

STUDENT RESEARCH SYMPOSIUM

SESSION I: 9:00–10:00 A.M.
OPENING EVENT: CELEBRATION AND KEYNOTE ADDRESS

Center for Faith and Life Main Hall

“Teaching and Research: Gratitude, Discovery, Opportunity and Responsibility,” James Martin-Schramm,
 research chair in ethics and public life and professor of religion

COMMUNITY GATHERING: 10:00–10:30 A.M.
INTERLUDE AND REFRESHMENTS

Center for Faith and Life Lobby

Musical Interlude

CHAPEL: 10:30–10:50 AM
MEDICAL MISSION TO HAITI

Center for Faith and Life Main Hall

Guest speaker: Josh White '97, M.D., emergency physician and co-director, World Wide Village's Community Health Initiative in Haiti

SESSION II: 11:00 A.M.–NOON

<i>Center for Faith and Life Recital Hall</i>	<i>Dahl Centennial Union, Mott-Borlaug</i>	<i>Dahl Centennial Union, Peace</i>	<i>Dahl Centennial Union, Gallery</i>	<i>Valders 206</i>	
Beetles, Soil, and Leaves	Social and Moral Philosophy	Studies in Renaissance Literature		Maasai Culture in Tanzania	

COMMUNITY LUNCH: NOON–1:30 PM

Bell Green, Central Campus

SESSION III: 1:30–2:30 PM

<i>Center for Faith and Life Recital Hall</i>	<i>Dahl Centennial Union, Mott-Borlaug</i>	<i>Dahl Centennial Union, Peace</i>	<i>Dahl Centennial Union, Gallery</i>	<i>Valders 206</i>	
Writer's Voice	Creativity in Elementary Education		Art and Human Anatomy	Global Politics	

SESSION IV: 2:45–3:45 PM

Poster Session in Sampson Hoffland's Carlson Atrium/Valders Concourse (with refreshments and musical interlude)

SESSION V: 4:00–5:00 PM

<i>Center for Faith and Life Recital Hall</i>	<i>Dahl Centennial Union, Mott-Borlaug</i>	<i>Dahl Centennial Union, Peace</i>	<i>Dahl Centennial Union, Gallery</i>	<i>Valders 206</i>	
Ethics and Cyberspace	Faith and Everyday Life	Popular Culture and Literature			

EVENING EVENTS

5:30 p.m.—Theatre/Dance Showcase: Storre Blackbox Theatre

7:30 p.m.—Opera Performance: *Marriage of Figaro*, Center for Faith and Life Main Hall

DAY-AT-A-GLANCE

	<i>Valders 262</i>	<i>Jenson-Noble Recital Hall</i>	<i>Center for the Arts, Studio I</i>	<i>Olin 102</i>	<i>Olin Classrooms</i>
	Historical: Health and Propaganda	Mestiza: Jazz Composition		Community and Public Issues in the United States	Paideia I Research (see separate brochure)
	<i>Valders 262</i>	<i>Jenson-Noble Recital Hall</i>	<i>Center for the Arts, Studio I</i>	<i>Olin 102</i>	<i>Olin Classrooms</i>
	Identity and Cultural Expression	Choral Singing: Namibia and South Africa	Body and Movement	Psychology and Spirituality	Paideia I Research (see separate brochure)
	<i>Valders 262</i>	<i>Center for the Arts, Studio II</i>	<i>Center for the Arts, Studio I</i>	<i>Olin 102</i>	<i>Olin Classrooms</i>
	Race, Ethnicity, and Ancestry	Shakespeare Performance: <i>The Winter's Tale</i>	Movement Fundamentals with Children	United States and the World	Paideia I Research (see separate brochure)

SYMPOSIUM SCHEDULE

9:00–10:00 A.M.

SESSION I

Center for Faith and Life Main Hall

Opening Event: Celebration and Keynote Address

“Teaching and Research: Gratitude, Discovery, Opportunity and Responsibility,” James Martin-Schramm, research chair in ethics and public life and professor of religion

Celebrating the performing arts: Students of the trumpet, trombone, tuba/euphonium, and horn studios, and the Luther College Jazz Quartet

10:00–10:30 A.M.

Center for Faith and Life Lobby

Community Gathering

Interlude and refreshments

10:30–10:50 A.M.

Center for Faith and Life Main Hall

Chapel: Medical Mission to Haiti

Guest speaker: Josh White '97, M.D., emergency physician and co-director, World Wide Village's Community Health Initiative in Haiti

11:00 A.M.–NOON

SESSION II

Center for Faith and Life Recital Hall

Beetles, Soil, and Leaves

Faculty Moderator: Kirk Larsen

Reese Worthington
Scarab Beetles of Northeast Iowa

Andrew Leffler
The Effect of No-Till Land Management Practices on Carbon Sequestration

Bonnie Garvens, Julie Hanson
Identification and Phenotypic Characterization of Two New *Arabidopsis thaliana* mutants

Dahl Centennial Union, Mott-Borlaug

Social and Moral Philosophy

Faculty Moderator: Matthew Simpson

Ashley Ewing
Finding the Good: Aristotle's Use (and Misuse) of Homer in His *Nichomachean Ethics*

Anandita Mukherji
Transcendental Freedom: Exploring Hannah Arendt's Ideas of Judgment in the Face of Modern Totalitarianism

Danny Wilcox
The Problem of Moral Stagnation: Reconciling Moral Subjectivism and Positive Progress through Justice

Dahl Centennial Union, Peace

Studies in Renaissance Literature: Hamlet and Don Quixote

Faculty Moderator: Todd Pedlar

Kristi Wietecha
Hamlet and the Dead Fool's Lesson

Allison Croat
Hamlet's Moral Agency: A Psychoanalytical and Ethical Response

Leah Matheson
Identity Crises in *Don Quixote* and the Resulting Bad Consequences

Valders 206

Studies of Maasai Culture in Tanzania

Faculty Moderator: Lori Stanley

Jason Hagemeier
Deciphering Sustainability: Maasai Communities and Wildlife Conservation in Northern Tanzania

Mallory Heinzeroth
The Role of Traditional and Formal Systems of Education among the Maasai of Tanzania

Sylvie Hall, Kia Johnson
Waning Knowledge: Traditional Medicine in Maasai Culture

Valders 262

Health and Propaganda in Western Europe: Historical Studies

Faculty Moderator: Marvin Slind

Abigail Endert

Debating Quarantine during the Great Plague of London: Effective Preventative Measure or Death Sentence?

Stephanie Olson

Buboes, Saints, and Clouds: The Importance of Plague Images Created by the Black Death

Krista Solie

Nazi Indoctrination of the Youth: The Psychological Process of Gaining Future Support

Jenson-Noble Recital Hall

Mestiza: An Original Jazz Composition

Faculty Moderator: Brooke Joyce

Sky Macklay, with Luther College Jazz Orchestra

Olin 102

Community and Public Issues in the United States: Homeschooling, Sustainability, Progress

Faculty Moderator: John Moeller

Greg Shirbroun

Homeschoolers and the Transition to College

Brandon Reed

The Effectiveness of Sustainability Funds in Engaging Students at Liberal Arts Colleges

Karishma Sushilkumar

The TESS Index: Creating a National Progress Index Using an Unconventional Group of Four Factors

Olin Classrooms

Paideia I Research (see separate brochure)

NOON-1:30 P.M.

Bell Green, Central Campus

Community Lunch

1:30-2:30 P.M.

SESSION III

Center for Faith and Life Recital Hall

The Writer's Voice

Faculty Moderator: Amy Weldon

Erin Lunde

Into Thin Air on Thin Ice: Jon Krakauer's Multiple Roles as a Journalist, Climber, and Client in His Narration of the 1996 Everest Disaster

Laura Fuller

The Importance of Being Ernest: Authenticity in Hemingway's Unique Blend of Fact and Fiction

Linnea Graffunder

These Words Are My Unveiling: The Good Girl Speaks

Dahl Centennial Union, Mott-Borlaug

Creativity in Elementary Education

Faculty Moderator: Andrea Beckendorf

Hannah Berlin-Burns

Cross-Cultural Awareness in the Elementary Music Classroom

Emmalee Johnson

Creativity and Elementary Education: Lighting a Fire vs. Filling a Bucket

Dahl Centennial Union, Gallery

Art and Human Anatomy

Faculty Moderator: Benjamin Moore

Laurel Whitis

Microcosm: An Artistic and Biological Exploration of Selected Human Microanatomy

Valders 206

Global Politics: Foreign Policy, Nationalism, and Universal Rights

Faculty Moderator: Paul Gardner

Manaswini Ramkumar

The AfPak Quagmire and the India Solution

Michael Byrd

Two Decades of Disillusionment: Examining the Growth of Chinese Anti-U.S. Nationalism from 1989 to the Present

Antonia Lliteras Espinosa

Universality of Human Rights

Valders 262

Identity and Cultural Expression

Faculty Moderator: David Thompson

Amber Hendricks

Shōjo Manga: Its History and Role in Contemporary Japanese and American Society

Trena Montgomery

Weaving Identities: The Never-Ending Dialogue of Guatemalan Back Strap Weaving

Sara Zanussi

Music Is Worth More than 99 Cents: Mapuche Music and Cosmovisión

Jenson-Noble Recital Hall

Choral Singing in Namibia and South Africa

Moderators: Professor Timothy Peter, Professor Gregory Peterson

Soprano: Allison Alpers, Andrea Berven, Mandie Mickelson, Molly Ternus, Emily Wittig; alto: Jessica Boese, Amy Kallansrud, Anna Kenyon, Allison Schnier, Marissa Springer, Jenny Ward, Hannah Wiles; tenor: Culynn Curtis, Seth Duin, David Kort, Jack Lob, Ethan Schultz, Vaughn Tackmann; bass: Taylor Bergen, Joseph Carey, Douglas Hamilton, Jonathan Lueck, Ehler Orngard, John Stender

Center for the Arts, Studio I

Body and Movement

Faculty Moderator: Jane Hawley

Andrea Oldfield, Michaela Bram

Stability and Mobility through Dynamic Alignment: A Dance Informance

Jill Hughes

Seeking the Actualized and Authentic Self through Movement Study

Olin 102

Psychology and Spirituality

Faculty Moderator: Loren Toussaint

Whitney Keltner

Breast Cancer Psychometrics

Kaela Stuart

Forgiveness and Physical Health: Psychosocial Mediators

Justin Marschall

Perceptions of Control as Mediators of the Link Between Religiousness and Obesity

Olin Classrooms

Paideia I Research (see separate brochure)

2:45–3:45 P.M.

SESSION IV

Sampson Hoffland/Valders Concourse

Poster Session (with refreshments and musical interlude)

Rose Brantner, Andrew Hrvol, Joseph Nelson, Abigail Seyfer

No Species Differences Found in Relative Hippocampus and Septum Volumes Among Four Species of Food-Storing Birds

Maria Carr

America Rejects a Fountain of Youth? Resveratrol and Pathogen Assessment in Native Grapes

Corey Christensen, Morgan Ames, Karl Gilbertson, Andrew Hrvol

Self-Recognition in Clark's Nutcrackers (*Nucifraga columbiana*)

Adam Dane, Rachel Conway, Mark Fernandes, Danny Smith

Differences between American and French Youth Sports

Phuong Dau

Solid State Synthesis of Cyclophanes

Lynda Erickson

Making Space for Every Body: The Case for a Women's Initiative

David Fares

The "Bubble Effect" on Dialect: How the Luther Community Influences the Language We Speak

Erin Green, Jens Erickson, Maddie Ford, Kristen Schultz

Nuclear Energy in France

Kirsten Indrelie, Jacob Wessels

The Role of Porphyrin Structure in Porphyrin-HSA Binding

Jacob Jipp

Changes in Heparan Sulfate Proteoglycan Gene Expression during Prostate Cancer Progression

Christine Kennedy

Calvino's *Invisible Cities*: The Connection between Italian History and Calvino's Fictional Cities

Kirstin Manges

Epidemiological Analysis of Medical Outcomes Related to the Historic 2008 Flood in Winneshiek County, Iowa

Jennifer McEllistrem, Chris Nevala-Plagemann

The Effects of Local and Regional Ractors on Late Holocene Fire Regimes in Northwestern Wisconsin

Dustin Meriwether

The Organizational Effects of Prenatal Versus Pubertal Testosterone on Determining the Degree of Cerebral Lateralization

Liliane Zeh Moto, Hannah Haas, Mark Knowles, Aaidha Majdhy, Ellen Mum, Jenny St. Clair

Evolution of French Rap as Culture and Its Impact on Inner-City French Youth

Heather Nelson

Phenotypic Characterization of Mutants Exhibiting Altered Calcium Regulation in *Vibrio parahaemolyticus*

Gretchen Peters

Reaction of Secochlorin Bisaldehyde with Hydroxylamine: Toward the Synthesis of Oxadiazepinonochlorins with an Unexpected Outcome

Adam Ragheb

Responses of *Arabidopsis* to Toxins from Invasive Spotted Knapweed (*Centaurea maculosa*)

Emily Roth, Debora Mukaz, Rachel Tangen, Marcus Turen, Jessica Zenchak

Medical Aid in Times of Crises: *Médecins Sans Frontières* in Haiti

Peter Russella

Il était une fois: Quantitative Content Analysis of 17th-Century French Fairy Tales through the Lens of Evolutionary Psychology

Eric Sievers

The Effects of Plant Size and Spacing on Leaf Miner Damage in Eastern Leatherwood Populations

Kirsten Strandjord

Detection of Astronomical Events

Aaron Taylor

A Statistical Analysis of the Men's NCAA Division I Basketball Tournament

Marcus Turen

The Elusive French Body

Christina WooChing

Influences of Prolonged Sitting on Low Back Pain, Gait, and Alignment

Additional poster displays presented by more than 50 students from the following classes:

Biology 112: Insects, Humans, and the Environment

Biology 354: Evolutionary Biology

Honors 130: Scholars Colloquium

Honors 320: Modernity: Natural Sciences

Math 328: Applied Statistics II

Music 344: History of Music: Contemporary

Physics 182: Classical Physics II

Psychology 356: Stress, Coping, and Well-Being

4:00–5:00 P.M.

SESSION V

Center for Faith and Life Recital Hall
Ethics and Cyberspace: Challenge and Creativity (Paideia II: CyberEthics Project Presentations)

Faculty Moderator: Sören Steding

Ahmed Alkalili, Sarah Baughman, Liz Lubben, Eric Smith

Dating: Then, Now, and Tomorrow: Cybertechnology and the Search for Romance

Elise Baecker, Kadie Hutton, Molly Weber

The Doctor, the Patient, and the Computer: Changes in the Access to Medical Information

Morgan Ames, Matt Stotelmyre, Emily Toomey

CyberEthics and the Third Dimension: A Pop-up Book

Dahl Centennial Union, Mott-Borlaug
Faith and Everyday Life: Theological, Interfaith, and Psychological Perspectives

Faculty Moderator: Robert Shedinger

Laura Grangaard

Through the Lens of Liberation: Implications of Liberation Theology for the Future of Interfaith Movements and the Interfaith Youth Core

Culynn Curtis

Faithfully Transformed: A Bible Curriculum of Histories, Questions, and Applications

Mitchell Zoelzer

Fostering Forgiveness: An Examination into the Effectiveness of Communal Forgiveness Interventions

Dahl Centennial Union, Peace

Popular Culture and Literature

Faculty Moderator: Philip Freeman

Kelsey Mans

The Socio-Political Implications of Fairy Tales: How This Genre Will and Has Changed the Way People View the World

Laura Mohs

A Noble Courtier, or Simply a Man? Etiquette and Gender in Shakespeare's *Much Ado About Nothing*

Valders 262

Studies in Ethnicity, Race, and Ancestry

Faculty Moderator: Erin Flater

Tyler Best

The Salad Bowl Versus the Melting Pot: Preservation of Traditional Health Beliefs among Second-Generation Hmong in La Crosse, Wisconsin

Debora Mukaz

Ancestry and DNA Testing

Koji Hayakawa

Beyond the Ainu Ethnic Revival: The Politics of the Dying in Modern Japan

Center for the Arts, Studio II

Shakespeare Performed: *The Winter's Tale*

Faculty Moderator: Mark Muggli

Kine Bergholtz, Megan Creasey, Sabrina Hawkinson, Kelly Hyland, Elias Johnson, Danielle Koch, Sean McKnight, Michael Moran, Joseph Schifsky, Aimee Schreiber, Laura Schultz, Tonya Tienter, Fay Wingereid, Weiwei Zhang

Shakespeare's *The Winter's Tale*, performed by the students of English-Theatre/Dance 261, Shakespeare Performed

Center for the Arts, Studio I

Movement Fundamentals with Children: Education and Dance

Faculty Moderator: Olga Rinco

Amanda Moran, with young assistants

Oonagh Ahouse, Soren Darling, Anja

Madsen, Grace Thompson, Abigail

Toussaint, Meredith Toussaint

Creative Movement and the Young Artist Informance

Olin 102

The United States and The World

Faculty Moderator: Robert Larson

Jon Shrader, Kya Anderson, Amie Heller,

Joe Putnam, Katie Schaefer

Framing of the Middle East: An Analysis of U.S. Media Coverage of Terrorism since 9/11

Trong Thai

The Use of Agent Orange during the Vietnam War

Olin Classrooms

Paideia I Research (see separate brochure)

5:30 P.M.

THEATRE/DANCE SHOWCASE

Storre Black Box Theatre

7:30 P.M.

OPERA PERFORMANCE

Center for Faith and Life Main Hall

The Marriage of Figaro

PARTICIPANTS AND ABSTRACTS

Arranged alphabetically by student last name, followed by presentations involving more than one student, arranged by first students' last name (alphabetically within presentation)

HANNAH BERLIN-BURNS '11

Cross-Cultural Awareness in the Elementary Music Classroom

In a time when budget cuts have been making it difficult for modern language programs to be taught at younger levels and stay afloat, it is crucial more than ever that we include diversity in other areas of the curriculum. As an education student, double-majoring in French and music, I am exploring how French language and culture can be incorporated into music classes, focusing on the elementary level. During my project, I created lessons that introduce French children's songs and culture related to the songs or comparisons to American culture. For example, the lesson including "Ah, vous dirai-je maman" provides the opportunity to introduce Mozart, theme and variation, and the different attitudes French and American parents have about "guarding" their children from unpleasant concepts. While I already had the opportunity to teach my lessons, in this paper I continue to further research how French and other modern languages may be used in music classrooms. I am especially concentrating on works by Bourdieu (on French students' relation to culture), Contenta (on educational systems in various countries), and Rollins (on Nursery Rhymes in children's culture.) As the world is an ever-changing place, working to come together, it is imperative that students be aware of other cultures away as well as the diversity within their own community.

Faculty sponsor: Anne-Marine Feat

TYLER BEST '10

The Salad Bowl Versus the Melting Pot: Preservation of Traditional Health Beliefs Among Second-Generation Hmong in La Crosse, Wisconsin

For thousands of years, the Hmong have lived as an autonomous society affected little by outside influence. Since their escape from Laos, the Hmong have experienced greater pressure to acclimate to their new societies. There has been little attention made to the changes and evolution of cultural belief among the second-generation Hmong. Therefore, the purpose of

this research was to investigate the preservation of culture among the younger generation. Since the Hmong are traditionally animists, their religion deeply defines their culture, and in effect their health beliefs. One-on-one interviews assessed the younger generations' knowledge and understanding of traditional beliefs. The participants came from a variety of religious backgrounds, some from shamanist families and others from Christian families. There was a general knowledge and familiarity with traditional rituals, but most had lost the meanings of rituals. For example, the ritual of eating only hot rice and chicken soup after childbirth is an important tradition to the Hmong. Although most participants knew of this, they did not realize why it is done. While there is a divide between individuals who want to continue practicing traditions and those who do not, both groups are interested in keeping their culture alive through cultural education programs and language preservation.

Faculty sponsor: Lea Pickard

ROSE BRANTNER '10

No Species Differences Found in Relative Hippocampus and Septum Volumes Among Four Species of Food-Storing Birds

The relative size of the hippocampus has been shown to be related to spatial memory and food storing in two avian families, the parids and the corvids. Basil et al. (1996) examined North American food-storing birds in the corvid family and found that Clark's Nutcrackers have a larger relative hippocampus than Pinyon Jays and Scrub Jays. These results correlate with the nutcracker's better performance on spatial memory tasks and their strong reliance on stored food in the wild. However, Pravosudov & de Kort (2006) raised questions about the methodology used in the 1996 study, specifically the use of embedding materials and recalculation for shrinkage. Therefore, we calculated relative hippocampal volume based on standard methodology, embedding brains in gelatin, in four species of food-storing birds from the corvid family: Clark's Nutcrackers, Pinyon Jays, Scrub Jays, and Blue Jays. We found no

species differences amongst the four species in volume of the hippocampus. We also examined the relative size of the septum in these four birds. The septum shares reciprocal connections with the hippocampus, and in mammals, these connections are important in the acquisition and consolidation of spatial memory. We did not find species differences in relative septum volume.

Faculty sponsor: Kristy Gould

MICHAEL BYRD '10

Two Decades of Disillusionment: Examining the Growth of Chinese Anti-U.S. Nationalism from 1989 to the Present

The goal of this project is to explain developments in Chinese nationalism over the past two decades, specifically in regards to the ever-growing suspicion of America's international intentions. There exists an array of hypotheses, proposed not only by scholars but by politicians, journalists, and simple firebrands, each proposing a slightly different source for modern nationalist behavior in China. These hypotheses include the perspectives of both Westerners and Chinese, and can be loosely divided into three groups: those who believe Chinese nationalism is state-guided, popular, or the result of American behavior abroad. Before evaluating these positions I will briefly provide some theoretical background to nationalism in an effort to overturn several common preconceptions which make understanding nationalist movements difficult. I will then explain several characteristics of Chinese nationalism which distinguish it from Western nationalism and explain the impact this has on nationalist discourse. I will then proceed to evaluate the previously mentioned hypotheses and attempt to build some understanding of why Chinese nationalism has become increasingly hostile towards the United States.

Faculty sponsor: Rebecca Bowman

MARIA CARR '10

America Rejects a Fountain of Youth? Resveratrol and Pathogen Assessment in Native Grapes

Resveratrol (3,4',5-trihydroxy-trans-stilbene) is a celebrated antioxidant compound found in the skin of grapes and in the resulting red wine. Wine producers are marketing their wines based on strong evidence for its health benefits, pointing to the French paradox to underscore this notion. Pharmaceutical companies are selling resveratrol tablets as if it was the anti-aging answer. Even if the reports on its medicinal worth conflict,

people are buying it and, thankfully, its value isn't commanded solely by the fickle fashions of human consumption. Resveratrol production has been shown to decrease disease susceptibility of grape cultivars to devastating fungal pathogens (Gomes & Coutos-Thevenot 2009). Resveratrol is a phytoanticipin, a defensive chemical in plants that accumulates from preexisting constituents when stressed by microorganisms (Bavaresco et al. 2009). This study explores how conserved the expression of resveratrol may be among grape species preserved at Seed Savers Exchange Vineyards and its relationship to grape infection among several fungal pathogens. The goal is to inform others with the hope that unknowns like micronutrient content will be more carefully considered when selecting for cultivars in all areas of agriculture. It has shown how promotion of diversity can preserve what we are unaware we should be protecting.

Faculty sponsor: Eric Baack

ALLISON CROAT '12

Hamlet's Moral Agency: A Psychoanalytical and Ethical Response

Many people have accepted that Shakespeare's Hamlet suffers from Freud's Oedipal complex. This theory, however, does not take into account Hamlet's ability to think and act as a human, but focuses only on how his subconscious drives his actions. Although Hamlet's words reveal the powerful sexual tension he feels toward his mother, the tension does not stem from his subconscious, but rather reflects a displacement of his anger toward Claudius and, in essence, towards himself. As a moral human being, Hamlet acts upon reasoning that has been shaped by his morals. Freud would have us believe he reacts solely on subconscious desires, but this fails to take into account the moral agency Hamlet harbors. It is essential, then, to look at not only his subconscious as the reason for his lust, but also at the other, moral forces that shape Hamlet's actions and words.

Faculty sponsor: Kate Narveson

CULYNN CURTIS '10

Faithfully Transformed: A Bible Curriculum of Histories, Questions, and Applications

For many students at Luther College, the introductory Bible courses feel like a betrayal of their faith traditions and beliefs; some students experience what feels like a substantial faith crisis. Through my own experience, I have come to believe that rigorous academic study of the

biblical texts may lead to a deeper and enriched faith. Over the course of the academic year, I have spent time in conversation with pastors, youth and family ministers, and lay people; have studied developmental learning styles; have continued to engage in the academic study of the Bible (including biblical Hebrew); and have served as a peer mentor in an Introduction to the Bible course. From these experiences, I have developed a Bible curriculum geared toward high school students; the goal of the curriculum is to engage in academic study of the biblical narratives and provide a transformational experience for those who are engaged in the study.

Faculty sponsor: Kristin Swanson

PHUONG V. DAU '10

Solid State Synthesis of Cyclophanes

Cyclophanes are fascinating molecules owing to promising applications such as catalysis and fluorescence. Cyclophanes have been studied extensively, but they continue to pose synthetic challenges. To address these challenges, we have introduced a method to direct [2+2] photodimerizations in the solid state via hydrogen-bond-mediated self-assembly involving small molecules as templates. This method has allowed us to synthesize cyclophanes in the solid state stereoselectively with high yields. In this study, we show our approach to synthesize different classes of cyclophanes, including [2.2] para, meta and ortho cyclophanes.

Faculty sponsor: Claude Mertzenich

ABIGAIL ENDERT '10

Debating Quarantine during the Great Plague of London: Effective Preventative Measure or Death Sentence?

Public health policies of the 17th century focused on preventing the spread of diseases, sometimes at the expense of finding effective cures for the ill. The policies developed before and during the Great Plague of London in the 17th century focused primarily on prevention. Those infected with bubonic plague were often quarantined in their homes along with their family members. These individuals were often prevented from receiving care from doctors and priests. This practice received great attention during the Great Plague of London, including harsh critiques. This paper analyzes the practices used during the 17th century to contain the plague and how they were received by the educated public.

Faculty sponsor: Marvin Slind

LYNDA ERICKSON '10

Making Space for Every Body: The Case for a Women's Initiative

How comfortable are we in our skin? True wellbeing and life satisfaction depend upon being able to feel at home in one's body. Campus climate both reflects and affects students' attitudes toward body comfort and enjoyment. There may be pressure to hide or change oneself in order to fit in. Based upon our work as Nena Amundson research fellow and Luther Diversity Center intern, this project asks the question, "What can be done to bolster students' sense of safety, self-worth, and welcome here at Luther College?" The project explores ways in which academic departments and student service entities might combine forces to provide space for meaningful discussion about issues of embodiment, gender and sexuality in an atmosphere of honesty, respect, and responsibility.

Faculty sponsor: Wanda Deifelt

ANTONIA LLITERAS ESPINOSA '12

Universality of Human Rights

Are Human Rights universal? This question is in the mind of many philosophers, politicians and leaders in general all around the world. It is possible to find traits of human rights ideas in very different parts of the world such as China, India or traditional African societies. The world's major religions also promote ideas of egalitarianism and human dignity; for instance, the Hebrew Bible says that people should be their "brother's keeper." Nation-states play an important role in the implementation of human rights. World politics are, in fact, the main decisive factor on human rights legislation in different states. This paper will explore a brief history of human rights and traits of human rights ideas in different cultures and religions around the world, and it will analyze the role of modern politics in the implementation of such rights.

Faculty sponsor: Paul Gardner

ASHLEY EWING '10

Finding the Good: Aristotle's Use (and Misuse) of Homer in His *Nicomachean Ethics*

In his *Nicomachean Ethics*, Aristotle frequently refers to characters and incidents from the works of Homer. In particular, he uses the personality and deeds of the Homeric heroes to illustrate his ideal of moral virtue. Yet when the *Illiad* and *Odyssey* are put alongside the *Nicomachean*

Ethics, the reader sees immediately that the values and motivations portrayed in the ancient poems are starkly different from Aristotle's ideal of moral virtue. Furthermore, Aristotle seems to misinterpret Homer in several instances. In this paper, I will examine Aristotle's use of the Homeric epics, seeking to understand what the Homeric epics meant to Aristotle and how he makes use of Homeric ideals even when they seem to contradict his own moral theory. I believe this line of interpretation offers unique insights into the underlying concerns of Aristotelian ethics.

Faculty sponsor: Matthew Simpson

DAVID FARES '13

The "Bubble Effect" on Dialect: How the Luther Community Influences the Language We Speak

Does the "Luther Bubble" have an effect on the language we use? This study examines the effect that time at Luther has on one's original regional dialect. Research has shown that people who engage in shared activities come to talk alike. The question we asked ourselves was "Does this fit the 'Luther Bubble?'" Prior research also showed a correlation between gender and dialect variation, spurring our interest in the effect gender has on speech at Luther as well.

Faculty sponsor: Laurie Zaring

LAURA FULLER '10

The Importance of Being Ernest: Authenticity in Hemingway's Unique Blend of Fact and Fiction

Using scholarship and my personal, grant-funded travel to Michigan, I explore Hemingway's decision to transform his personal Michigan travel into fiction about a character named Nick Adams. Nick's fictionalized Michigan experiences mirror Hemingway's. From listening to Michigan natives, I learned that most of the characters in these stories have real-life counterparts and saw the accuracy of Hemingway's settings. Hemingway's choice to fictionalize is important in the context of travel literature, which generally commands factuality; writers lose credibility when they stray from fact. I establish *The Nick Adams Stories*' place in this genre. Hemingway's Nick Adams persona pushes travel writing's boundaries; I believe these stories represent an interesting vein of the larger genre. I explore Hemingway's reasons to fictionalize these travels. Hemingway wrote about invention and personal experience in *A Moveable Feast*, and the restored edition includes a

disclaimer that declares the book fictional, despite its appearance as a memoir. Likewise, there are contradictory notes concerning truth and fiction in the British and American publications of *Green Hills of Africa*. I conclude that Hemingway camouflaged some works as fiction because of his concern over reactions to his presentation of real people—most prominently himself.

Faculty sponsor: Mark Muggli

LINNEA JOY GRAFFUNDER '10

These Words Are My Unveiling: The Good Girl Speaks

As Simone de Beauvoir so famously argued, "One is not born, but rather becomes a woman." The process of growing up and making sense of gender expectations is a period of confusion and contradiction for many American girls, and through personal tumult we construct our identity as women. As we wade through the flood of information and messages that we receive about what it means to be a woman in our culture, we indirectly learn what it means to be a "good girl"—a socially approved and constructed feminine identity. In this collection of creative nonfiction essays, I explore how my experiences growing up and my identity as a feminist have taught me conflicting stories about femininity, desire, relationships, family, body image, and self-worth. In my writing, I place my own experiences as a girl growing up in America in conversation with feminist literature and theory.

Faculty sponsor: Amy Weldon

LAURA GRANGAARD '10

Through the Lens of Liberation: Implications of Liberation Theology for the Future of Interfaith Movements and the Interfaith Youth Core

Liberation theology and current interfaith initiatives hold much in common, particularly their approaches of consciously connecting reflection to action and their understanding of faith as integrated in everyday life. However, the practical effects of liberation theology in Latin America 20-plus years after it first took root do not always align with its ideology or teachings. Many participants in CEBs, the structural unit supporting a community of liberation theology, often fail to connect the Church to political or economic justice, as they are called to do. One reason for this is that, despite liberation theology's teachings, participants see religion as an entity apart from the world. Because of this, while they

may reiterate the dogma of the theology, they frequently are disconnected from an important element: action through the lens of liberation. Might anything similar occur with the interfaith movement? Using the Interfaith Youth Core as a model, this paper investigates key differences and similarities in the two movements, and asks if a Western understanding of what religion is “separable from other areas of life, including politics and economics” might have the potential, as in liberation theology, to undermine the IFYC’s effects if the issue is not consciously addressed.

Faculty sponsor: Wanda Deifelt

JASON HAGEMEIER '11

Deciphering Sustainability: Maasai Communities and Wildlife Conservation in Northern Tanzania

In recent decades wildlife conservation has become a top priority for Tanzania, an East African country renowned for its rich and diverse wildlife resources. At the same time Tanzania has experienced a growing agricultural sector, an increasing tourist industry and a booming human population. As a result of these competing environmental pressures, land-use issues and sustainability concerns are beginning to emerge in northern Tanzania. To complicate matters, the Maasai pastoralists living in the region have been heavily impacted by reduced access to traditional grazing lands and water sources for their livestock. It is not surprising, then, that a broader context of “sustainability” is becoming central to reconciling one of the country’s mounting controversies: Should Tanzania concentrate on supporting its people or on protecting its wildlife? Drawing from firsthand experiences and observations during a recent January Term abroad, this talk analyzes the tumultuous interplay between wildlife conservation measures, economic development, globalization forces, and the subsistence needs and practices of Maasai pastoralists.

Faculty sponsor: Lori Stanley

KOJI HAYAKAWA '10

Beyond the Ainu Ethnic Revival: The Politics of the Dying in Modern Japan

Two decades after the end of the Cold War, scholars and politicians continue to be puzzled by the shape, form, and content of contemporary global politics. Particularly, issues of identity and cultural recognition are debated vigorously in the light of globalization on the one hand, and the resurgence of ethnic nationalism on the

other. Is ethnic nationalism likely to proliferate worldwide in a global era? This paper emphasizes the politics of identity, in particular, struggles for recognition on the part of indigenous people. This qualitative case study will look at the Ainu in northern Japan, historically regarded as a “dying” or “assimilated” ethnic community, by the Japanese, and their recent attempts to regenerate their culture and ethnicity as a means to demand indigenous rights. My arguments will attempt to theorize how ethno-historical values are translated and politicized into an ethno-nationalist ideology in order to subvert the oppressive present situation. This research, therefore, aims to develop an understanding of the process by which the Ainu transform themselves from the former image of a “dying race” into an empowered indigenous nation.

Faculty sponsor: Rebecca Bowman

MALLORY HEINZEROTH '12

The Role of Traditional and Formal Systems of Education among the Maasai of Tanzania

Since their arrival in East Africa several hundred years ago, the Maasai pastoralists of Tanzania and Kenya have developed a successful adaptation to their savanna environment and maintained a strong and vibrant culture. The knowledge, skills, and values that are the key to their enduring cultural tradition have been passed from generation to generation through a system of informal education. As they progress from childhood to adulthood to the status of elders, Maasai acquire the knowledge appropriate for their gender and age through training they receive during major rites of passage and through life in their communities. Increasingly, however, Maasai recognize that traditional education must be supplemented by formal education if they want to successfully adjust to rapidly changing social, political, economic, and environmental conditions in the world around them. As more and more Maasai take advantage of primary, secondary, and even university education, many benefits are being realized. At the same time, formal schooling introduces changes and challenges that often prove to be problematic. In this presentation I will draw upon my recent January Term experience in northern Tanzania as I explore the benefits and drawbacks of formal education for contemporary Maasai.

Faculty sponsor: Lori Stanley

AMBER HENDRICKS '11

Shōjo Manga: Its History and Role in Contemporary Japanese and American Society

Manga, or Japanese comics, have been an integral part of Japanese culture for about a century and until fairly recently have remained somewhat unheard of by the rest of the world. Manga's long history has endured over the years and its current aesthetic is extremely influential in all aspects of the world of pop culture. The 1990s brought about a sudden mass import of manga into America. Coming from a culture with an extremely different history than the United States, manga contained ideas and storytelling techniques that, despite their many Western influences acquired in the past, appeared truly unique. Perhaps the most striking of its features was its massive market of comics for girls, known as shoujo manga, highly contrasting the male-dominated market of comics in the United States. The availability of this product that had essentially no American equivalent produced a fan base that saw Japan as an exotic, futuristic world full of magical girls and everything *kawaii* (cute), yet within its Japanese context it has much more serious undercurrents. The influence of shōjo manga in all aspects of modern media is immense, but its roles in both historical and modern Japan as well as the United States are radically different.

Faculty sponsor: Richard Merritt

JILL HUGHES '12

Seeking the Actualized and Authentic Self through Movement Study

The recognition and embracing of Inner and Outer Connectivity of the Self through movement can affect for the better the individual's "wholeness" and self-health. As postulated by Peggy Hackney in *Making Connections*, "Inner impulses are expressed in outer form. Involvement in the outer world in turn influences inner experience." I seek to make this idea more concrete and directly applicable to myself and interested people of all diverse movement histories through audience participation in written and verbal forms, as well as movement demonstrations performed by myself and aided by Luther professor Mark Muggli. I seek to differentiate between the identity natural to the self and body, and the identities that are adopted from social and cultural impressions. My research seeks to share a movement study which can offer one's own inherent somatic reality. I believe that welcoming Inner and Outer Connectivity through the lens of movement and

the self-awareness and self-honesty that such an idea requires, can lead to a healthier, more actualized and authentic self.

Faculty sponsor: Jane Hawley

JACOB JIPP '10

Changes in Heparan Sulfate Proteoglycan Gene Expression During Prostate Cancer Progression

Syndecan-1 (Sdc-1), a heparan sulfate proteoglycan (HSPG), is located on the outer membrane of many cells in the body. It is a cell-signaling mediator that is involved in a variety of activities, including growth, proliferation, migration, and adhesion. In certain cancers, the relationship between syndecan-1 expression and tumor progression has been determined. However, in prostate cancer, this relationship is still under debate. In this study, the expression profile of Syndecan-1 was determined in two different prostate cancer progression models: the LN4 model (comprised of LNCap, DU145, and LN4 cell lines) and the LNCaP model (comprised of LNCap, C4, C4-2, and C4-2B cell lines). In the LN4 cell line model, Sdc-1 expression increased 6.65-fold in the DU145 cell line and 3.32-fold in the LN4 cell line when normalized to LNCaP. In the second model, the C4, C4-2, and C4-2B cell lines showed Sdc-1 expression increases of 1.45-fold, 3.45-fold, and 3.32-fold, respectively, when normalized to LNCaP. This experiment has great potential applications to prostate cancer research. If a definitive relationship can be understood about this gene and its relationship to prostate cancer, it may potentially lead to new drug targets as well as new biomarkers for tumor progression.

Faculty sponsor: Marian Kaehler

EMMALEE JOHNSON '12

Creativity and Elementary Education: Lighting a Fire vs. Filling a Bucket

Traditionally, education focuses on external directives and testing the ability to memorize information—approaching learning mostly through uniformity and typically leaving creativity and individuality outside of the classroom environment. My research attempts to explore how cultivation of self-discovery and self-expression can lead to better behavior, along with more compassion for others and increased academic performance in elementary education. Creative and community activities can make connections for students, personalizing and deepening the learning experience. Identifying

feelings through different facets can help students to find and pursue their own interests. My research is guided by the following questions: How can critical thinking skills, creativity, and effective communication be nurtured and developed in the elementary classroom? What is our elementary educational system teaching? Does teaching to the test support learning? What is a passive learning environment? What is an active learning environment? Do rewards help students to memorize or learn? How can elementary schools create learning environments for body-brain integration? Theories and practices from this research were implemented at North Winneshiek School through my J-II Directed Research in January 2010, with Jane Hawley and the Th/D 185: Stubborn Light First Year Seminar. We facilitated readings, artistic and movement activities and outdoor play and invention education linking the 6 Energy Chakras on the Human Body to the 6 Pillars of Character. This experiential research provided different ways of understanding behavior and classroom roles, rethinking two major aspects of learning in our educational system.

Faculty sponsor: Jane Hawley

WHITNEY KELTNER '11
Breast Cancer Psychometrics

Issues of forgiveness are common concerns among patients seeking spiritual counseling, yet few appropriate measures exist to screen for forgiveness-related problems in patients. The purpose of these studies was to develop a brief, psychometrically sound multidimensional measure of forgiveness for use in research and spiritual care, assessing forgiveness of oneself and others, feeling forgiven by others, and feeling forgiven by God. Several self-report measures were completed by 178 participants. The construct validity of this measure was demonstrated using confirmatory factor analyses, and in three separate samples, its reliability and validity was further demonstrated showing expected correlations. In addition, a comparison of the measure with health assessments found that forgiveness of self and others and feeling forgiven by others was associated with less perceived stress, mental distress, and physical illness symptoms. Future studies will assess its validity in patient samples. Implications for research and clinical care will be discussed.

Faculty sponsor: Loren Toussaint

CHRISTINE KENNEDY '11

Calvino's *Invisible Cities*: The Connection between Italian History and Calvino's Fictional Cities

Italian author Italo Calvino creates a world of fantastical cities in his book *Invisible Cities*, a postmodern fairy tale written in 1972. Through conversations between Marco Polo and Kublai Khan, Calvino describes 55 imaginable cities visited by Marco Polo. Each city contains historical, social, economic, and political references to Italian history and more specifically to the Roman Empire. With each city and its tie to Italian history and the Roman Empire, Calvino portrays a fallible empire composed of fallible cities and leaves his readers with an understanding of his assertion in finding the divine empire and the perfect city. My poster will demonstrate how four of Calvino's cities reveal the connection Calvino is drawing between the illustrious Italian past and the imagined new world of his fictional cities.

Faculty sponsor: Lise Kildegaard

ANDREW LEFFLER '10

The Effect of No-Till Land Management Practices on Carbon Sequestration

Increasing levels of carbon dioxide (CO₂) in the atmosphere are exhibiting effects on the global climate and ecosystems worldwide. The role of agriculture in the flux of greenhouse gases in the atmosphere is quite significant, and since soil contains more carbon than the atmosphere, agricultural soils previously depleted of carbon can be viewed as a major potential terrestrial carbon sink. When agricultural soils are tilled, the decomposition of plant residue stimulates microbial activity, increasing the amount of CO₂ respired. But according to different land management practices, it may be possible to sequester carbon out of the atmosphere into agricultural soils without compromising yield. Previous studies have shown that soil under a no-till system is capable of sequestering carbon, while conventionally tilled soils are not. The objective of this study is to compare soil organic carbon levels in conventionally tilled fields and in fields that have been under no-till management for different amounts of time in order to determine the rate at which carbon is sequestered into soils under no-till programs. The study sites are of similar soil types with the same crop rotation in northeast Iowa. By examining the amount of organic carbon present in agricultural soils that experience conventional tillage and the amount

of soil organic carbon in agricultural soils that are at different stages in no-till programs, this study determines the potential amount of carbon that can be sequestered out of the atmosphere if conventionally tilled soils in northeast Iowa were converted to a no-till program.

Faculty sponsor: Laura Peterson

ERIN LUNDE '10

Into Thin Air on Thin Ice: Jon Krakauer's Multiple Roles as a Journalist, Climber, and Client in His Narration of the 1996 Everest Disaster

In May 1996, a dazed Jon Krakauer, working on a story for *Outside* magazine, reached the peak of Everest. Unlike nine others attempting to summit that day, he made it down the world's tallest peak alive. Krakauer's epic account of the Everest disaster, like other works of travel writing, raises questions about the narrator's portrayal of himself and others, particularly when other expedition members died and people demanded to know why. As Krakauer recounts the Everest tragedy and attempts to make sense of his own and others' actions that led to nine deaths, the narrator's self-presentation holds in balance the multiple roles he played on the expedition. Krakauer, a lifelong climber before becoming a journalist, had been sent by *Outside* magazine on an expensive guided expedition to report on Everest's commercialization; his tone is thus shaped by the fact that he is a client on a guided expedition he never could have financed if not for his role as a journalist. As a journalist, Krakauer's authority and duty to objectivity faces a number of constraints, including sensitivity to grieving families and the debilitating effects of high altitude. Krakauer's narrative stance also grapples with a clash of identities: his role as a climber, which demands the values of teamwork, loyalty, and self-reliance, conflicts with his role as a client on a guided expedition, which expects passivity under the guide's direction. My research focuses on Krakauer's self-presentation as a narrator balancing multiple roles as a journalist, climber, and client; despite the tension-filled relationships between the multiple roles, Krakauer maintains a sense of narrative integrity, ethicality, and humble authority. My work draws upon scholarly studies on mountaineering, theoretical works of travel writing, and a personal interview with a climber who has summited Everest.

Faculty sponsor: Mark Muggli

KIRSTIN MANGES '10

Epidemiological Analysis of Medical Outcomes Related to the Historic 2008 Flood in Winneshiek County, Iowa

Throughout the spring and summer of 2008, Iowa encountered extreme weather events, which have since been recognized as the worst natural disasters in the state's history. Heavy rains resulted in historic levels of flooding in the largely rural Winneshiek County in northeastern Iowa and presented major challenges to the local health-care system. This project sought to identify key medical concerns of rural communities following severe flooding, utilizing retrospective epidemiological analysis of the public health effect related to the 2008 flood on Winneshiek County. The project involved developing a historical surveillance technique and statistical method to compare the frequencies of five different medical diagnoses groups including select injuries, skin infections and rashes, and cardiac events during the non-flood and flood years. Compared to the non-flood years there was an increased frequency of injuries ($P < 0.00001$) and infections ($P < 0.05$) during the time period immediately following the flood at a local county hospital. Data from this study suggests that a longer period of crisis or a more severe disaster could require advanced planning to prevent a breakdown in local public health-care delivery systems. Identifying medical risk factors will aid other communities in future emergency medicine and disaster planning.

Faculty sponsors: Mark Eichinger, Penny Leake, Eric Baack

KELSEY MANS '10

The Socio-Political Implications of Fairy Tales: How This Genre Will and Has Changed the Way People View the World

In contemporary America, fairy tales are perceived as mindless entertainment for today's young generations. This genre uses magic and far off lands to entice the imaginations of young people, both in literature and film. However, due to these perceptions, we neglect to truly understand the genre of the fairy tale and the reasons it was primarily developed. Coming to light in late 17th-century France, the fairy tale genre was created in order to explain the world in a new way and to discretely offer criticism on the workings of society. Since this time, fairy tales have continued to reflect the society and time in which they were written. This study will try to prove how this genre functions as a social utopia

through the examination of various fairy tales, mainly focusing on the work of Enlightenment writers as well as on the modern-day film interpretations of their fairy tales. The social context of these time periods will be examined, considering those aspects of society that have ultimately driven our desire for a world other than our own—utopia. A strong emphasis will also be placed on the idea that although children find entertainment in fairy tales, the ultimate goal of this genre is to send a socio-political message to society that is meant to be interpreted and discussed by adults.

Faculty sponsor: Anne-Marine Feat

JUSTIN C. MARSCHALL '12

Perceptions of Control as Mediators of the Link between Religiousness and Obesity

Obesity is a critical national health problem. Despite the prevalence of this condition, little scientific work has addressed the potential role of religiousness in explaining obesity. What work exists has been limited by design and confounding problems. Theory indicates variables such as mastery and self-efficacy may mediate the effects of religiousness on health. The purpose of this study was to examine the causal role of religiousness in body mass and to explore potential mediators/moderators of this relationship. Data was analyzed from over 1,500 adults in the Americans' Changing Lives survey, across three time points spanning almost 20 years. Results of cross-lagged path models show a small but statistically significant effect of religiousness on body mass index. Causal mediation analyses explored the role of two theologically relevant variables: mastery and self-efficacy. The results provide greater insight into how and why religiousness is associated with health outcomes such as obesity.

Faculty sponsor: Loren Toussaint

LEAH MATHESON '10

Identity Crises in *Don Quixote* and the Resulting Bad Consequences

In *Don Quixote de la Mancha*, written by Miguel de Cervantes, the search for and adoption of a new identity among the characters is a reoccurring theme. This paper investigates the “journey of the identity” in Don Quixote, Sancho Panza, Grisóstomo, Cardenio, and Dorotea. Although these journeys are very different from each other in nature, they all have severe negative consequences upon adopting a new identity in common, ranging from utter disappointment to

extreme physical trauma. This, along with the complete lack of individuality among characters while trying to become unique and special, demonstrates the danger of trying to adopt an identity that is completely different from that which has been lived by up until that point. This paper also exemplifies how easily obsessions are developed concerning one's identity and how destructive this obsession and the death of the original identity are.

Faculty sponsor: David Thompson

DUSTIN MERIWETHER '10

The Organizational Effects of Prenatal Versus Pubertal Testosterone on Determining the Degree of Cerebral Lateralization

The data are not yet analyzed, but I hope to show a correlation between both prenatal and pubertal levels of testosterone (as measured by digit ratios and digit lengths, respectively) and cerebral lateralization in both rats and humans. In rats, cerebral lateralization will be measured as spatial memory in a maze task as well as cortical thickness; testing language lateralization in rats is not possible. In human subjects, lateralization will be measured by ACT scores (to test both language and quantitative abilities) and grades in a statistics course (a further quantitative measure).

Faculty sponsor: Scott Carlson, David Bishop

LAURA MOHS '10

A Noble Courtier, or Simply a Man? Etiquette and Gender in Shakespeare's *Much Ado About Nothing*

Courtesy or etiquette books of the 16th century were initially intended to prevent social climbers from obtaining nobility by defining the qualities of the ideal noble. Instead, they allowed for increased social mobility as more people gained access to the knowledge of the way in which social interactions ideally played out. In *Much Ado About Nothing*, William Shakespeare represents many of these social relationships, but he often undermines them for the sake of gendered relationships. Ultimately, male-female relationships are formed at the expense of the male-male social relationships touted by courtesy books. This paper will use New Historicism and feminist criticism to explore how courtesy books and *Much Ado About Nothing* interact and the ways in which the characters in *Much Ado About Nothing* act against the ideals set up by these books.

Faculty sponsor: Mark Muggli

TRENA MONTGOMERY '10

**Weaving Identities: The Never-Ending
Dialogue of Guatemalan Backstrap Weaving**

Cloth, a fabric woven together by many individual threads, holds the stories of past and present, the young and the old, and of war and peace. It carries a language that our world hardly hears anymore because the connection, the intricate relationship we as humans had with this simple material, has been slowly fading through the years. However, one culture has been known to carry this connection with them no matter where they are forced to travel. As a Mayan woman, you are meant to carry with you the stories of your ancestors, writing them in the fabric you create. These beautiful fabrics carry intricate designs and bright colors that create a narrative, a platform to voice past histories while reflecting the contemporary culture they live today. Gender, societal identity, status, exchange and modernization are all elements and messages reflected in these unique pieces of material, all expressing the hidden voices within. However, what happens to one who is forced to hide her identity, to learn a new way of living and moving that in no way mirrors the culture she was raised in? This is the story of one Mayan woman who left all she knew in order to find a better life for her family both in Guatemala and the United States. She carries the stories of all Guatemalan women, hoping to share them and make them known to the world she now lives. Her story and the stories of others are carried on as they continue to endure through their struggle, forever calling out, "I am Maya, we are Maya, and we will continue being Maya."

Faculty sponsor: Virginia Gibbs

ANANDITA MUKHERJI '10

**Transcendental Freedom: Exploring Hannah
Arendt's Ideas of Judgment in the Face of
Modern Totalitarianism**

Hannah Arendt is perhaps one of the most significant political thinkers in modern Western history. My paper explores the tensions between the Kantian and anti-Kantian strains of her thought, specifically in her ideas on social and political judgment. On the one hand, she wants to affirm much of Kant's conception of human reason, i.e. that there is one conclusion that everyone can come to if they think about it hard enough. On the other hand, she also has a very robust conception of the political sphere which she thinks should help define the conceptions of morality through real and open public discussions.

When discussing judgment on an individual and political level, this tension can cause extreme confusion. In *Eichmann in Jerusalem*, for example, Arendt blames Eichmann for being thoughtless, but if he was in a political situation in which he was doing the moral thing, then it seems logical that he should not be blamed. My paper will therefore attempt to reconcile these tensions by understanding what Arendt really meant by human reason, thereby constructing an alternative to deontology and consequentialism.

Faculty sponsor: Matthew Simpson

DEBORA MUKAZ '10

Ancestry and DNA Testing

The goal of our experiment was to determine the level of accuracy with which ancestry and race can be determined using DNA sequence analysis, more specifically mtDNA. We picked four DNA testing companies—the Genographic Project, DNA Familybuilder, DNA Heritage, and Family Tree DNA—to which we sent mtDNA samples obtained from cheek swabs of five consenting subjects from Central Africa, North America, Southern Asia, Asia, East Asia. Upon receiving the DNA test results, we examined them and made a summary of accuracy and consistency by comparing them to the subjects' family trees. Then, we compared the tests, the mtDNA regions used by the companies, and the results obtained. We assessed the advantages and disadvantages of using DNA testing to find out about ethnic and racial backgrounds; we also analyzed the socio-cultural relationships between DNA testing, ancestry and race.

Faculty sponsor: Marian Kaehler

HEATHER NELSON '11

**Phenotypic Characterization of Mutants
Exhibiting Altered Calcium Regulation in
*Vibrio parahaemolyticus***

Despite its regulatory roles in eukaryotes, little is known about the role of calcium in bacteria, or the mechanisms by which bacteria might sense and respond to calcium. *Vibrio parahaemolyticus*, a significant human pathogen, was chosen as a model organism for this research. *Vibrio parahaemolyticus* is a gram-negative marine bacterium that occupies environments having a range of calcium levels, including the ocean and the human gastrointestinal tract. Prior work has shown that calcium influences gene expression in *V. parahaemolyticus*, and multiple calcium-regulated lux (luminescence) reporter gene

fusions have been isolated. One strain containing a mini-Mulux fusion that exhibited dramatic induction by calcium was chosen to serve as a parent strain for Tn5 mutagenesis, in order to identify derivatives exhibiting altered calcium regulation. Fifty-eight Tn5 mutants were isolated that were “bright” (expressed luminescence) in the absence of calcium, and disrupted genes were identified. The goal of this work was to qualitatively and quantitatively characterize these mutant phenotypes. Forty mutants exhibited luminescence significantly higher than the parent strain, ranging from two fold to 937 fold. Mutants that exhibited more dramatic regulatory effects were defective in genes whose products were predicted to be transcriptional regulators, hypothetical proteins and metabolic enzymes. These data suggest that these genes may be involved in calcium regulation in *V. parahaemolyticus*.

Faculty sponsor: Jodi Enos-Berlage

STEPHANIE GRACE OLSON '10

Buboes, Saints, and Clouds: The Importance of Plague Images Created by the Black Death

When examining paintings created in response to the Black Death it becomes clear that certain images are repeated and emphasized. With the recurrence of the Black Death in Europe, especially during the 16th and 17th centuries, specific images and symbols became recognized as representing plague, specifically bubonic plague, and these images made a tremendous impact on the art world. But why were certain images more noticeable and powerful than others? These common Black Death icons were so popular because they represent how the people of Europe were united under a common threat, a threat so powerful that images of it were recognized by all, despite differences in culture and artistic styles.

Faculty sponsor: Marvin Slind

GRETCHEN PETERS '10

Reaction of Secochlorin Bisaldehyde with Hydroxylamine: Toward the Synthesis of Oxadiazepinonochlorins with an Unexpected Outcome

Is the replacement of a pyrrolic moiety in meso-tetraphenylporphyrin by a seven-membered ring possible? Our objective was to study the reaction between a meso-tetraphenylsecochlorin bisaldehyde and hydroxylamine and characterize the spectroscopic qualities of the free base and Pd(II), Pt(II), and Zn(II) complexes of the

reaction product. While initial spectroscopic evidence suggested that we were able to prepare the first example of a pyrrole-modified porphyrin containing a seven-membered heterocycle, further analyses proved this not to be the case. Instead, the known compound β -nitro-TPP formed along an as yet not fully understood reaction mechanism. The oxadiazepinone likely formed along a separate pathway as an intermediate toward a novel imidazoleporphyrin.

Faculty sponsor: Doug Schumacher

ADAM RAGHEB '10

Responses of *Arabidopsis* to Toxins from Invasive Spotted Knapweed (*Centaurea maculosa*)

Invasive plant species have wreaked havoc across native ecosystems, throwing them out of balance and displacing native species. One such invader, spotted knapweed, has disrupted fragile prairies across the United States. This species' success partially stems from the fact that its root exudates contain toxins which native plants cannot tolerate. Recent evidence, however, suggests that native plants show variation in their tolerance, and in fact might be able to evolve a tolerance to these invaders. The model plant organism *Arabidopsis*, susceptible to spotted knapweed, is used in this experiment to see if variation and possibly inheritance of tolerance in the presence of spotted knapweed toxin can occur. Discussion of further studies and applications of this project will be included.

Faculty sponsor: Eric Baack

MANASWINI RAMKUMAR '10

The AfPak Quagmire and the India Solution

Within two months of his time at the White House, President Obama focused on reorienting America's relationship with Afghanistan and in bringing out a fresh conduct in America's foreign policy concerning South Asia. The outcome of all his consultation sessions, with the governments of Afghanistan and Pakistan, with America's NATO allies, and with organizations such as the UN, Oxfam and Amnesty International, was the AfPak strategy. According to General James Jones, America's national security advisor, the strategy aims to bring a “new level of dialogue and a new level of discussion and consultation with all of [America's] friends and allies around the world.” Despite America's elaborate consultative process and its vision of involving its allies in the implementation of its key foreign policy

ventures, it seemed strange that the nation that has the most at stake concerning the efficacy of its policy was included neither in the strategy's formulations nor in its implementation. India was conspicuously absent from Obama's AfPak goals. This paper will address the efficacy of the strategy as it is currently being implemented and will suggest the policy changes that need to be brought about in order to include India's participation to strengthen the AfPak's efficacy.

Faculty sponsor: Rebecca Bowman

BRANDON REED '10

The Effectiveness of Sustainability Funds in Engaging Students at Liberal Arts Colleges

Although the sustainability movement is growing on college campuses, involvement tends to be limited to a minority of students. Sustainability funds are one way colleges have tried to engage more students, but they have met with only mixed success. Sustainability funds are created by colleges to provide monetary support for students, faculty, and staff seeking to implement environmentally, socially or economically sustainable projects on their campuses. Too often, however, these funds are run by college administrators or small groups of students, failing to gain broad student involvement. This project uses case studies to examine how sustainability funds at liberal arts colleges can be designed to better encourage student participation and promote sustainability education. First, interviews with students, faculty, and staff at four different liberal arts colleges are used to identify the reasons colleges establish sustainability funds and analyze the different ways these campuses organize and administer their funds. Second, the project explores the power of these funds to actively engage students on campus and compares the benefits they provide to the costs campuses must incur. Finally, the project offers recommendations for how colleges can better design sustainability funds to maximize student involvement and promote sustainability education.

Faculty sponsor: Steve Holland

PETER RUSSELLA '10

***Il était une fois*: Quantitative Content Analysis of 17th Century French Fairy Tales through The Lens of Evolutionary Psychology**

In modern psychology, new research methods are constantly being developed. Such is the case with the burgeoning interest in Quantitative Literary Content Analysis. This study uses

coding techniques intending to more concretely, concisely, and uniformly analyze literature than was possible in years past. Using the coding strategies of John Gottschall and the evolutionary psychological theories of David Buss among others, psychologists and other experts can now explore the previously untouched areas of literature in search of data that could reject existing theories. In this field, all works of literature are considered to be a snapshot of human psychology at the time they were written. When doing analysis through the evolutionary lens, ancient texts are as beneficial as modern ones simply because humans possess evolved psychological mechanisms that have not changed dramatically since the Pleistocene era. Many well known bodies of work have been explored with this process, such as those of Jane Austen and Homer. The focus of this poster presentation will be the yet un-mined work of French Fairy Tales. With their archetypal characters, fairy tales are an ideal source for an expression of human behavior. This presentation will focus on fairy tales of the 17th century, including the works of Charles Perrault, Marie-Jeanne L'héritier, Marie-Catherine d'Aulnoy, and Henriette-Julie de Castelnau de Murat.

Faculty sponsor: Anne-Marine Feat

GREG SHIRBROUN '10

Homeschoolers and the Transition to College

The current estimate of homeschoolers at the K-12 level in the United States is around two million (Isenberg 2007). This figure represents significant growth in homeschooling since its rebirth in the 1970s. Such growth has led naturally to a rise in the number of homeschooled graduates attending colleges and universities across the nation. Although these students are not an easily distinguishable minority, once identified there is a strong chance they will be stigmatized or bombarded with questions stemming from common stereotypes regarding their background. Romanowski has related some of these "myths" in his 2006 research. He concludes most people believe homeschoolers lack socialization skills, will become poor citizens, will struggle academically in college, and are always religious conservatives. Using these stereotypes as a starting point, the purpose of this research is to better understand the reality of homeschooling graduates' transition to college by conducting individual interviews with college students from homeschooling backgrounds. Upon gaining this understanding of the transitional experience, the

author will address the broader question of how colleges can deal with the increasing number of homeschooling students coming to their campuses and what students and administrations can do to best help them handle this transition.

Faculty sponsor: Brett Johnson

ERIC SIEVERS '10

The Effects of Plant Size and Spacing on Leaf Miner Damage in Eastern Leatherwood Populations

Eastern leatherwood, *Dirca palustris*, is a small shrub found in mesic-hardwood forests throughout the eastern and central United States. In the fall of 2009, I conducted a study in Twin Springs Park in Decorah, Iowa, to examine how the rate of *Leucanthiza dircella* herbivory is affected by plant size and distance to the nearest conspecific. My hypothesis was that low herbivory rates would be associated with increased distances between individuals and larger individual plants. A total of 40 leatherwood plants were sampled, and 393 leaves were collected. Ten damaged leaves were chosen from each plant with *Leucanthiza* damage. The leaves were analyzed for total area and damaged area using ImageJ software. All 40 leatherwood plants had mines. The average percent damage was 10.1%, and the mean damaged area was 2.4 cm². Neither plant size nor distance to nearest conspecific was a significant predictor of average area of leaf damage.

Faculty sponsor: Beth Lynch

KRISTA SOLIE '10

Nazi Indoctrination of the Youth: The Psychological Process of Gaining Future Support

For Adolf Hitler, control of the youth was essential to the implementation of his future plans for Nazism. In a speech on November 6, 1933, he said, "When an opponent says, 'I will not come over to your side,' I calmly say, 'Your child belongs to us already...you will pass on. Your descendants, however, now stand in the new camp. In a short time they will know nothing else but this new community.'" He wanted his policies to become permanent, and the only way to solidify Nazism was to gain the support of the upcoming generations. The Nazis understood the psychological impressionability of the youth during their development and capitalized on this to create a strong, future following. This paper will show that through education, propaganda, and youth groups, Hitler indoctrinated the

youth to support his regime in order to make the principles of Nazism everlasting.

Faculty sponsor: Marvin Slind

KIRSTEN STRANDJORD '11

Detection of Astronomical Events

The purpose of our research is to detect and model the detection of UV Ceti Stars in the field of M23 star cluster. UV Ceti stars are variable stars that experience flares and are often called flare stars. Five years of data has been taken of the field. Thus, our methods of detecting these flare star events and other stellar events rely on statistical analysis utilizing IDL programming language. Also, observations by the human eye are useful in detecting and confirming these events when statistical analysis fails. Preparations for allowing general public view-and-classify events are being made.

Faculty sponsor: Jeffrey Wilkerson

KAELA LOISE STUART '12

Forgiveness and Physical Health: Psychosocial Mediators

Forgiveness issues are common in spiritual counseling and clinical care, yet few brief, reliable, and valid measures exist to screen for forgiveness problems in patients. The purpose of this set of studies was to develop a brief, psychometrically sound multidimensional measure of forgiveness of oneself and others, feeling forgiven by God, and perceived divine forgiveness. One hundred seventy eight participants completed several self report measures including the instrument under development. The construct validity of this multidimensional assessment was demonstrated using confirmatory factor analyses. In three separate samples, the reliability and validity of the instrument was further demonstrated showing expected correlations with measures of forgiveness of oneself and others, feeling forgiven by God, and perceived divine forgiveness. Criterion validity analyses showed that forgiveness of self and others and feeling forgiven by others was associated with less perceived stress, mental distress, and physical illness symptoms. Further validation in patient samples is recommended.

Faculty sponsor: Loren Toussaint

KARISHMA SUSHILKUMAR '10

Construction of an Enlightened National Progress Indicator: The TESS Index

Policymakers use key national indicators to assess the progress of nations around the

world. The most popular method of gauging developmental progress and societal well-being is to use conventional indicators of economic conditions, e.g., GDP per capita, mortality rates, health indices. Consequently, each of those discrete indicators provides only a portion of the big picture often leading to over-optimistic or pessimistic estimations of the progress a given nation has actually made. The main aim of this project is to devise a new method of gauging a nation's level of progress that will provide a more holistic view by using four untested and unconventional measures. The resulting measures of world rankings will be contrasted with those suggested by other existing development indicators such as the real GDP. In the new index—the TESS Index—progress will be estimated by an analysis of four variables, namely, “pervasiveness of traffic etiquette” (T), “national spirit of entrepreneurship” (E), “habits of sanitation and hygiene” (S), and the “standard of living of farmers” (S).

Faculty sponsor: Steve Holland

AARON TAYLOR '10

A Statistical Analysis of the Men's NCAA Division I Basketball Tournament

Millions of people attempt to correctly pick all 63 games in the men's NCAA basketball tournament every year, and many know little or nothing about the teams. By studying statistical trends from the last five seasons and tournaments, I have created a model to help predict the 2010 NCAA tournament. The data I have collected from the past five years allows for teams in this year's tournament to be compared to tournament teams of the past in order to predict the success of this year's team. My model will yield the probability that each team will move on to the next round, based on their regular season statistics from that year. By comparing the teams' probabilities of success in each matchup of each round, one can make a more educated guess on who will win the game based on recent history.

Faculty sponsor: Paul Savariappan

TRONG THAI '13

The Use of Agent Orange during the Vietnam War

In 1962, Project Operation Ranch Hand was deployed all over Vietnam by the U.S. Government with two main purposes. First, it aimed to destroy the forest that provided cover for the guerrillas, and secondly, it aimed to pollute the food supply of the guerrillas in

Vietnam. From 1962 to 1971, nearly 20 million gallons of a toxic chemical called Agent Orange, which contained the most toxic chemical dioxin (TCDD), along with other herbicides were showered over Southern Vietnam. Although the U. S. denied the negative health effects associated with the use of Agent Orange in large quantities in Vietnam, this presentation will give evidence based on various studies from many scientists and researchers to prove that the U.S. Government was aware of the harmful effects that the use of Agent Orange would have on the Vietnamese people's health and the environment and address the continuing challenges facing its victims.

Faculty sponsor: Thomas Blanton

MARCUS TUREN '12

The Elusive French Body

French society is very concerned with appearances as popular examples such as Guiliano's “French women don't get fat” and Montignac's “The French Diet” suggest. This study will thus analyze assumptions, from medicine to morality, that inform French attitudes towards normative bodily aesthetics. Drawing on readings by Descartes, Merleau-Ponty, and Henry, we will particularly emphasize the construction of these fundamental assumptions that create categories of the “normal” and the “pathological” subjects. We will finally concentrate on the politicized status of French medicine as an agent of social control and regulation.

Faculty sponsor: Anne-Marine Feat

LAUREL WHITIS '10

Microcosm: An Artistic and Biological Exploration of Selected Human Microanatomy

The science of histology began in the middle of the 17th century when a man named Marcello Malpighi began to use the newly invented microscope to look at organic tissues. Malpighi and the other early histologists were artists as well as scientists, as over the next two centuries before the advent of the photograph, biologists of microanatomy recorded their discoveries by hand on paper. Countless sketches and drawings were produced. To this day, histology remains an art form, primarily in the field of photography. This dual presentation of artwork and research will display the beauty inherent in the world of the cell through a collection of oil paintings, as well as explore the early research done in the field of histology.

Faculty sponsors: Wendy Stevens, Benjamin Moore

KRISTI WIETecha '12

Hamlet and the Dead Fool's Lesson

In his exchange with Yorick's skull in Act 5, Hamlet, according to many scholars, continues to exhibit a bitter, indifferent personality; yet others argue that Yorick's skull is an outlet for philosophical growth. However, there is a third interpretation that enhances the power of the scene: Yorick's skull moves Hamlet to new emotional understanding. This paper argues that Hamlet's contemplation triggers not philosophical growth but emotional development. Yorick's skull serves as a tangible representation of the reality of death. Yorick additionally symbolically represents Hamlet's father's reign, giving Hamlet a chance to grieve at last. Although dead, the fool Yorick actually instructs Hamlet by showing him how to release genuine emotion. The difference between the compassionate Hamlet in this scene and the cold-hearted Hamlet who indifferently brushes off the deaths of Polonius, Rosencrantz, and Guildenstern reveals a new sign of maturity. Through Yorick, Hamlet's emotional perspectives begin to change and mature as he sheds his egocentricity in favor of emotional vulnerability.

Faculty sponsor: Kate Narveson

DANNY WILCOX '12

The Problem of Moral Stagnation: Reconciling Moral Subjectivism and Positive Progress through Justice

Scottish philosopher David Hume's moral subjectivism in general gives rise to pressing complications for a society concerned with such ideals as equality, tolerance and openness in the philosophical sense. My study will illuminate the practical difficulties in applying a subjective moral philosophy to a society driven towards a high standard of justice and the enforcement thereof. It will clearly show how such a moral outlook, in necessarily accepting as legitimate any unique understanding of societal well-being, may be dangerously construed to reduce justice to a neutral tool void of moral weight, unfounded and incapable of engendering social progress. Utilizing political philosopher John Rawls's redefinition of justice, my study will reconcile active enforcement of justice with a philosophical acceptance of subjective moral understandings. A thorough review of Hume's moral subjectivism will help to reveal why a redefinition is not only philosophically relevant, but necessary to maintain the moral validation of justice itself. Interpretation of both Hume's and Rawls's work will provide the necessary base

upon which to build such a reconciliation and thus will constitute a large part of the study. The second aspect of the project will show how these two works may be understood together and how this synthesis resolves the urgent conflict between moral subjectivism, tolerance, and an earnest pursuit of social justice.

Faculty sponsor: Joshua Kortbein

CHRISTINA WOOCHING '10

Influences of Prolonged Sitting on Low Back Pain, Gait, and Alignment

Low back pain is a prevalent concern of many Americans and continues to be an issue that limits people of all ages, adults, students and athletes from living a pain-free life. Luther College strives to promote overall health and wellness to their community members in many shapes and forms. Assessing the need for relief of low back pain in the staff, faculty, students and student-athletes of the Luther community would continue to further wellness at Luther College. The enthusiasm for this project derives from the interest of wanting to discover the prevalence of back pain within the Luther community and the desire to educate and assist people to make changes to relieve pain. Through research and observation over the summer, goals included assisting those who suffer from low back pain—assessing and improving alignment and gait by generating an achievable rehabilitation plan for those who show interest in continuation of improving their overall health by improving their alignment through exercise. The findings of this research provided to those of the Luther community ways to enhance their lifestyles and overall wellness with simple changes to reduce discomfort and pain caused by prolonged sitting and by improper gait and alignment.

Faculty sponsor: Brian Solberg

REESE WORTHINGTON '10

Scarab Beetles of Northeast Iowa

Scarab beetle (*Coleoptera: Scarabaeidae*) diversity in Northeast Iowa has never been assessed. Scarab beetles have major impacts on ecosystems as pollinators and detritivores, and are also major pests in turf grass and landscaping industries. The goal of this survey was to document the diversity of scarab beetles in four major habitat types in Northeast Iowa to better understand their ecological roles. Methods included collecting beetles with manure-baited pitfalls, black lights, banana-beer bait, rodent burrow pitfalls, and

general collecting on plants. We collected at 10 locations including tallgrass prairie, hickory/oak forest, pasture land, and mixed forest/grassland in Winneshiek and Allamakee counties. We collected 1,649 beetles representing 47 different species of scarabs. The most abundant species was *Ataenius spretulus* with 538 specimens collected. Black light trapping resulted in both the highest species richness and abundance for collecting methods. Ecological diversity was highest in hickory/oak forest and tallgrass prairie, which also had the greatest number of native species.

Faculty sponsor: Kirk Larsen

SARA ZANUSSI '10

**Music Is Worth More Than 99 Cents:
Mapuche Music and Cosmovisión**

The Mapuche are an indigenous people of Chile with a musical oral tradition. This project relates Mapuche music to the culturally important characteristics of integration, dualism and cyclicity. Although from a Western music perspective Mapuche music is theoretically and aurally simple, it is purposeful within its significance, which is intimately linked with its cosmovision, or worldview, of its people. Each instrument manifests a foundational role relating to Mapuche beliefs. Furthermore, interviews conducted with Mapuche natives and musicologists, as well as field observations of the We Foliche Amuleaiñ Mapuche community from April to July 2009 reveal sacred and secular implications of music coexisting with their lifestyle. The simplicity of the music enhances, rather than detracts, from the significance of Mapuche music. A contextual analysis of each Mapuche instrument demonstrates that the significance of music transcends the perception of its sound. Music cannot be fully understood without its cultural context, which extends beyond its theoretical frame. Mapuche sources confirmed the cultural inferences and explained experiences such as Mapuche New Year. In a globalized society, it is imperative that the Mapuche maintain their cultural identity through vital musical expression. A true appreciation of this music stems from its contextual meaning, rather than a 99-cent value on iTunes, a commercial acquisition. Despite globalization and the subsequent adoption of some western instruments, Mapuche music has not wavered from its roots in its cosmovision and oral tradition.

Faculty sponsor: Juan Tony Guzman

MITCH ZOELZER '10

**Fostering Forgiveness: An Examination into
the Effectiveness of Communal Forgiveness
Interventions**

Scientific research has extensively proven that forgiveness is positively related with physical and psychological well-being. However, the research to date often focuses on personal interventions. This presentation answers the question of the possibility of communal intervention and whether or not it is possible to foster forgiving traits through passive and active components of a "forgiveness blitz." This presentation will highlight the components of the 2010 Luther Forgiveness Blitz, examine its specific communal effects, and critically reflect on the general effectiveness and limitations of communal engagement with forgiveness.

Faculty sponsor: Loren Toussaint

COREY CHRISTENSEN '10, KARL
GILBERTSON '11, ANDREW HRVOL '10 ,
MORGAN AMES '11

**Self-Recognition in Clark's Nutcrackers
(*Nucifraga columbiana*)**

For many years, it was thought that only great apes could use a mirror to recognize a mark placed on an out-of-sight location on their body. Then two papers reported mirror-induced, mark-directed behaviors in dolphins and elephants. Finally, Prior et al. (2008) demonstrated this behavior in the magpie. Magpies are members of the corvid family, which includes many species of birds that are good at cognitive tasks. Two examples are the Clark's nutcracker, which has a tremendous spatial memory, and the Western scrub jay, which demonstrates episodic-like memory and future planning. Therefore, we were interested in whether these two species of birds might also show mirror-induced, mark-directed behaviors. We directly replicated Prior et al. with six Clark's nutcrackers and six scrub jays. We found two nutcrackers showed significant mark-directed behavior in the presence of a mirror when a colored sticker was placed on the nape of their necks, as compared to control conditions. None of the scrub jays in experiment one demonstrated this behavior. A second experiment was conducted after exposure to a mirror in the birds' home cages for one month, with one more nutcracker and one scrub jay showing significant mark-directed behavior.

Faculty sponsor: Kristy Gould

ADAM DANE '12, RACHEL CONWAY '12,
MARK FERNANDES '13, DANNY SMITH '13

Differences between American and French Youth Sports

The purpose and main focus of this research is to find the key differences between youth sports in different countries, specifically between the United States and France. There are a high number of youth sports in both countries, but the structures in which they are practiced are quite different (school vs. club, etc.). To make sure that this project is effective, we decided to focus primarily on the sports of football (soccer), rugby, and tennis. Also, we chose to look at these sports in each country with the categories of men and women as well as club and school. Finding much of the key information requires looking at the numbers of people who are licensed or registered for each of the sports. With the information provided from the research, one can more accurately assess the situation and draw conclusions as to the main differences between these two countries in sports, but also, more broadly, in education.

Faculty sponsor: Anne-Marine Feat

ERIN GREEN '10, JENS ERICKSON '12,
MADDIE FORD '13, KRISTEN SCHULTZ '11

Nuclear Energy in France

Currently, France derives around 80% of their power through nuclear energy. Compared to the United States, which uses 20%, their reliance on this “clean” energy is quite heavy. This poster will present an overview of current reliance on nuclear energy and why France is more reliant on nuclear energy than the United States, and will explore the possibility of phasing out the heavy usage of nuclear energy and incorporating natural gas and renewable energy sources instead.

Faculty sponsor: Anne-Marine Feat

SYLVIE HALL '11, KIA JOHNSON '11

Waning Knowledge: Traditional Medicine in Maasai Culture

The Maasai pastoralists of northern Tanzania have extensive knowledge of local plants and their medicinal uses. In the past, this knowledge was passed from generation to generation through the traditional system of education. Children learned about Maasai medicine from their parents, older siblings, and community elders throughout their daily lives and during elaborate rites of passage to adulthood. Recently, however, knowledge of medicinal plants has declined due

to an increased emphasis on Western biomedicine and a lack of opportunity for children living in boarding schools to acquire traditional knowledge. This talk will elaborate on the current state of traditional Maasai medicine and the real and potential consequences of the loss of knowledge about medicinal plants. We will also outline a proposed summer research project, to be carried out in collaboration with a Maasai researcher, that will focus on the documentation of medicinal plants, their preparation and use.

Faculty sponsor: Lori Stanley

JULIE HANSON '10, BONNIE GARVENS '10

Identification and Phenotypic Characterization of Two New *Arabidopsis thaliana* Mutants

Arabidopsis thaliana is a model organism used to study plant genetics and development. To identify possible new mutants, we screened the M2 offspring of Landsberg erecta seeds (M1) that had been treated with ethyl methane sulfanate. A number of putative mutants in leaf development, flowering, pigmentation, and size were found; many of these mutants did not produce viable offspring. Two mutant lines with mutations in leaf development and flowering time, were studied further. The investigative work on the phenotypes of these two mutant lines using electron microscopy will be discussed. This research can help further our understanding of plant and organismal development.

Faculty sponsor: Kevin Kraus

PAIDEIA II: CYBERETHICS CLASS

Creative Projects in Cyberethics

It is the Age of Google and privacy is dead. All our friends are on Facebook, and no thought can be longer than 140 characters. The knowledge of the world is only a mouse click away, and I have nothing to hide online. The Paideia II course CyberEthics examined these and other claims about cybertechnology. As part of the course, students worked on a project that creatively explored issues in cyberethics. During this session, several projects will be presented.

Faculty sponsor: Sören Steding, Ryan Gjerde

AMANDA MORAN '12, WITH YOUNG ASSISTANTS OONAGH AHOUSE, SOREN DARLING, ANJA MADSEN, GRACE THOMPSON, ABIGAIL TOUSSAINT, MEREDITH TOUSSAINT

Creative Movement and the Young Artist Informance

Dance education for young artists primarily begins with specific stylized forms such as ballet, jazz, and tap. Information about awareness of self, space, and others; improvisational techniques; the body's skeletal system; range; and efficiency are often not introduced until the later (often adult) stages of dance education. Creative Movement and the Young Artist Research seeks to understand the effects of teaching basic body/movement information and tools for creative composition to artists in their early stages of development (ages 4–11). Anatomical terminology is presented and explored through improvisational movement, which encourages young artists to invent and express. Dance is approached as art, and dancers are treated as artists. Classes endeavor to encourage children to channel their energy and emotions through movement. The research seeks to develop new methods of teaching dance that best align with young artists' natural energetic and developmental patterns. Creative movement classes are inspired by the Movement Fundamentals curriculum of Luther's Theatre/Dance Department. This presentation of a creative movement class demonstrates the methods and outcomes of these teaching techniques.

Faculty sponsor: Jane Hawley

SKY MACKLAY '10, WITH LUTHER COLLEGE JAZZ ORCHESTRA

Mestiza: Jazz Composition

Mestiza is a multi-movement work that draws upon the jazz tradition to create a musical narrative chronicling a Guatemalan-American woman's exploration of her identity and place in United States culture. "Mestiza" is a term for a female descendant of indigenous Amerindians and European colonialists. She is an amalgamation of Amerindian, European, and African, the progeny of ancient cultures, colonized and enslaved. The blood of oppressor and oppressed is mixed in her veins. The flexible and dynamic jazz tradition allows the piece to embrace the intersubjectivity of disparate cultural views. *Mestiza* was especially influenced by both the philosophical content and the writing style of Gloria Anzaldúa's book *Borderlands: The New Mestiza* which

freely interweaves poetry and prose, fiction and nonfiction, Spanish and English, in order to depict the multi-layered, bi- or tri-lingual reality of the mestiza. The piece echoes Anzaldúa's narrative style musically by drawing from diverse musical languages such as blues, minimalism, third stream, and indeterminacy. Through hearing many voices, the mestiza develops a tolerance for ambiguity and contradiction. To quote Anzaldúa, she comes to the conclusion that "Because I, a mestiza, continually walk out of one culture and into another, because I am in all cultures at the same time."

Faculty sponsors: Juan Tony Guzmán, Brooke Joyce

JON SHRADER '10, KYA ANDERSON '10, AMIE HELLER '11, JOE PUTNAM '10, KATIE SCHAEFER '11

Framing of the Middle East: An Analysis of U.S. Media Coverage of Terrorism since 9/11

That the Western media are biased in issues regarding the Arab world is accepted as fact in the Middle East, though denied by reporters in the West. Edward Said has explained this phenomenon as "Orientalism" or creating an "other." Since the terrorist acts of 9/11, the U.S. media has increased its coverage of terrorism. Our research aimed to discover how terrorism has been covered in U.S. media since 9/11. We analyze media coverage of the 13 terrorist events that have occurred or been attempted on U.S. soil since 9/11. An analysis of print media (*New York Times*, *USA Today*, and *Washington Post*) and cable news (MSNBC, CNN and FOX) through content analysis and framing theory explains how domestic terrorists and international terrorists have been covered in U.S. media and argues Orientalism has created a cycle of media coverage focused on a culture of fear of the Middle East and Islam, while downplaying domestic terrorist acts. In essence, the U.S. is portrayed as a victim of "Islamic terrorism."

Faculty sponsor: Kimberly Powell

ANDREA OLDFIELD '12, MICHAELA BRAM '13

Stability and Mobility through Dynamic Alignment: A Dance Informance

The human body has developed over time to become an efficient structure, functioning in vertical form. Underlying this efficiency are interconnected patterns of stability and mobility. During our daily activities and over the course

of our lifetime these patterns can become inefficient. This is due to tension and stress, brought on through anxiety and habits formed by watching or mimicking others and their use of the body structure. Awareness of these stresses on the body and the structural path to efficient and dynamic alignment allows for ease of movement in the body, and the ability to make cognizant choices on how we can reestablish efficiency and interconnected movement patterns. We will present an informative, interactive dialogue on easeful alignment for the body. This demonstration of somatic practices will explain how skeletal aspects of the body stack and relate for efficient vertical alignment of the human body. We will invite the audience to engage in somatic exercises, which can be applied, through awareness, to one's own use of his/her body in daily life. This lecture will culminate in an improvisational dance performance informed by the body's dynamic alignment.

Faculty sponsor: Jane Hawley

SHAKESPEARE PERFORMED: ENGLISH-THEATRE/DANCE 261 CLASS

Shakespeare Performed: *The Winter's Tale*

Luther students regularly read Shakespeare's works in Paideia I and in other courses, but they don't often get to test the relationship between the read text and the performed script. This student performance of an abridgment of Shakespeare's *The Winter's Tale* not only exhibits the benefits of live performance but demonstrates the value of extended textual study as an accompaniment to performance. The production draws upon original performance practices in its emphasis on words and high-speed acting, and in its use of eclectic costuming, uniform house/audience lighting, and minimal sets.

Faculty sponsor: Mark Muggli

MUSIC 239 CLASS

Choral Singing in Namibia and South Africa

Choral Singing in Namibia and South Africa (Music 239) is a January Term travel course that promotes intercultural exchange through music. Twenty-four select students from across the college experienced much appreciation and joy in their learning and presenting of traditional Namibian and South African music in local languages, while sharing music from our Lutheran college tradition of choral singing. The comfort and hope communicated through song from Lutheran congregations in Windhoek,

Namibia, to Onandjokwe Lutheran Hospital and Oshigambo Lutheran High School in northern Namibia, to the Nyanga Zolani Center and township congregations near Cape Town, South Africa, to the Evangelical Lutheran Church of Capetown and St. George's Cathedral in Cape Town was deeply felt by singers and listeners alike. In addition to learning and presenting music, students visited cultural and historic sights and learned about partheid and the process of reconciliation. Integral to the experience was the writing of reflections in a daily journal. This presentation will offer selected music from the group's repertoire and exploration of the value of musical cultural exchange.

Faculty sponsors: Timothy Peter, Gregory Peterson

JENNIFER MCELLISTREM '10, CHRIS NEVALA-PLAGEMANN '11

The Effects of Local and Regional Factors on Late Holocene Fire Regimes in Northwestern Wisconsin

Our research investigates the forest fire frequencies of two contrasting sites on the northwest Wisconsin sand plain. The sites share similar climate history, but the sites differ in their soil quality, proximity to topographic fire breaks, and vegetation history. Lily Lake is in an area with many lakes and finer soils with oak-pine vegetation; Cheney Lake is in an area with few firebreaks, coarse soils, and jack pine vegetation. The objective of our research is to determine if fire frequencies over the past 2,000 years have varied within and between the two sites. We counted microscopic charcoal in sediment cores from Cheney and Lily Lakes. Fire frequency was estimated by identifying charcoal peaks that exceed long term average rates of background charcoal influx using Charster. Our results suggest that in both sites peak frequencies were higher ~1500–1000 cal. yr. BP and decreased during the Little Ice Age (~750–150 cal. yr. BP). In general, the magnitudes of charcoal peaks were greater in Cheney Lake, suggesting more intense fires. Our results suggest that regional fire frequency is influenced by climate changes but that local factors, including vegetation composition, soils, and firebreaks, may also affect fire regimes.

Faculty sponsor: Beth Lynch

KIRSTEN INDRELIE '11, JACOB WESSELS '11

The Role of Porphyrin Structure in Porphyrin-HSA Binding

The efficacy of porphyrin binding to human serum albumin (HSA) is critical to clinical use in photodynamic therapy (PDT). Several porphyrins were utilized to measure the effect of porphyrin structure on its binding to HSA. Two categories of porphyrins were utilized—porphyrins with a hydrophobic and hydrophilic side: Protoporphyrin IX (PPIX), Protoporphyrin IX dimethylester (PPIXDE), and Chlorin e6 (Ce6); and porphyrins with hydrophilic substituents on both sides: Hematoporphyrin IX (Hme), Hematoporphyrin IX dimethylester (HmeDE), and Deuteroporphyrin IX dimethylester (DPIXEG). The following methods were used for the analysis: Stern-Volmer quenching, fluorescence lifetimes, anisotropy, fluorescence binding, and homogeneous studies. The results indicate that PPIX, PPIXDE, and Ce6 bind to HSA efficiently, evidence that porphyrins bind strongly to HSA if they have a hydrophobic and hydrophilic side. Hme is thought to bind to HSA but likely to a lesser degree than the aforementioned three porphyrins. HmeDE and DPIXEG seem not to bind to HSA probably due to the lack of hydrophobic substituents.

Faculty sponsor: Olga Rinco

LILIANE ZEH MOTO '10, HANNAH HAAS '11, MARK KNOWLES '10, AIDHA MAJDHY '11, ELLEN MUM '12, JENNY ST. CLAIR '12

Evolution of French Rap as Culture and Its Impact on Inner-City French Youth

Considering rap as a medium to access hard-to-reach youth, our interest is to present the evolution of French hip hop from an entertainment medium to a movement that empowers new identities. The main objective is to take a fresh look at French rap as well as highlight the way new French artists are now using rap as a protest movement yet claim to derive from the idea of "Counter Culture." We will show how rap music, long seen as a threat to social order, now works as a reinforcement and an anthem of encouragement to the youth of the suburbs and thereby strengthens the French social system.

Faculty sponsor: Anne-Marine Feat

EMILY ROTH '12, DEBORA MUKAZ '10, RACHEL TANGEN '12, MARCUS TUREN '12, JESSICA ZENCHAK '13

Medical Aid in Times of Crisis: Médecins Sans Frontières in Haiti

On January 12, 2010, a 7.0 magnitude earthquake struck Haiti with disaster and the need for immediate medical attention and aid in the already densely populated and poverty-stricken capital city of Port au Prince. This disaster has raised questions regarding the Haitian health-care system as well as the most effective way to provide much needed aid to the "victims of war, natural disasters and epidemics." This research project will specifically analyze the work of the Swiss-based organization *Médecins Sans Frontières* (Doctors without Borders), which sent aid to the people of Haiti devastated by poverty, disease and natural disaster. Through this project the optimal form of relief will be analyzed to maximize the amount of aid provided.

Faculty sponsor: Anne-Marine Feat