dr. Sarah Johnson

Electroporation of DNA into Drosophila melanogaster Embryos
Daniel Costello and Dr. Christopher Jones

Learning and memory in bang-sensitive Drosophila melanogaster
Natalie Herb and Dr. Christopher Jones

Mapping a bang-sensitive gene in Drosophila melanogaster
Kaitlin Raseley and Dr. Christopher Jones

Story: An exploration of the use of immersive media and story structure to create brand loyalty for entrepreneurs
Clint Doyle, Morgan LaPointe and Dr. Gary Kaskowitz

Computer interfacing of an experiment in granular materials
Ljube Boskic, Rebecca Hamel and Dr. Kelly Krieble

Assessing the Impact of Conservation Efforts on Water Quality in the Upper Lehigh River
Andrea Giardina, Courtnie Lambert and Dr. Frank T. Kuserk

Assessing the Extent and Impact of Coliform Bacteria in the Little Lehigh Creek
Jennifer Francesco and Dr. Frank T. Kuserk

Effects of Vibration of the NaK Molecule on Changes in the Rotational State Due to Collisions with Helium
Matthew Dill and Dr. Ruth Malenda

Youth Involvement in the Mississippi Freedom Struggle (1961-1964), with Implications for Today
(with support from the Office of Intercultural Advancement and Global Inclusion)
Shelby Morgan and Dr. Robert H. Mayer

The Epistemology of Disagreement and Subsequent Philosophical Problems
Zachary Molchany and Dr. Arash Naraghi

The Heat of Reaction of Luminol: Energy Flow in a Chemiluminescent Reaction
Alex Sestok and Dr. Carl Salter

Analyzing Network Reliability: Mixed Component Order Connectivity Functions
Adam Buzzard and Dr. Nathan Shank

Multiculturalism and Stereotype in the Twenty-first Century
(with support from the Office of Intercultural Advancement and Global Inclusion)
Samantha Weinberg and Dr. Christopher Shorr

Quasi-Crowns
Alexis Thiel and Dr. Shannon Talbott

Assessing Potential Benefits of Providing Health Information within Developing Economies
Gregory Cahill and Dr. Sabrina Terrizzi

The Potential of a Financial Crisis: The Effect of the ACA on Income Inequality
Perry Mindo and Dr. Sabrina Terrizzi

Cliques and Diversity on College Campuses in the Lehigh Valley
Max Korten and Dr. Debra Wetcher-Hendricks

Self-Esteem Workshop Development: Knowing Your Worth
Tara Pardini, Aisling Doyle and Dr. Stacey B. Zaremba

Moravian College Honors Students 2015-2016

Investigating how public health nurses can help break down barriers to immunizations
Alyssa Alessandra, Nursing
Dr. Beth Gotwals

Psychological Profiles of injured student-athletes: Coping with the pain and trauma of athletic injury
Zachary Arcona, Psychology
Dr. Robert Brill

Investigating polyproline binding using capillary electrophoresis, with Mathematical Data Analysis
John Barr, Chemistry/Mathematics
Dr. Allison Holliday

Nucleotide Content Effect on the DNA-Binding of Metal Compounds
Taylor Blake, Biochemistry
Drs. Shari and Stephen Dunham

Connectivity Functions for Conditional Connectivity Parameters
Adam Buzzard, Mathematics
Dr. Nathan Shank

Practices of Honor and Masculinity in Germany, 1918-1945
William Christman, History
Dr. Heikki Lempa

Ending the Plight of the Asiatic Elephant
Andrea Giardina, Environmental Science
Dr. Frank Kuserk

The Application of Music Therapy to Reduce Stress and Anxiety in the Critically Ill Patient
Emily Hanes, Nursing
Dr. Elise Colancecco

An Exploration of Lie Groups and Symmetries
Brett Harder, Mathematics
Dr. Shannon Talbott

Biranking on Graphs
Shane Harder, Mathematics
Dr. Michael Fraboni

Learning and Memory in Bang-sensitive Drosophila melanogaster
Natalie Herb, Biology
Dr. Christopher Jones

How skeletal markers can tell us about diseases and urbanization in Medieval England
Paige Malewski, Paleopathology
Drs. Sandy Bardsley and Diane Husic

The Role of Romantic Nationalism in the Integration of Bethlehem into American Culture as Documented by Landscape Painter Gustavus Grunewald
Emily Marchello, Art History
Dr. Kristin Baxter

Determination of Heavy Metal Uptake by Forb Plants in the Lehigh Gap Wildlife Refuge Remediation Areas
Laura McBride, Chemistry/Environmental Science
Dr. Diane Husic

Inequality and its Impact on Financial Crises
Perry Mindo, Economics
Dr. Sabrina Terrizzi

Phenomenology of Gender: The Genderqueer Experience
Monick Perone, Philosophy
Drs. Arash Naraghi and Leon Niemoczynski

Writing for the Voice of God: Composing an original work for trombone ensemble, accompanied by the MC Wind Ensemble, based upon selected Moravian Hymns
Peter Petrack, Music
Dr. Larry Lipkis

Mapping a bang sensitive gene and measuring the effects of nicotine on bang sensitive Drosophila melanogaster
Kaitlin Raseley, Biology
Dr. Christopher Jones

The Heat of Reaction of Luminol: Energy Flow in a Chemiluminescent Reaction
Alexandrea Sestok, Chemistry
Dr. Carl Salter

Moravian College Students Who Presented or Performed at the 2015 Undergraduate Conference in Medieval and Early Modern Studies

Matthew Ehritz: “Isabella of Spain”

Skylar Eidem and Erin Adolt: “Mary Frith, a.k.a, Moll Cutpurse”

Taylor Giannetti: “Anne Boleyn”

Joseph Gioia: “Anglo-Saxon Christianity: Blending of Christianity and Paganism in Anglo-Saxon England”

Chris Hassay: “Monstrousness? Caliban and his Role in The Tempest”

Alejandra Kaplan: “Female Victims Through the Eyes of María de Zayas’s La inocencia castigada and Cervantes’s El celoso extremeño”

Daniel Kilgallen: “Joan of Arc”

Catherine Lamplugh: “The Cost of Happiness”

Liz Lewis: “Lucrezia Borgia”

Gabrielle Marotta: “A Christian King's Perspective on Seville's Culture in the Middle Ages through the Cantigas de Santa Maria by Alfonso X”

Brandon C. Marth: “Exploring the Nature of Miranda”

Leah Matusewicz: “Eleanor of Aquitaine”

Colleen McMahon: “Catherine de’Medici”

Members of Art 113 taught by Professor Jan Ciganick

Moravian Celtic Ensemble — Directed by Alison Gillespie

Breanne Pirino: “Have Relationships Changed Since the Early Modern Period? A Comparison between Almodóvar's Átame (1989) and La fuerza de la sangre by Miguel Cervantes”