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THE TWENTY-FIRST ANNUAL ELKIN R. ISAAC STUDENT RESEARCH SYMPOSIUM

ALBION COLLEGE

APRIL 21-22, 2010

SCHEDULE OF EVENTS

Wednesday, April 21, 2010

7:30 p.m. **Elkin R. Isaac Alumni Lecture: Kristen Neller Verderame, '90**
"Success or Failure: It Really Is Up to You"
(How Research and Critical Thinking Can Make or Break Any Business)

Welcome: President Donna M. Randall
Speaker Introduction: H. Eugene Cline, Professor of Philosophy
Towsley Lecture Hall/Norris Center 101

Reception immediately following the program
Mitchell Museum, Science Complex

Thursday, April 22, 2010

8:30-10:15 a.m. **Student Research Platform Presentations**

Forum #1 <i>Norris Center 100</i>	Forum #3 <i>Norris Center 102</i>
Forum #2 <i>Towsley Lecture Hall/Norris Center 101</i>	Forum #4 <i>Norris Center 104</i>

10:45 a.m. **Honors Convocation**
Goodrich Chapel

1:15-4:15 p.m. **Student Research Platform Presentations**
See locations for morning sessions.

4-5 p.m. **Student Research Poster Session**
Science Complex Atrium

7 p.m. **Joseph S. Calvaruso Keynote Address: Mira Nair**
"Between Two Worlds: An Evening with Mira Nair"

Welcome: President Donna M. Randall
Conferral of Honorary Degree: President Randall; Trisha Franzen, Associate Professor of
Women's and Gender Studies
Speaker Introduction: Chelsea R. Denault, '12
Goodrich Chapel

Reception immediately following the program
Bobbitt Visual Arts Center Lobby

ELKIN R. ISAAC ALUMNI LECTURE

Kristen Neller Verderame, '90

Kristen Neller Verderame is CEO of Pondera International, LLC, a consultancy she founded to assist corporate executives and boards with strategic planning and transformational and growth projects. She concurrently serves as principal and general counsel at the Laconia Group, Inc., based in Reston, Virginia. In this role, she provides consulting in the areas of security, corporate governance, government relations, and mergers and acquisitions.



Prior to founding Pondera in 2008, Verderame spent 10 years with British Telecom (BT) Group, PLC, eventually serving as vice president and general counsel for the company's U.S. operations, where she was a member of the management team. During her tenure with BT Group, Verderame headed the company's legal department and was responsible for procurement, security, and government sales operations. Verderame led a team that drove more than \$25 billion in acquisitions for BT. She also directed BT's lobbying and government affairs efforts in Washington, D.C. Before joining BT, Verderame was an associate attorney in the international trade practice group for the Washington, D.C. office of Dewey Ballantine.

Verderame has been actively involved in the network of British-American organizations in the U.S. and the United Kingdom, currently serving as the general counsel to the British American Business Council, the umbrella organization representing over 2,500 British and American businesses. Verderame also serves as the general counsel to the European-American Business Council, and as a non-executive director for UK Trade & Investment. She holds membership in the Federal Communications Bar Association, the American Bar Association, and the bars of the State of Illinois, the District of Columbia, the U.S. Court of Appeals for the Federal Circuit, and the U.S. Court of International Trade.

A political science major at Albion, Verderame graduated summa cum laude and Phi Beta Kappa with Albion College honors. She received her juris doctor from the University of Michigan Law School.

JOSEPH S. CALVARUSO KEYNOTE ADDRESS

Mira Nair

Mira Nair is the rare, prolific filmmaker who fluidly moves between Hollywood and independent cinema, making films that earn critical acclaim and touch the hearts of audiences around the world.

As a promising young filmmaker, Nair had two award-winning documentaries under her belt when her first feature film, *Salaam Bombay!*, received more than 25 international awards, including the Camera D'Or (best film) and Prix du Publique (most popular entry) at the 1988 Cannes Film Festival. Since then, Nair has worked with many of Hollywood's biggest stars on critically-acclaimed and popular films, including *Mississippi Masala*, *My Own Country*, *The Perez Family*, *Kama Sutra: A Tale of Love*, *Vanity Fair*, *The Namesake*, and the recent biopic, *Amelia*. Nair is currently developing a stage version of her beloved *Monsoon Wedding*, with an anticipated Broadway debut in 2011.

A longtime activist, Nair used the profits of *Salaam Bombay!* to create the Salaam Baalak Trust which for more than 20 years has directly impacted government policy on street children in India, along with caring for some 5,000 children annually in 25 safe centers. In 2005 Nair founded Maisha, which has educated hundreds of students from East Africa and South Asia in screenwriting and directing.

While enjoying success as a feature filmmaker, Nair continues to be active with independent cinema. She created her own production company, Mirabai Films, and has collaborated with fellow filmmakers to produce films focused on the aftermath of September 11 and social issues in India related to AIDS. Equally at home on the small screen, Nair's 2002 debut with HBO, *Hysterical Blindness*, earned a Golden Globe for star Uma Thurman, and three Emmy Awards.

Nair's next film project, an adaptation of Mohsin Hamid's bestselling novel, *The Reluctant Fundamentalist*, will be filmed in New York, Pakistan, and Chile, and is expected to begin production this year.

A native of India, Nair was educated at Delhi University and Harvard. She is an adjunct assistant professor of film studies at Columbia University and lives in New York City with her husband and son.



STUDENT PRESENTATION SCHEDULE—THURSDAY, APRIL 22, 2010

FORUM #1 – Norris Center 100

8:30	Kelyn Carlson, Angela Johnston (McCurdy)	Changes in Populations of Two Tanaid Crustaceans, <i>Discapsuedes surinamensis</i> and <i>Halmyrapsuedes spaansi</i> , Living in Mudflats on the Coast of Suriname, South America
8:45	Tim Cameron (Carrier)	An Investigation of Whether Fiddler Crabs Settle Selectively on Carrot Island, Beaufort, North Carolina
9:00	Allison Neumann (Bartels)	Systematics and Taphonomy of Microvertebrate Faunas from the Early Eocene of the Pinnacles, Green River Basin, Wyoming
9:15	Kathryn Wagner (Bollman)	Trigonometric Functions in the Biangular Plane
9:30	Melissa Light (Bartels)	Evolution and Systematics of the Eocene Alligator <i>Procaimanoidea</i>
9:45	Brittany Myers (C. Van de Ven)	Chemical Analysis and Comparison of White Mountain Aridisols Based on Vegetation and Rock Type
10:00	Allison Robbins (C. Van de Ven)	Riparian Change in an Expanding Urban Environment: A Study of Historic Habitat Change along the Truckee River
1:15	Mark Kluk (Kennedy)	Novel Brooding Calls and Hatching Time of Day in House Wrens
1:30	Wayne Bond (McCurdy)	The Anti-Predator Behavior of North American Plains Bison with Calves in the Presence of Wolves
1:45	Ryan Stowe (French)	Structure-Activity Relationships for a Small Molecule AIF-DNA Inhibitor
2:00	Nicholas Herrman (McCaffrey)	Magnetic Coupling of Substituted Bis-Phenoxy-Bridged Dimanganese Macrocyclic Complexes
2:15	Rebecca Putans (Metz)	Fabrication and Characterization of Supported Metallic Nanoscale Catalysts: Toward <i>ex situ</i> Remediation Technology
2:30	Matthew Zaborowicz (Rohlman)	Optimization of the Fluorescent Labeling of Substrates for the <i>Tetrahymena</i> and <i>Twort</i> Group I Ribozymes
2:45	Rachel Leads (Albertson)	Behavioral Variation in <i>Drosophila</i> Due to <i>Wolbachia</i> Localization in Specific Adult Brain Regions
3:00	Erin Goldman, Kayleigh Pung (Olapade, Lyons-Sobaski)	Phylogenetic Composition and Diversity of Epiphytic Microbial Communities on Native and Invasive Plant Species
3:15	Bin Cai (French)	Synthesis and Evaluation of New Chiral Hypervalent Iodine Oxazolines
3:30	Kristina Weage (Metz)	Synthesis and Characterization of Palladium Nanoparticles on Functionalized Glassy Carbon
3:45	Seth Dawson (McCaffrey)	Multi-Step Synthesis of a Green Insect Pheromone
4:00	Matthew Logan (French)	Synthesis and Evaluation of Chiral Salen-like Hypervalent Iodine Compounds as Organocatalysts

FORUM #2 – Towsley Lecture Hall/Norris Center 101

8:30	Rudy Aronoff (Wickre, McCauley)	H.C. Westermann: Masculinity and the Social Matrix
8:45	Alex Freeman (Christensen)	“Fire in the Soul”: Exploring the Environmental Crisis through Drama
9:00	Anne Beyer (Chytilo, McCauley)	The Collector’s Hoard
9:15	James Goodnight (Ball, Jones)	Lee Actor’s Concerto for Timpani and Orchestra
9:30	Lucas Florin (Ball, R. Van de Ven)	Tomaso Albinoni: Oboe Concerto in D, Op. 9
9:45	Timothy Stevens (Rohlman)	Fluorescence Analysis for Group I Introns Using an ABI Prism 310 Genetic Sequencer
1:15	Mark Anthony Arceño (Morrow)	Traversing Time and Crossing Continents: Connections between Ancient Egypt’s Isis and Christianity’s Mary
1:30	Steven Maisel (McWhirter)	From Martyr to Dragon-Slayer: The Myth of St. George
1:45	Sean Thornton (McCauley)	Chaos Theories: Tapping into the Modern Music Industry
2:00	Lucas Florin (Abbott)	The Love Triangle: The Historical and Cultural Background of the Personal and Musical Relationships of Clara Wieck Schumann, Robert Schumann, and Johannes Brahms

2:15	Chelsea Grieve (Morrow)	Women with Swords and the Castration of Masculinity
2:30	Elizabeth Reimann (Wickre)	Maria Sibylla Merian
2:45	Lauren Ponta (Guenin-Lelle)	To Oxford and Grenoble and Back: <i>Réflexions sur une année à l'étranger</i>
3:00	Sabrina Sutherland (Mesa)	"Living in the Body": Poems
3:15	Elizabeth Schulhoff (MacInnes)	The Strange Case of Adaptations
3:30	Anna Williams (Shanton)	"Emma's Quest: A Children's Novel"

FORUM #3 – Norris Center 102

8:30	Rachel Champagne (Elichberger, Carlson)	Predicting Attitudes on Controversial Policies: The Role of Factual Knowledge about Human Development
8:45	David Mendrygal (Christopher)	Imposter Phenomenon: Genuine Feelings of Fraudulence or an Attempt to Preserve Fleeting Self-Efficacy?
9:00	Anthony Gorga (Rose)	Defending the Constitution: The Role of Executive Power in the War on Terror
9:15	Rebecca Friedrick (Pheley)	Personality and the Institution of Secrecy: Intelligence Reform in the Ford Administration
9:30	Adam Lomasney (Kanter)	Investigations and Solutions: The Mexican Drug War
9:45	Courtney Meyer (Cline)	Foreign Aid Does Not Aid Economic Growth and Development
1:15	Kris Doty (Jechura)	Use of Therapy Animals with Children to Improve Reading Skills
1:30	Alex Parker (Jechura)	Techniques and Analysis in Immunocytochemistry and Histology
1:45	Christian Bielski (Pheley)	Asymmetric Conflict and Its Effect on Nation States
2:00	Anthony Gorga (Kirby)	Aristotle and James Madison: Collective Wisdom and Political Experience?
2:15	Deondra Jacobs (Carlson)	Perception of Pregnant Teenagers: Effect of Ethnicity, Future Educational Success, and Need for Social Policies
2:30	Anthony McCoy (Wieth)	Sudoku: Memory for Digits and Irrelevant Information
2:45	Lindsay Carniak (Medina)	Harm Reduction: A Policy Approach to Keeping Injection Drug Users HIV-Free: A Case Study of Washington, D.C., U.S.A., and Buenos Aires, Argentina
3:00	William Armstrong (Pheley)	Analysis of Elections Involving Third-Party and Independent Candidates in the United States
3:15	Megan Roberts (Jechura)	Time-Dependent Spatial Learning in the <i>Octodon degus</i>
3:30	Corey McClain (Christopher)	Roommate Assessment and Social Informational Influence
3:45	Jackie Rollin (Wieth)	The Effects of Incentive Framing and Motivational Orientation on Proofreading

FORUM #4 – Norris Center 104

8:30	Jacob Rinkinen (Togunde)	Homogenous Faith, Ethnic Diversity: Desirable and Undesirable Traits in a Marital Partner in Nigeria
8:45	Mark Anthony Arceño (Ariza)	To Worship in One Voice? Monolingualism and Catholic South African Multiethnolinguistic Identity
9:00	Sandra Turay (Williams)	Long Live the Cedars of Lebanon: The Stories of Five Generations of a Lebanese Family in Three Nations
9:15	Erica Tauzer (Lyons-Sobaski)	A Case Study of Urban Ecological Analysis: The Phytogeography of Vacant Lots in Baltimore, Maryland
9:30	Kaylee Pope (Mullin)	Albion College and Sustainability
9:45	Mallory Fellows (Hagerman)	Expression of Femininity in the British Empire: The Significance of Femininity in England and India Revealed through Isabel Savory's <i>A Sportswoman in India</i>
1:15	Louis Kraus (Kanter)	Ser Bracero: The Mexican Perspective of Guest Worker Programs Inside the U.S. from 1951 to 1964

(continued on next page)

1:30	Kelli Chapman (Vaughan-Southard)	Mind-Body Connection: Exploring the Parallels between Yoga and Modern Dance
1:45	Kyle Kubitz (Chase)	Using GIS to Investigate the Trade and Settlement Networks of the Indus Civilization in Order to Identify New Areas of Archaeological Interest in Gujarat, India
2:00	Sarah Wenner (Vaughan-Southard)	Mimetic Alethia: Using Dance as a Catalyst for Archaeological Comprehension of Culture
2:15	Kelly Gentry (McIlhagga)	Authentic Assessment of High School Bands
2:30	Molly Carey (Webb)	How to Choose Repertoire: Modifying a General Education Assignment to Fit the Specific Needs of the Choral Director
2:45	Ashley Peterson (Osborn)	Communicating in the Information Age: Examining Communication Apprehension and Changes in Media Use and Appropriateness
3:00	Nicole Simone (Baker)	Theory or Practice: Discerning a Better Way to “Teach” Leadership
3:15	Katherine Ross (Mullin)	A Tale of Two Enclaves: The Development and Disappearance of Two Spanish Enclaves in West Virginia during the Twentieth Century
3:30	Katie Meier (Berkey)	The Hawaiian Sovereignty Movement: Reconstructing the Native Hawaiian Identity
3:45	Albion/ESCIA (Crandell)	Student Entrepreneurial Exchange (SEE): An International Partnership
4:00	Elizabeth Sylak (Chase)	An Examination of Jesuit (Iconographic) Rings from the Fort St. Joseph Site in Niles, Michigan

POSTER PRESENTATIONS – Science Complex Atrium, 4-5 p.m.

Aaron Bender (French)	Synthesis and Evaluation of a Novel Class of Salen-derived Hypervalent Iodine Reagents
Eric Bow (Rohlman)	Annotation and Structural Modeling of <i>Anabaena</i> Group I Ribozyme Variants
Becky Cotteleer (Kennedy)	Relationship between Probing Behaviors and Parasites in Nests during the Incubation Period of House Wrens
Nicole Depowski (Elischberger, Keyes)	The College Student as Scientist: An Examination of Scientific Thinking in Young Adults
Seth Goulet (Metz)	X-Ray Photoelectron Spectroscopy Characterization of Functionalized Molecular Monolayers for Metal Nanoparticle Deposition
David Mendrygal (Christopher)	The Imposter Phenomenon and Subjective Well-Being: The Mediating Effects of Conscientiousness
Christopher Omerza (McCaffrey)	Formylation of Substituted Phenols Using Microwave Irradiation
Courtney Pickworth (Christopher)	Conscientiousness Facets Predict Driving Risk-Taking, but Not Investment Risk-Taking
Erica Tauzer, Kaitlyn Pospiech (T. Lincoln)	Albion College’s Contribution to Climate Change: Calculating Campus Greenhouse Gas Emissions from 1990 to 2008
Qian Wang (Bieler)	Cavity Ring-down Spectroscopy
Christopher White (White)	Personality and Nest Defense in House Wrens (<i>Troglodytes aedon</i>) in the Whitehouse Nature Center
Alex Archer, David Budka, Kevin Markey, Mark Stevenson (Crandell)	Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords
Josh Freeland, Pat McCombs, Tim Wasmer, Thomas Worden (Crandell)	Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords
Ashley Hayes, Kasey Kaplan, Erika Nichols (Crandell)	Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords
Charlie LaNoue, Allie Lewis, Natalie Mikkola, Mallory Woodrow (Crandell)	Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords

ABSTRACTS OF STUDENT PRESENTATIONS**MARK ANTHONY ARCEÑO, '10****To Worship in One Voice?
Monolingualism and Catholic
South African Multiethnolinguistic
Identity**

Faculty Sponsor: Diana Ariza

Majors: French, International Studies
Hometown: Southfield, Mich.

At the start of the 2008 Advent season, English-speaking Catholics in South Africa found themselves using a “new,” or at least unfamiliar, language. The first of three sets of changes to the English translation of the Roman Missal



was implemented in South Africa, a nation in which the Catholic Church was one of the most recent churches to be established. The changes have caused much confusion, with many considering them “arbitrary,” as the rest of the English-speaking world continues to worship in what seems like another language. The Vatican has pushed to re-translate colloquial English versions of the Missal, which some have considered merely an interpretation of the original Latin text, into a standardized form more “faithful to the Latin.” These changes represent not only a question of one’s religious identity but, given the multilingual backdrop of South Africa, a question of one’s linguistic, as well as ethnic, identity. Does this standardized English nullify colloquialism and regional identity? How do these changes affect multilingual congregations which have little choice but to use this *de facto lingua franca* in their services? This ethnographic study addresses the complex ethnolinguistic identity of congregants and clergy in South African churches in order to more clearly understand the lingual and ethnic dynamics existing in the new South Africa. Relying heavily on firsthand interviews, participation in both monolingual and multilingual services, and analyses of non-traditional sources, this study diverges

from previous studies on language and ethnicity, situating itself within the context of the church. This preliminary research on a text that will not go into full effect until 2011 reveals split opinions on the necessity of the changes to the Roman Missal and what this may mean to one’s own identity.

Supported by: FURSCA, William and Gloria Sebald Gift

MARK ANTHONY ARCEÑO, '10**Traversing Time and Crossing
Continents: Connections
between Ancient Egypt’s Isis and
Christianity’s Mary**

Faculty Sponsor: Kara Morrow

Majors: French, International Studies
Hometown: Southfield, Mich.

Today, the cult of the Black Virgin is perhaps most recognized through imagery associated with the Black Madonna, the Virgin Mary of Orthodox Christianity (as well as of Roman Catholicism). Obscurity shrouding the Black Virgin persists, inciting questions as to who or what she represents, and from a stylistic perspective, why she is black. The answer may lie on a different continent and in a different age; indeed, some scholars regard the goddess Isis of ancient Egypt and Ethiopia as the “original” Black Virgin. Spanning centuries (from antiquity through the Middle Ages and into the Renaissance), the Black Virgin has undoubtedly made an impression on history. Utilizing a formalistic analysis of Isiac sculptures and paintings, I will juxtapose that imagery with imagery of the Virgin Mary and establish connections between the two women. Rather than focusing on the theology and mysticism of the Black Virgin, I will instead focus on skin pigmentation, the *lactans* state, and notions of the throne, which together connect these two important women in history.

ALEX ARCHER, '13

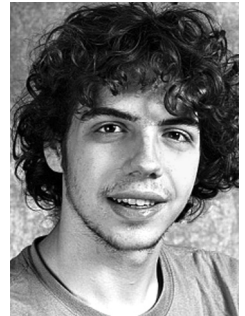
(See Google Online Marketing Challenge:
Optimizing Internet Marketing through
Google Adwords)

WILLIAM ARMSTRONG, '11**Analysis of Elections Involving
Third-Party and Independent
Candidates in the United States**

Faculty Sponsor: Alfred Pheley

Majors: Political Science, Biology
Hometown: White Lake, Mich.

George Washington was not in favor of political parties and warned against their dangers. They are not defined by the Constitution or enforced explicitly in law. Despite these circumstances, the two-party system has become a



determining force in our political process. This study used information from the 2008 election cycle to examine the impact of third-party candidates in select major races. All Congressional, Senate, and gubernatorial races in which an independent or third-party candidate received more than five percent of the vote were selected for inclusion. Races were classified into study groups based upon similarities in the candidate parties represented, type of office sought, and incumbency. Polling information was followed over the election cycle for each race to track trends and potential influential events associated with those trends. Polling information and potential mediating events are graphically presented to identify trends and patterns. Similarly, an examination of two elections from 2006 resulting in wins by independent party senators Joe Lieberman and Bernie Sanders permitted study of the trends and events from a historical perspective. Summaries and recommendations are included for future study on the influence of third-party candidates related to major elections.

*Supported by: FURSCA-Robert M. Teeter, '61,
Research Fellowship*

RUDY ARONOFF, '10

H.C. Westermann: Masculinity and the Social Matrix

Faculty Sponsors: Bille Wickre, Anne McCauley

Major: Art History
Hometown: Boyne City, Mich.

“H.C. Westermann: Masculinity and the Social Matrix” examines the graphic art work of American sculptor H.C. Westermann during the beginning of his career in the late 1940s and early 1950s. Exploring gendered notions of what it meant to be a male, a Marine, and an artist during the mid-twentieth century, his work is investigated in the context of the Chicago school of artists and within the broader framework of modern American art. The social constructs within which Westermann lived and worked are a basis for the interpretation of his early work. The collection of Westermann’s student and early works, on permanent loan to Albion College from Joel Leenaars, '58, lends a comprehensive visual inventory of his character and psyche. This collection gives us a glimpse into a part of Westermann’s life that up until now has been largely unexamined.



Supported by: FURSCA

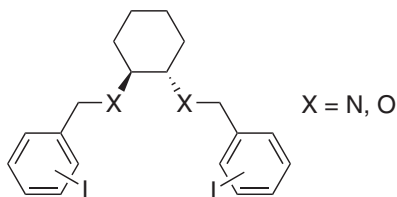
AARON BENDER, '11

Synthesis and Evaluation of a Novel Class of Salen-derived Hypervalent Iodine Reagents

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Shelby Township, Mich.

The synthesis and evaluation of hypervalent iodine reagents in asymmetric catalysis and synthesis have been of interest to the French research group for the past two decades. French has shown that chiral aryl iodides can act as organocatalysts in alpha-oxytosylations of enolizable ketones with modest enantioselectivity. Current research has focused on chiral, salen-like, bis aryl iodides. The synthesis of the novel bis aryl iodides will be presented along with the results of ligand oxidation and enantioselective alpha-oxytosylation reactions.



Supported by: FURSCA

ANGELA BENNETT, '12

(See Albion/ESCIA Student Entrepreneurial Exchange)

ANNE BEYER, '10

The Collector’s Hoard

Faculty Sponsors: Lynne Chytilo, Anne McCauley

Major: Art
Hometown: Birmingham, Mich.

For the culmination of my work as a bachelor of fine arts candidate at Albion College, I have created an art installation consisting of ceramic vessels, drawings, and found objects, and their relationship together. Often overlooked are the objects we interact with in our everyday experiences. I am interested in the life of a found object in nature both before and after I have personal experience with it. I am fascinated by the history of everything that I find, especially things that may have once served a purpose, but now are “useless.”



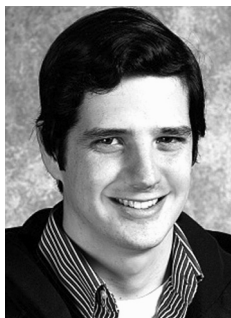
I never know where these things come from, so I try to capture the object’s essence, whether it is an insect carcass, my own hair, or a Petoskey stone. The objects that I study are of special interest to me, and I feel that if I do not preserve them in some way they may be forgotten. I try to accomplish this preservation through my explorations in ceramics and drawing. By using objects that once served a purpose I can include characteristics of the object’s uselessness with my functional artwork. This allows me to give each piece of ceramics extra life and history as it leaves my care and embarks on a life of its own.

CHRISTIAN BIELSKI, '10**Asymmetric Conflict and Its Effect on Nation States**

Faculty Sponsor: Alfred Pheley

Major: Political Science
Hometown: Grosse Pointe, Mich.

Since the U.S. escalation in the war against "terrorism," the public misperceives asymmetric conflict and its effect on the international community. Of primary importance is that terrorism falls under the umbrella of asymmetric conflict, because international terrorist networks use asymmetric tactics and aggression as a means to destroy the Western world. My thesis explores asymmetric conflict strategies and the role they play in different international relations frameworks.



The thesis concentrates specifically around the Polish Underground movement during and after the Second World War and the international terrorist organization Al-Qaeda. Both movements have had a serious effect on the international community, and highlight the extreme differences in how asymmetric conflicts affect the neo-realist framework internationally. The Polish Underground was a nationalist movement that tried to join in the neo-realist framework by using asymmetric tactics to restore the borders of its homeland, while Al Qaeda is an anti-Western movement that aims to dismantle nation states completely.

Asymmetric conflict brings to the forefront the battle between constructivism and neo-realism. It can be used to take a weaker power and raise it to a nation-state player, restoring a non-state actor to the neo-realist model. Though asymmetric conflict can be a force that restores nations, it also can be used to dismantle the international order. Culture then becomes the primary influence in obtaining power rather than power being held by the nation states. This research will help clarify the quote "one nation's terrorist is another country's freedom fighter."

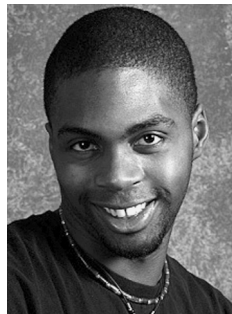
WAYNE BOND, '10**The Anti-Predator Behavior of North American Plains Bison with Calves in the Presence of Wolves**

Faculty Sponsor: Dean McCurdy

Major: Biology
Hometown: Portage, Mich.

The American bison (*Bison bison*) is North America's largest herbivore, and a fully-grown, healthy adult has no true natural predators. However, as calves, bison are susceptible to predators, including the gray wolf (*Canis lupus*).

This study examined anti-predator behavior of female bison and calves in the presence of gray wolves. Two socialized wolves were released at regular intervals into a specific area with a herd of bison that included females and their calves. Three aspects of behavior were examined in the presence of wolves: distance the female would allow a wolf between her and her calves, placement of the body of the calf relative to its mother, and identities of wolves that elicited aggressive responses from bison. Survey data from eight sets of encounters showed that females permitted an average of one body-length between themselves and their calves in the presence of wolves. Calves also tended to be placed near the mid-section of mothers, and bison tended to rush one specific wolf the majority of the time. These results suggest that bison are able to learn to evaluate the behavior of potential predators.



ERIC BOW, '10**Annotation and Structural Modeling of *Anabaena* Group I Ribozyme Variants**

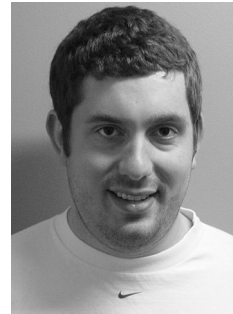
Faculty Sponsor: Christopher Rohlman

Major: Biochemistry
Hometown: St. Charles, Ill.

Over the past three decades, there has been increasing interest in the area of ribonucleic acid (RNA) biochemistry, due to the discovery of the multitude of roles RNA plays in the cell. These discoveries include the ability of catalytic RNAs (known as ribozymes) to catalyze metabolic reactions and the ability of "non-coding" RNAs (ncRNA) to regulate cellular metabolism and gene expression. Prior to these findings RNA was thought to serve merely as a stepping-stone in the classic expression of genetic material from DNA to RNA to protein. However, this more recent research has uncovered that RNA does much more than just code for proteins. Introns are linear sequences of RNA that are spliced out after their biosynthesis, or transcription, from a DNA template. RNA splicing is one of many RNA processing reactions that must take place before the RNA can be used in our cells.

Group I introns are members of a family of catalytic RNA that are capable of performing a range of reactions including self-splicing and the cleaving of RNA into two. This self-splicing reaction takes place in the cell without the aid of protein-based enzymes, which serve as catalysts in the majority of metabolic reactions. We utilize a modified version of the introns in order to follow the first cutting reaction involved in splicing. Therefore the RNA molecule serves as a catalyst and is called a ribozyme.

The goal of this work is to obtain insight into the folding and catalytic abilities of the *Anabaena* Group I intron in order to formulate a model structure. This Group I intron RNA comes from the cyanobacteria genus *Anabaena*. It is one of the smallest Group I introns known. Group I introns found in these organisms contain RNA sequences, which, prior research confirms, allow for cleavage and removal from neighboring RNA



sequences. To study the *Anabaena* ribozyme we are using biochemical methods coupled with computer bioinformatics. The cleavage patterns of the ribozyme can be studied using fluorescence-based assays to observe structural changes in the ribozyme. We have adapted JalView sequence alignment software to analyze and annotate specific sequences of the Group I catalytic RNA. The three-dimensional structure of *Anabaena* itself has not yet been determined. Our ultimate goal is to use the combined biochemical studies of structural variants and computational software to develop an accurate three-dimensional representation of the *Anabaena* ribozyme.

DAVID BUDKA, '13

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

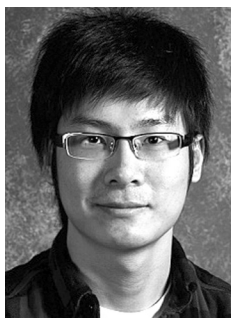
BIN CAI, '10

Synthesis and Evaluation of New Chiral Hypervalent Iodine Oxazolines

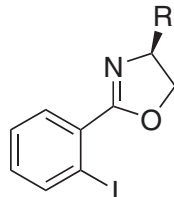
Faculty Sponsor: Andrew French

Majors: Chemistry, Economics and Management
Hometown: Suzhou, China

Hypervalent iodine reagents have been found to be versatile reagents in a wide variety of organic transformations, ranging from oxidations to functionalizations, polymerizations, and carbon-carbon bond forming reactions. They are of particular interest to us because they are much more environmentally sound than traditional heavy-metal catalysts in catalyzing organic reactions. My current study focuses on 2-iodo benzyl oxazolines, shown below. Oxazolines are compounds that have a five-membered heterocyclic ring. Chiral oxazolines have been widely used as chiral auxiliaries in reactions. Albert Meyers' four-step-one-pot synthesis allows for rapid synthesis of numerous differentially substituted analogs with acceptable yields. Thus, a number of different oxazolines can be synthesized and screened. More importantly, the nitrogen and oxygen groups in oxazolines will



have bonding interactions with hypervalent iodine. Results in this area will be discussed.



Supported by: FURSCA-James W. Hyde Endowed Student Research Fellowship

TIM CAMERON, '10

An Investigation of Whether Fiddler Crabs Settle Selectively on Carrot Island, Beaufort, North Carolina

Faculty Sponsor: Jeffrey Carrier

Major: Biology
Hometown: Woodhaven, Mich.

The fiddler crab (*Uca* spp.) has both a planktonic stage and an adult stage. During the planktonic stage, the larvae are swept out to sea by the currents. Once in the open ocean, they metamorphose into a juvenile stage and are carried by the currents back into the estuary where they settle at their respective sites. In this study, samples of both plankton and settlers of *Uca* spp. were taken from the Newport River Estuary in Beaufort, N.C. off the shores of Carrot Island. The samples were taken on three separate nights and the following mornings during previously specified conditions determined to be optimal for their collection. A multiplex PCR was used to replicate the ITS-IR gene found in the three species that reside in North Carolina, and gel electrophoresis was used to identify the species of each sample. A chi-square goodness of fit test was performed between the species distribution of the plankton and the settlers collected for each sample day and for the total sample. Analysis of the data showed a significant difference between the plankton sample and the settler sample at Carrot Island ($\chi^2 = 13.37$; $p < 0.05$). From these data it is shown that selective settling is taking place at Carrot Island by the *Uca* spp., though the mode of site selection is still unknown.



MOLLY CAREY, '10

How to Choose Repertoire: Modifying a General Education Assignment to Fit the Specific Needs of the Choral Director

Faculty Sponsor: Mark Webb

Major: Music Education
Hometown: Ann Arbor, Mich.

How to Choose Repertoire is a project that I began last fall to better understand how I wanted to teach. During my time at Albion College I have taken many education classes, and some of the material has been difficult to apply to my future goal of teaching choral music. One of my biggest concerns for teaching is how to choose repertoire for my choirs and how to distinguish between different arrangements of the same piece. During the Secondary Literacy Pedagogy class, we were given an assignment to evaluate a textbook, which inspired me to modify the assignment to make it more specific for choral music. Therefore I created a Repertoire Evaluation Form, using the same categories as the Textbook Evaluation Form provided by my course professor: practical considerations, target audience, content, learning aids, and cultural appreciation. I added the category, musical elements, to cover specific elements that are unique to music.



KELYN CARLSON, '10Major: Biology
Hometown: Grand Rapids, Mich.**ANGELA JOHNSTON, '11**Major: Biology
Hometown: Saline, Mich.**Changes in Populations of Two Tanaid Crustaceans, *Discapsuedes surinamensis* and *Halmyrapsuedes spaansi*, Living in Mudflats on the Coast of Suriname, South America**

Faculty Sponsor: Dean McCurdy

Studies on the demographics and reproductive biology of two tanaid crustaceans, *Discapsuedes surinamensis* and *Halmyrapsuedes spaansi*, living in three intertidal mudflats of Suriname, South America were performed in December 2008.

These crustaceans serve as primary food sources for migratory shorebirds that breed in the Canadian Arctic and overwinter in Suriname. Densities of *H. spaansi* were much greater than *D. surinamensis* (often >10,000 individuals m⁻² of mud versus <1,000 m⁻², respectively). Previous studies found that densities of *H. spaansi* were far lower than densities of *D. surinamensis*. Although prior studies likely underestimated densities of tanaids, differences in species compositions and densities could not be explained by differences in sampling techniques among studies. There was a female bias for the sex ratios of both species (2 females: 1 male approximately), and it was found that larger females were more likely to carry broods and the broods were of a larger size. Again, previous studies found a higher percentage of females to be ovigerous, but brood sizes were smaller. Initial studies on the reproductive biology hinted that females may be breeding synchronously, because females tended to carry broods in similar stages of development at each sampling site, and



Carlson



Johnston

molting in non-ovigerous females happened in a small time frame. Understanding tanaid demographics is essential in predicting population changes that could affect the mudflat community. Changes in the abundance and species composition of tanaid prey might negatively impact shorebirds that rely on these animals to fuel their migration from overwintering grounds in Suriname to breeding sites in North America.

Supported by: FURSCA-Bruce A., '53, and Peggy Sale Kresge, '53, Science Fellowship (Carlson), FURSCA-Orpha Leiter Irwin Research Fellowship (Johnston), Mellon Faculty Development Fund

LINDSAY CARNIAK, '10**Harm Reduction: A Policy Approach to Keeping Injection Drug Users HIV-Free: A Case Study of Washington, D.C., U.S.A., and Buenos Aires, Argentina**

Faculty Sponsor: Julia Medina

Major: Spanish
Hometown: Rochester Hills, Mich.

Even though they have distinct cultures, histories, and laws, both the United States and Argentine governments have made political decisions and legislation that affect the prevalence and incidence of HIV/AIDS in the population of injection drug users. I focus my comparative study on HIV/AIDS transmission through intravenous drugs in the capitals of the United States and Argentina: Washington, D.C. and Buenos Aires. By examining the laws and government initiatives related to HIV/AIDS and injection drugs, and the statistics of people with HIV/AIDS via injection drug use, we can evaluate the effectiveness of the enacted legislation in preventing the transmission of the virus. After investigation, it is evident that the politicians responsible for passing AIDS and drug law are influenced by the stigma associated with AIDS and drug use. In light of the aforementioned aspects of AIDS law, I propose that both nations adopt a new political framework to address the steadily increasing number of people contracting HIV/AIDS via



drug use: "harm reduction." Harm reduction establishes laws and programs to help drug addicts use drugs safely, putting an emphasis on health and rehabilitation rather than criminalization. Needle exchange and sterilization programs have been proven to reduce the incidence of AIDS and the number of drug users, but federal drug laws make such initiatives nearly impossible. With federal funding and support for harm reduction programs, we could advance public health and reduce the suffering of the thousands of people who contract HIV/AIDS through injection drug use annually.

RACHEL CHAMPAGNE, '10**Predicting Attitudes on Controversial Policies: The Role of Factual Knowledge about Human Development**

Faculty Sponsors: Holger Elischberger, Jacque Carlson

Major: Psychology
Hometown: Royal Oak, Mich.

Different factors influence people's attitudes about an issue, such as direct experience and education, making attitudes malleable (Perloff, 1993). Several studies have demonstrated that knowledge about controversial issues, such as capital punishment, can predict people's attitudes (Cochran & Chamlin, 2005; Haddock & Zanna, 1998).

The purpose of this study was to examine the extent to which college students' attitudes toward controversial social policy are linked to their knowledge of policy-relevant research in developmental psychology. For instance, we might expect to find that a student who learns about the detrimental effects of physical punishment on children may hold a favorable attitude on policies restricting the use of physical punishment by parents or in schools. We assessed participants' attitudes toward and knowledge of policies concerning the six areas of gay and lesbian parenting, adoption, parental leave, physical punishment, science curriculum, and sex education.

We found significant positive correlations between participants' knowledge and attitudes for all of the six areas except



parental leave ($ps < .05$), indicating that attitudes were in line with knowledge. Next, a series of hierarchical regression models was specified to test whether knowledge would predict attitudes above and beyond demographic variables, such as gender, religious affiliation, and political attitudes. These analyses showed unchanged significant contributions of knowledge in predicting attitudes ($ps < .05$). These findings are consistent with research linking changes in people's knowledge to changes in their attitudes (Guimond, 1997), suggesting intriguing possibilities concerning the role of education in attitudinal change.

Supported by: Mellon Faculty Development Fund

KELLI CHAPMAN, '10

Mind-Body Connection: Exploring the Parallels between Yoga and Modern Dance

Faculty Sponsor: Heather Vaughan-Southard

Majors: Political Science, Psychology
Hometown: Livonia, Mich.

My thesis examines similarities between yoga and modern dance with an emphasis on the mind-body connection. As a student interested in pursuing dance education, I find the mind-body connection especially important



when coaching dance students so that they are able to enhance the physicality of their performance. The use of breath phrasing, movement, meditation, and mind-body connection is examined physically and academically in works by various modern dance choreographers as support for my research. The choreographers, such as Doris Humphrey and Jose Limon, Martha Graham, and Isadora Duncan, are analyzed in terms of their movement style, philosophy of dance, and the similarities of these to yoga. My thesis determines which modern dance choreographer's philosophy best enhances a dancer's mind-body connection.

In addition to a written document, this research results in a concert dance piece that integrates yoga and modern dance. The process of creating this work is used to apply

my theoretical findings into the coaching and education of dancers. This tests the applicability of the dance philosophy that most successfully achieves a strong mind-body connection.

BECKY COTTELEER, '12

Relationship between Probing Behaviors and Parasites in Nests during the Incubation Period of House Wrens

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Antioch, Ill.

Cameras placed inside nest boxes of house wrens (*Troglodytes aedon*) show that females sporadically probe nest material during incubation. I hypothesized that probing is related to infestation of mites in a nest. Randomly



assigned experimental nests were regularly treated with Ultra Care™ Mite & Lice Bird Spray, a water-based pyrethrin insecticide, while control nests received equivalent applications of deionized water. During incubation, the interiors of nests were videotaped in 90-minute sessions. Tapes were scored for the number of probes and amount of time spent in the nest by each incubating female. As expected, probing rates (probes/min) were significantly greater in control nests than in experimental nests (control range 1.1 to 3.7, mean±SD = 2.6±0.80; experimental range 0.15 to 5.7, mean±SD = 1.7±1.8; Mann-Whitney U = 83.5, P = 0.034), indicating that pyrethrin treatment reduced probing behavior in nests. While there was no significant difference in hatching success of eggs in experimental and control nests, it is possible that any beneficial outcome of less time spent probing (higher hatching success or shorter incubation period) was countered by possible detrimental effects of pyrethrin.

Supported by: FURSCA-Jane Seymour Kilian, '39, Endowed Scholarship/Fellowship, Chickering Professorship

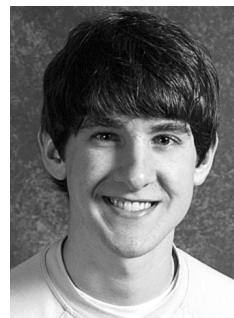
SETH DAWSON, '11

Multi-Step Synthesis of a Green Insect Pheromone

Faculty Sponsor: Vanessa McCaffrey

Major: Biochemistry
Hometown: Ann Arbor, Mich.

Pheromones are commonly blended into the insecticides used by large chemical companies such as Orkin and Terminix. These chemicals are used to lure the insects to the treated sites. One particular chemical, 2-phenethyl propionate, is derived from peanut oil and is used in "green" formulations. The synthesis of this pheromone was developed while attempting to create new laboratory procedures for undergraduate chemistry labs. Styrene (derived from polystyrene) is hydrated using hydroboration/oxidation, and the resulting alcohol is then esterified with either propionic acid or propionyl chloride. We have designed the procedure such that the reaction can be started at several different points depending on the desired length of lab time. Additionally, this project can be expanded to include cross-disciplinary study with biology to examine the effectiveness of the compound as an insect attractant.



Supported by: FURSCA-Orpha Leiter Irwin Research Fellowship

NICOLE DEPOWSKI, '10**The College Student as Scientist: An Examination of Scientific Thinking in Young Adults**

Faculty Sponsors: Holger Elischberger, Barbara Keyes

Major: Psychology
Hometown: Livonia, Mich.

Piaget's seminal theory charts the development of thinking as progressing from the sensorimotor stage of infancy to formal operations in adolescence and adulthood. Formal operations are characterized by abstract and logical thought, including the ability to isolate variables and test hypotheses. The present study focuses on the related, but broader construct of scientific reasoning that has its roots in formal operations. More specifically, the goals of the present study were to determine the relationship between scientific ability and attitudes toward science, to assess the relationship between scientific ability and creative thinking, and to examine the effects of changes in the specific wording of logic problems on one's ability to reason scientifically.

The results indicate a very strong positive relationship between scientific ability and scientific orientation, supporting previous research; those with a more favorable attitude toward science tend to perform better on tests of scientific reasoning. In marked contrast to previous research, there was also a positive relationship between scientific ability and creative thinking, which may, however, indicate that the instrument used to measure the latter may not be a pure measure of creativity, but also assesses verbal reasoning, as suggested by more recent research. Finally, a pattern emerged showing that students with much scientific training were less affected by whether a logic problem was worded abstractly or familiarly compared to those with less scientific training.

Supported by: Mellon Faculty Development Fund

KRIS DOTY, '10**Use of Therapy Animals with Children to Improve Reading Skills**

Faculty Sponsor: Tammy Jechura

Major: Psychology
Hometown: Grand Blanc, Mich.

Anecdotal and experimental evidence has shown that interacting with animals can have positive health effects on people. Simply owning a pet has been shown to lower blood pressure, increase good cholesterol, and decrease bad cholesterol, among other benefits. Animal-assisted therapy refers to the use of animals in the treatment of mental or medical difficulties while the patient and animal are under the care of a trained professional (Nimer & Lundahl, 2007). Many different clinical disorders have been found to be responsive to the use of animal-assisted therapy, including autism, schizophrenia, and post-traumatic stress disorder, among others.

The current research reviews literature pertaining to the use of animals in the treatment of people with various disorders, examines health benefits associated with interactions with the animals in general, and outlines the historical progression of this type of therapy. In addition, a case study of one therapy team, a therapy dog and its trainer/handler, is presented as an example of animal use in an elementary school setting.



MALLORY FELLOWS, '10**Expression of Femininity in the British Empire: The Significance of Femininity in England and India Revealed through Isabel Savory's *A Sportswoman in India***

Faculty Sponsor: Christopher Hagerman

Majors: Chemistry, History
Hometown: Jenison, Mich.

The historical study of women has recently focused on the importance of understanding how British women worked within society to either propagate or subvert the restrictions placed upon them by male ideologies, such as John Ruskin's "Angel in the Home." Yet, the writings of a late eighteenth-century female traveler, Isabel Savory, reveal unconventional perspectives on femininity within the British Empire and how women living in the peripheries of the empire impacted the perception of femininity back home in Britain. The societal differences between her homeland of England and the British society in India are crucial to this study. Building from Savory's own ideas of the way a lady should act, I researched the reactions of British men to the actions of "unfeminine" women in India through articles discussing her book to understand the dichotomy between the two different femininities practiced by British women on two different continents.



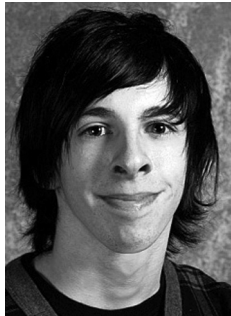
LUCAS FLORIN, '11

The Love Triangle: The Historical and Cultural Background of the Personal and Musical Relationships of Clara Wieck Schumann, Robert Schumann, and Johannes Brahms

Faculty Sponsor: David Abbott

Major: Music Performance
Hometown: St. Clair Shores, Mich.

Three important and dominant figures of the Romantic Period in music, Clara Schumann, Robert Schumann, and Johannes Brahms, provide a clear network of relationships and musical critique. As talented composers



and dear friends, these three engaged in a friendly rivalry. Through hundreds of musical examples provided by each composer, I hope to discover important nuances or similarities which tie the events of their lives to the musical dramas and beauty they write on manuscript. In theory, I hope to find musical similarities which may become subject to, but are not limited to, a "call and response" theme, common (if not identical) phrasing, similar harmonies, and even parallel melodies/rhythms/themes which may represent the daily lives and events seen by the composers. For instance, I will be researching the chronological events of each composer's life, and through a close study of their lives and behavior, I will search for patterns in their symphonies, lieder, sonatas, etc. In the realm of music history and musicology, the research on these composers is overwhelming. Using biographies written about these musicians as well as documented articles, diaries, and personal accounts which assist in understanding their music, my research will lead me to appropriately explain the parallels among the composers.

LUCAS FLORIN, '11

Tomaso Albinoni: Oboe Concerto in D, Op. 9

Faculty Sponsor: James Ball, Rebecca Van de Ven

Major: Music Performance
Hometown: St. Clair Shores, Mich.

Tomaso Albinoni (1671-1751) was a talented violinist and singer, who also happened to dabble in composition. Unfortunately, much of Albinoni's work and biographical information was lost during World War II in the bombing of Dresden and the destruction of the Dresden State Library. Throughout his lifetime of composing he produced over 50 operas and greatly influenced Johann Sebastian Bach. Bach was intrigued by Albinoni's work and not only used some of his themes to build fugues but also used his bass patterns to tutor pupils.

Among Albinoni's finest achievements were his oboe concertos and sonatas. He is thought to be the first Italian composer to utilize the oboe as a solo or virtuosic instrument as well as the first composer to publish these pieces globally.

The first two movements being performed are from Albinoni's Op. 9 collection written in 1722. The first movement, Allegro non Presto, features a lengthy string introduction, followed by the oboe's initial entrance with a stateliness of character. Throughout the remainder of the movement Albinoni plays with this style and at some points makes it flow into a beautiful lyrical melody. The second movement, Adagio, is the jewel of this concerto. The accompaniment offers a slow pulse for seven measures and then the oboe enters softly, rising above the pulse in a glorious fashion. The two movements, though drastically different, complement each other marvelously.

JOSH FREELAND, '11

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

ALEX FREEMAN, '10

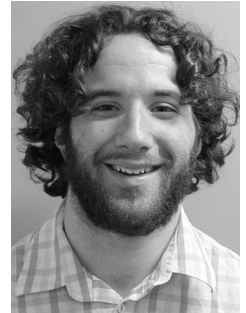
"Fire in the Soul": Exploring the Environmental Crisis through Drama

Faculty Sponsor: Nels Christensen

Major: Theatre
Hometown: Holt, Mich.

Prometheus, as the myth goes, stole fire from the gods and gave it as a gift to humankind. But was Prometheus' gift really a gift?

This project began with an important assumption: that fire, the first technology of humanity, was both a gift and punishment. A lot of modern technological innovation is done with the goal of "stealing fire from the gods." We create technology that is supposed to make our lives easier, usually with a disregard for the true impact that our innovations are going to have. And now, with the current environmental problems we are facing, this could be nature punishing us for stealing fire. My original play, "Fire in the Soul," presents a retelling of the Promethean myth as a way of exploring technology and punishment in contemporary culture.



REBECCA FRIEDRICK, '10

Personality and the Institution of Secrecy: Intelligence Reform in the Ford Administration

Faculty Sponsor: Alfred Pheley

Majors: Political Science, Music
Hometown: Alma, Mich.

The intelligence investigations of 1975 are often overlooked in the shadow of Watergate, but they signaled an important transition in the operations of U.S. intelligence agencies. When President Gerald Ford took office in August 1974, he was heralded as the nation's



healer after the nightmare of Watergate. Yet few people knew how deep the wounds were. Following the widespread criticism of the Nixon pardon, Ford was faced with another challenge when the *New York Times* revealed domestic wiretapping of American citizens by the CIA, among many other intelligence abuses. In response, Ford appointed his own commission to investigate the allegations, and Congressional investigations unfolded, with the goal of providing public scrutiny of our nation's intelligence actions.

Using this case study of the intelligence investigations, surprising institutional and personality influences on the Ford administration emerge. Within presidential studies, Ford's tenure is typically defined by his personal decency and moral background. However, in a closer examination of the documents, memorandums, and conversations surrounding the investigations contained in the Ford Presidential Library, the institution of the presidency overshadows his individual personality traits. The constraints of intelligence administration within foreign policy define this particular issue to support government secrecy despite the personal goals of the president and the openness of the political climate.

Supported by: FURSCA-Robert M. Teeter, '61, Research Fellowship

KELLY GENTRY, '10

Authentic Assessment of High School Bands

Faculty Sponsor: Samuel McIlhagga

Major: Music Education
Hometown: Romeo, Mich.

High school bands provide a challenge to many music educators in the area of student assessment. Music is a very subjective field, and because of that, music educators may have difficulties finding areas in which to assess students objectively. This study goes in-depth on the current practices of assessment for high school concert band students in southern Michigan and on creating a method of assessment that can be used in classrooms. The findings show that, although there are a variety of methods used currently in southern Michigan to assess



high school bands, the most commonly used methods include scale tests and musical selection tests, as well as attendance at concerts in which the student is performing and behavior and participation in class.

Supported by: FURSCA

ERIN GOLDMAN, '11

Major: Biology
Hometown: West Bloomfield, Mich.

KAYLEIGH PUNG, '11

Majors: Biology, Psychology
Hometown: Grand Rapids, Mich.

Phylogenetic Composition and Diversity of Epiphytic Microbial Communities on Native and Invasive Plant Species

Faculty Sponsors: Ola Olapade, Sheila Lyons-Sobaski

Generally, the composition and community structure of epiphytic bacterial assemblages are mostly supported by dissolved organic matter with exudates released by the plant hosts. However, these plant exudates, containing several phenolic compounds, may also serve as chemical defenses that may be inhibitory to some bacterial populations. In this study, several molecular approaches including nucleic acid (DAPI staining), fluorescent *in situ* hybridization (FISH), and 16S rRNA gene sequencing were employed to examine the phylogenetic composition and community diversity within the epiphytic bacterial assemblages on three selected native and invasive plant species, i.e., mayapple (*Podophyllum peltatum*), cow parsnip (*Heracleum maximum*), and garlic mustard (*Alliaria petiolata*), under field and microcosm conditions. Freshly collected plant leaves were incubated in triplicates for about a week within the reaches of the Kalamazoo River and Pierce Cedar Creek in



Goldman



Pung

order to compare differences in responses of indigenous bacterial populations to the plant exudates. Microcosm experiments were also conducted to account for various confounding factors that might be associated with fluctuating hydrodynamic conditions at the river sites. Results from the study showed no significant but slight differences in the response patterns of most of the phylogenetic groups examined on the three plants. FISH analysis indicated higher responses by bacterial members of the β -proteobacteria in the Kalamazoo River compared to those in Pierce Cedar Creek. While part of the results from the 16S rRNA gene clone libraries revealed the predominance of the β -proteobacteria and *Bacteroidetes* on mayapple, the bacterial populations within the assemblages on cow parsnip were significantly dominated by members of the β -proteobacteria, firmicutes, and the *Bacteroidetes*. Our future plan is to design microcosm experiments to quantitatively determine the minimum inhibitory concentrations (MIC) and/or minimum lethal concentrations (MLC) of extracted exudates from these plants.

Supported by: FURSCA-Orpha Leiter Irwin Research Fellowship, Beta Beta Beta

JAMES GOODNIGHT, '11

Lee Actor's Concerto for Timpani and Orchestra

Faculty Sponsors: James Ball, Stacey Jones

Majors: Music, Economics and Management
Hometown: Marshall, Mich.

Lee Actor's Concerto for Timpani and Orchestra was written in 2005. As a composer, Actor has won various awards for several of his works in the last few years. This particular piece was commissioned by the Palo Alto Philharmonic and is dedicated to timpani soloist Stuart Chafetz. Although the piece is only one movement in length, it is divided into three main sections. It starts with a quick section, set forth by a tempo marking of "Playful and Jazzy," followed by a slow and very flowing midsection, and then followed by another quick section that includes the cadenza. The rhythm that the timpanist plays in the beginning can be heard throughout the piece in



different variations, changing from sixteenth notes to sixteenth note triplets to eighth note triplets, but still keeping the same idea present. The cadenza includes timpani glissandi that allow the player to bring back the primary theme (first played by the orchestra at the beginning of the work) now heard on the drums. This statement of the theme builds slowly in volume and intensity until the orchestra re-enters once again with a reiteration of the opening of the tune. I will be performing the whole piece during the Isaac Symposium as well as with the Albion College Symphony Orchestra at some point during the 2010-11 season.

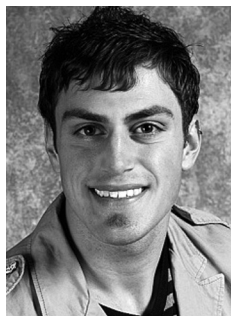
ANTHONY GORGA, '10

Aristotle and James Madison: Collective Wisdom and Political Experience?

Faculty Sponsor: Jeremy Kirby

Major: Political Science
Hometown: Farmington Hills, Mich.

When constructing his political philosophy, James Madison was no doubt influenced by a great number of thinkers, ranging from ancient Greece to the Scottish Enlightenment.



The purpose of this study, though, is to examine a potential connection in collective wisdom and political experience between Madison and Aristotle.

The research methodology is qualitative in nature, as it examines historical text and secondary literary source interpretations of Madisonian and Aristotelian political thought. Text citations from *The Federalist Papers* and Aristotle's *Politics* and *Nicomachean Ethics* are used to construct a case for collective wisdom and experience between the two thinkers.

When beginning the project, I was initially led to believe that Madison and Aristotle share similar interpretations of human nature. However, as I delved deeper into the material, I became convinced that they do not share a relationship of this kind. However, I am convinced that both men value a similar system of government and political society, which exists in the form of an elected representative government.

This project presents a fresh perspective on the origins of our republican thought, as ancient philosophy appears to take a backseat to Enlightenment thinkers on this issue. By examining Aristotle and Madison we can gain a greater sense of the variety of sources from which our system derives.

Supported by: FURSCA

ANTHONY GORGA, '10

Defending the Constitution: The Role of Executive Power in the War on Terror

Faculty Sponsor: William Rose

Major: Political Science
Hometown: Farmington Hills, Mich.

While I am intrigued by the president's role in American history, I am particularly interested in the role the executive branch has played in the twenty-first-century War on Terror. This project's purpose was to examine the constitutionality of the role the executive branch has played, specifically under the George W. Bush administration, in the conduct of this "new" type of war.

The methodology is strictly qualitative, and information was obtained through analysis of primary sources, secondary source material, and through personal interviews. The goal was to develop a comparison of two opinions on the actions of the Bush administration. Firstly, as a lawyer for the administration's Office of Legal Counsel, John Yoo wrote a series of memorandums, some of which were used to make the legal case for the constitutionality of wars in Iraq and Afghanistan, as well as for "aggressive interrogation techniques." Secondly, Louis Fisher, author of 19 books and over 400 articles on the constitutional limits of executive power, takes the opposite position. He maintains any military action taken by the president without the explicit approval of Congress is unconstitutional.

I conclude that the actions taken by the Bush Administration, from conduct of war to the implementation of enhanced interrogation techniques, were a misinterpretation and gross over-representation of the powers delegated to the executive branch under Article II, Section II of the American Constitution. This conclusion begs the question of how far we have strayed from the "original intent" of the framers of our most sacred document.

SETH GOULET, '12

X-Ray Photoelectron Spectroscopy Characterization of Functionalized Molecular Monolayers for Metal Nanoparticle Deposition

Faculty Sponsor: Kevin Metz

Major: Biochemistry
Hometown: Burt, Mich.

Analysis of molecularly modified carbon substrates is necessary to understand if deposition of metal nanoparticles onto the functionalized surfaces is possible. Due to the scale of reactions being performed, at the atomic level, specialized instruments are required to characterize these molecular monolayers.



An X-ray photoelectron spectroscope (XPS) is used to determine the presence of key atoms within the molecular monolayer to ensure that a chemical reaction has taken place and the monolayer was seeded on top of the carbon substrate.

Supported by: FURSCA

CHELSEA GRIEVE, '10

Women with Swords and the Castration of Masculinity

Faculty Sponsor: Kara Morrow

Majors: Art History, Anthropology
Hometown: Millersburg, Mich.

In the Western world, the sword acts as a phallic symbol that represents hyper-masculinity and the inversion of femininity. Specifically, a woman depicted with a sword takes masculinity away from the male, thereby threatening the "proper" gender dichotomy. The historical tendency toward such associations manifests in images such as *Judith Beheading Holofernes* by Artemisia Gentileschi and *Amazons Castrating Captured Pirates*



by Nicole Eisenman. Through an analysis of the imagery, one can begin to formulate the meaning behind the role of sexuality in contemporary television series such as *Xena: Warrior Princess*. Women who step outside their culturally prescribed duties are seen as taking on male qualities. Likewise, males who step into female roles also face certain social stigmas. The feminine characters of *Xena: Warrior Princess* embody elements of the ancient Greek Amazons in addition to contemporary notions of sexuality in order to create a hybrid woman known in scholarly literature as the "American Amazon." The lead women of *Xena: Warrior Princess* fight with swords and other phallic weapons creating an avenue through which cultural commentary manifests within popular culture.

Supported by: FURSCA

ASHLEY HAYES, '10

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

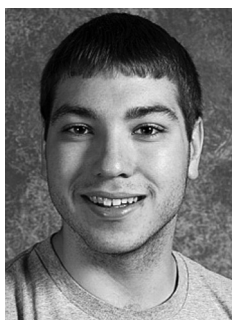
NICHOLAS HERRMAN, '12

Magnetic Coupling of Substituted Bis-Phenoxy-Bridged Dimanganese Macrocyclic Complexes

Faculty Sponsor: Vanessa McCaffrey

Majors: Chemistry, Biology
Hometown: Baroda, Mich.

Molecular magnets have been a very popular topic of research recently due to their potential applications in optoelectronics, information storage, and switching devices. However, before these materials can be used in these applications, a thorough understanding of how both structural and electronic perturbations affect magnetic exchange is needed. In order to systematically probe electronic effects, a series of bis-phenoxy-bridged dimanganese macrocyclic complexes was synthesized to determine the correlation between Hammett parameters of the substituent and the magnetic coupling of the compound. In addition to the synthesis of manganese compounds, preliminary results on vanadium complexes will also be presented. Vanadium



offers the benefit of having a lone electron in the t_{2g} orbitals, while the electron density of manganese is spherically symmetric. Both the synthesis of the complexes and the results from variable-temperature magnetic susceptibility measurements will be presented.

Supported by: FURSCA, American Chemical Society Petroleum Research Fund

SAM JABARA, '12

(See Albion/ESCIA Student Entrepreneurial Exchange)

DEONDRA JACOBS, '10

Perception of Pregnant Teenagers: Effect of Ethnicity, Future Educational Success, and Need for Social Policies

Faculty Sponsor: Jacque Carlson

Majors: Psychology, Ethnic Studies
Hometown: Nassau, Bahamas

America has one of the highest teenage pregnancy rates among developed countries (Darroch, et al., 2001). Past research has revealed that the effects of teenage pregnancy can differ for young mothers of different racial backgrounds (Furstenberg Jr., 1987).



In the current experimental study, we explored the public's opinion of this socially and racially sensitive issue. We examined four related topics: (1) what do people believe about the educational aspirations of pregnant teenagers; (2) what social policies do people believe should be in place to assist pregnant teenagers; (3) what do people believe are the main reasons teenagers become pregnant; and finally (4) how does ethnicity affect the opinions people hold of pregnant teenagers? To address each of these topics, we had 63 undergraduates read one of four vignettes (describing a black or white, non-pregnant or pregnant teenager). All participants were asked to complete a questionnaire assessing participants' educational opinions. However, only half of the participants were asked to complete a questionnaire assessing participants' social policies opinions and general attitudes about teenage pregnancy.

Our results indicate that the public is aware of the negative consequences of teenage pregnancy as it pertains to future educational success. Contrary to our prediction, the ethnicity of the pregnant teenager did not affect peoples' opinion on this issue. One possible interpretation is that participants responded in a socially desirable fashion when considering the educational success of a black versus white pregnant teenager. Future research using vignettes that do not present a favorable view of a pregnant teen is recommended.

ANGELA JOHNSTON, '11

(See Kelyn Carlson, '10, Angela Johnston, '11)

KASEY KAPLAN, '10

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

LINDSEY KEYES, '12

(See Albion/ESCIA Student Entrepreneurial Exchange)

MARK KLUK, '10

Novel Brooding Calls and Hatching Time of Day in House Wrens

Faculty Sponsor: Dale Kennedy

Major: Biology
Hometown: Jackson, Mich.

Video cameras were used to examine two behaviors of cavity-nesting house wrens (*Troglodytes aedon*): (1) the purpose of several novel brooding calls, and (2) hatching time of day. Research was conducted in Whitehouse Nature Center during summer 2009 using small audio/video cameras with infrared lights mounted on the inside of box lids to record behaviors of adult and nestling wrens during brooding of young hatchlings. Video tapes (90-480 min) were analyzed in the lab, and times and behaviors were recorded for each parental visit. Several types of vocalizations were given by adult wrens. Both male and female adults that entered boxes with food generally gave calls. We hypothesized that this call is a feeding call, given to announce



the presence of food to still-blind hatchlings. We predicted that this feeding call would not be given in the absence of food, that the call would elicit begging from the hatchlings, and that the occurrence of this call would decrease as hatchlings aged and could use other cues to detect parental visits. All of these predictions were supported. We also hypothesized that eggs would tend to hatch between 0800 and 1800h. Because house wrens are diurnal, hatchlings would be fed most adequately at the hours when the parents are most active. Our data supported this hypothesis as well.

Supported by: FURSCA-Robert J. Gardner Summer Research Endowment, Chickering Professorship

LOUIS KRAUS, '10

Ser Bracero: The Mexican Perspective of Guest Worker Programs Inside the U.S. from 1951 to 1964

Faculty Sponsor: Deborah Kanter

Majors: History, Spanish
Hometown: Ann Arbor, Mich.

In 1942 the United States offered a temporary guest worker program called the Mexican Labor Program. More commonly referred to as the Bracero program (bracero means manual laborer in Spanish), this bilateral agreement transported over four million Mexicans into the U.S. from 1942 until 1964. Most braceros spent from six weeks to a couple of months working on American farms, usually performing arduous tasks. Growers consistently defended braceros as ideal for this type of work. Growers simply believed Mexicans were willing and able to work jobs most Americans would not do.

Growers supported the idea that Mexicans, as non-white and non-citizens, could be paid less. Given that most braceros left home because of joblessness, growers saw Mexicans as accustomed to poverty. Thus, growers allowed for sub-standard wages, pitiful housing conditions, and less than nutritious food for braceros. Essentially, growers convinced themselves that braceros could



be paid less because they were already poor. Moreover, braceros seemed willing to tolerate abusive labor conditions.

My research seeks to reconstruct a bracero voice. Too often, braceros had no say in agricultural business decisions. The men neither controlled the type of crops they picked, the number of hours they worked, nor the deductions taken from their pay. Braceros were men without a community, literally transplanted across an international border, who sought to leave a mark. I interrogate false projections of Mexican workers and deconstruct myths in order to form an account faithful to braceros' experience and identity.

Supported by: Philip H. and Shirley Kennedy Battershall Scholarship

KYLE KUBITZ, '10

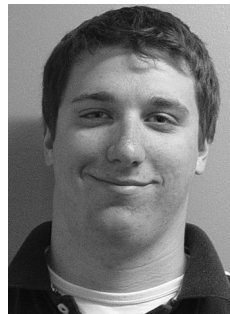
Using GIS to Investigate the Trade and Settlement Networks of the Indus Civilization in Order to Identify New Areas of Archaeological Interest in Gujarat, India

Faculty Sponsor: Bradley Chase

Majors: Anthropology, Geology
Hometown: Dearborn, Mich.

Gujarat, located in northwest India, is home to an incredible history of early human civilization. The amount of land covered by this civilization was larger than contemporary Egyptian and Mesopotamian civilizations combined.

The Indus civilization has its roots around 7000 B.C.E. up through 1300 B.C.E., thriving during 2600 B.C.E. and 1900 B.C.E. Early Indus civilization contained sporadic trade network connections among small settlements, but the size of these sites as well as their connections drastically increased and became more complex with the Integration Era of 2600 B.C.E. Trade networks were a vital component to the Indus civilization and necessary for its existence. Using a geographic information system (GIS), it is possible to analyze data such as digital elevation maps



and archaeological site locations to identify settlement patterns which can reconstruct the geography and networking of this region as it was during the height of the Indus. Analyzing these data also helps archaeologists to distinguish between coastal and inland archaeological sites which could serve a more useful purpose in understanding the Indus civilization than current categorizations of sites. Using defined coastal sites, approximate coastline reconstruction was calculated for Gujarat. Coastline reconstruction was then used to analyze connectivity between Indus sites via water-based routes which seem to strengthen possible trade routes and site connections. Ultimately, these analyses will specify areas with qualities which indicate high possibility of Indus settlement which archaeologists can use for thorough survey to locate new sites and further the understanding of the Indus civilization.

CHARLIE LANOUE, '11

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

RACHEL LEADS, '12

Behavioral Variation in *Drosophila* Due to *Wolbachia* Localization in Specific Adult Brain Regions

Faculty Sponsor: Roger Albertson

Major: Biology
Hometown: Farmington Hills, Mich.

Parasites alter host behavior in order to increase the rate of parasite transmission (Dobson 1988). In laboratory research, the fruit fly *Drosophila* can be used as a model organism to study host-pathogen interactions and to investigate the influence of the pathogen on the development of the host. The current study considers the interaction between *Drosophila* and the bacterium *Wolbachia*. A majority of research has focused on how the bacterium *Wolbachia* alters the reproductive processes of *Drosophila*. Less is known about the effects of *Wolbachia* on host behavior and the behavioral adaptations of the host to reduce the costs associated with infection. This study is unique because it analyzes how



Wolbachia induce host behavioral changes at both the organismal and cellular level.

Five populations of *Drosophila melanogaster* were collected. PCR analysis verified that each population was infected with *Wolbachia*. A portion of these populations were cured using the antibiotic tetracycline, allowing a direct comparison between infected and uninfected (cured) lines. The behaviors of infected populations and cured populations will be compared in order to determine whether behavioral differences exist between infected and cured flies. If behavioral differences are observed, these changes can be attributed to the presence of *Wolbachia* in the *Drosophila*. The next step is to analyze the brain of the infected flies to determine where the *Wolbachia* are localized. Testing will then be conducted to determine whether there is a correlation between behavioral variation in the fly and *Wolbachia* localization in specific brain regions. If a correlation exists, it is possible that *Wolbachia* are localizing in specific areas of the brain in order to change a specific host behavior which would promote parasite transmission.

ALLIE LEWIS, '10

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

MELISSA LIGHT, '10

Evolution and Systematics of the Eocene Alligator *Procaimanoidea*

Faculty Sponsor: William Bartels

Major: Geology
Hometown: St. Clair Shores, Mich.

Two species of the small Eocene alligatorid *Procaimanoidea* have been described in the past. The relationship between these two species and the relationship between *Procaimanoidea* and other alligatorids is poorly understood.

This study analyzes the previously described *Procaimanoidea* species and new specimens collected from the Wasatch and Bridger formations of South Pass, Wyoming. Skulls of the two *Procaimanoidea* species, *P. kayi* and *P. utahensis*, show uniform differences in their boney characteristics. The most dramatic of these are that *P. kayi* is characterized by having a frontal with a broad interorbital plate and a jugal that vertically thins posteriorly, while *P. utahensis* has a frontal with a narrow interorbital plate and a vertically subequal jugal.

It is most likely that the two *Procaimanoidea* forms are distinct and represent valid species. *P. kayi* was described from the early Bridgerian (Br1b), while *P. utahensis* was described from the later Uintan (Ui1). Specimens from this study show that the two species overlap temporally, so the differences cannot be ascribed to within-lineage evolution. Since sexual dimorphism is rare in crocodylians, it is unlikely that the differences represent males and females of the same species. Since all specimens are clearly assignable to one of the two forms, it is unlikely that the differences represent variation within a single species. Finally, the two morphologies can be identified regardless of the size of the individual, eliminating ontogenetic change as an explanation.

Procaimanoidea is distinct from closely related alligatorids by at least four autapomorphies of the skull alone.

Supported by: FURSCA, Taylor Undergraduate Research Fund (Geology Department), Langbo Trustees' Professorship, University of Michigan Museum of Paleontology

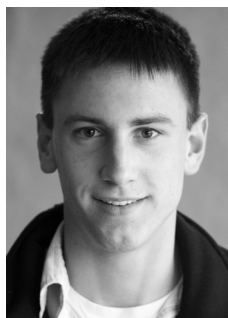
MATTHEW LOGAN, '10

Synthesis and Evaluation of Chiral Salen-like Hypervalent Iodine Compounds as Organocatalysts

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Brooklyn, Mich.

The synthesis and evaluation of chiral hypervalent iodine compounds as chiral transfer reagents have been of interest to the French research group for many years. Recently, French and Wirth have shown that chiral aryl iodides can act as organocatalysts in alpha-xytosylations of enolizable ketones with modest enantioselectivity. Current research has focused on chiral, "salen-like" bis aryl iodides (Figure 1) as a potential new class of



reagents. The syntheses and the evaluation of these compounds as novel organocatalysts will be presented.

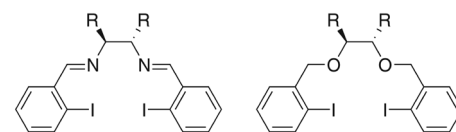


Figure 1. General structure of chiral "salen-like" bis aryl iodides of interest.

Supported by: FURSCA-Bruce A., '53, and Peggy Sale Kresge, '53, Science Fellowship, Mellon Faculty Development Fund

ADAM LOMASNEY, '11

Investigations and Solutions: The Mexican Drug War

Faculty Sponsor: Deborah Kanter

Major: International Studies
Hometown: Rochester Hills, Mich.

Since President Felipe Calderón's military intervention against narco-traffickers in the Mexican state of Michoacán in 2006, Mexico has been fully engulfed in a war between government forces and the highly powerful drug cartels that operate throughout the entire country. In the four years that the drug war has been raging, tens of thousands of lives have been claimed in addition to the collateral damage that has negatively affected the security of Mexican citizens and has raised questions about Mexico's legitimacy as a nation. Even with the unprecedented aggressiveness of the Mexican government and aid from the United States, the drug trade continues to thrive and see high profit margins.

This research was conducted to identify problems that plague Mexico and the United States alike and find viable policy solutions that can fix them. The primary areas of focus for this research are: the historical development of Mexico's political structure and drug history, the illicit drug trade, gun smuggling from the U.S. to Mexico, profiling of active drug trafficking organizations, and the current multinational policies that perpetuate the problems seen in Mexico today.

Supported by: FURSCA



STEVEN MAISEL, '10

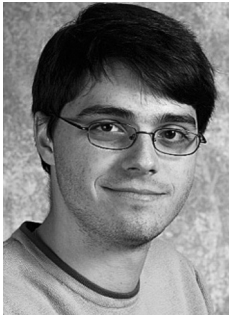
**From Martyr to Dragon-Slayer:
The Myth of St. George**

Faculty Sponsor: Jocelyn McWhirter

Majors: Religious Studies, Biology
Hometown: Grosse Pointe, Mich.

Since the earliest of religious traditions, humankind has been looking for ways to connect to and better understand the powers that be. Christianity's early years were marked with persecutions and boycotts. People who followed this tradition during these times needed inspiration and hope to continue, reassurance that their way of life was not in vain. From these circumstances arise myths of people doing great things or accomplishing great feats in the name of the Christian God. By tracing historical records and looking at how myths develop and change, one can understand the circumstances from which these myths arose. One can then decipher what roles they played in people's lives and what morals and lessons they were meant to portray. The myth of St. George provides an excellent example of this process. This presentation will explain St. George's evolution from a martyr to a heroic dragon-slayer and how this influenced the people who were hearing these myths firsthand.

Supported by: FURSCA



COREY MCCLAIN, '10

**Roommate Assessment and Social
Informational Influence**

Faculty Sponsor: Andrew Christopher

Majors: Psychology, Theatre
Hometown: Parma, Mich.

This study examined the sources of information about potential first-year college roommates and how these various sources influence perceptions of such potential roommates. Using both fact-based (roommate contract) and descriptive-based (roommate summary) information sources, the current study sought to explore perceptions of a potential college roommate. The Big Five Personality Factors (agreeableness, extraversion, neuroticism, conscientiousness, and openness) are basic personality dimensions that define an individual's unique personality and serve as the dependent variables for this study. It was predicted that the perceived level of agreeableness of a potential roommate would be influenced more than the other dimensions of personality by the source of information provided.

With a total sample size of 50 people, the current study used both a roommate contract (fact-based information) and a roommate summary (descriptive-based information). These were the independent variables. Both the contract and summary were manipulated to provide either positive or negative information categories about a potential roommate, resulting in a 2 x 2 experimental design. Participants then completed a personality assessment based upon the student they just read about. A between-subjects multivariate analysis of variance was conducted. Several significant effects were detected. As hypothesized, perceived agreeableness was strongly influenced by both sources of information.



ANTHONY MCCOY, '11

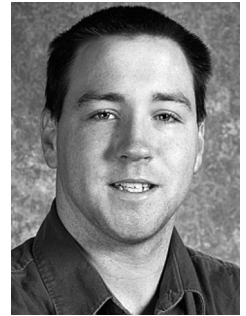
**Sudoku: Memory for Digits and
Irrelevant Information**

Faculty Sponsor: Mareike Wieth

Major: Psychology
Hometown: Albion, Mich.

This study was designed to determine the effects of task difficulty on explicit and implicit memory. Implicit memory is memory for information that is not consciously paid attention to; explicit memory is memory for information that is consciously paid attention to. Participants were given two easy and two hard Sudoku puzzles; puzzles were presented one at a time. Each puzzle was surrounded by a background which consisted of a newspaper-like article and Greek symbols. Participants had five minutes to complete the puzzle-solving task while memorizing both the given puzzle numbers and the numbers they were generating. After completing the puzzle, participants were asked to fill in a blank puzzle grid with the numbers they had been asked to memorize (explicit memory). After participants completed all four puzzles they were asked to complete the implicit memory task. Participants had to find a given Greek symbol in the background of each puzzle.

The results indicated that for easy puzzles participants remembered a greater proportion of generated than given information. For the hard puzzles, the results show that participants were able to remember a greater proportion of given than generated information. These results indicate that participants focus more on given information when the task is more difficult. The implicit memory results showed that participants found the symbols paired with easy puzzles more quickly than those paired with hard puzzles. This indicates that participants need to concentrate less on the easy puzzles than hard puzzles which leads to greater distraction by other information.



KEVIN MARKEY, '13

(See Google Online Marketing Challenge:
Optimizing Internet Marketing through
Google Adwords)

PAT MCCOMBS, '11

(See Google Online Marketing Challenge:
Optimizing Internet Marketing through
Google Adwords)

KATIE MEIER, '10**The Hawaiian Sovereignty Movement: Reconstructing the Native Hawaiian Identity**

Faculty Sponsor: Len Berkey

Major: Sociology

Hometown: East Grand Rapids, Mich.

Ever since Hawaii's discovery by the Western world and colonization by the United States, essential elements, such as property, language, environmental resources, education, government, and economic structure, that the Native Hawaiian culture thrives on have been disrupted. As a result, Hawaiians have struggled to sustain their culture as well as their identity.



The history and culture of Hawaii combined with its current social and political conditions have forced the Hawaiian people to question, recreate, and idealize their identity as Hawaiians. Concerns over their identity have driven Hawaiians to form the Hawaiian Sovereignty Movement with the ultimate goal of salvaging the identity they feel has been lost over the years. While those involved in the movement fall along a spectrum from advocating for Hawaii's complete independence from the United States to settling for governmental reparations for ethnic Hawaiians, the many organizations within the movement are fueled by the same goal of reconstructing the Hawaiian identity.

This thesis discusses why the struggle to reconstruct the Hawaiian identity is a social movement and how various goals, actions, and political pursuits of the Hawaiian Sovereignty Movement construct and reconstruct this identity. What are the themes that illustrate the goals of the movement's organizations? How do the common goals, actions, and political pursuits stemming from these themes preserve and recreate an "ideal" collective Hawaiian identity? Will the Hawaiian Sovereignty Movement be successful despite the United States' imperial claim over Hawaii?

DAVID MENDRYGAL, '10**Imposter Phenomenon: Genuine Feelings of Fraudulence or an Attempt to Preserve Fleeting Self-Efficacy?**

Faculty Sponsor: Andrew Christopher

Majors: Psychology, Economics and Management

Hometown: Dearborn Heights, Mich.

The imposter phenomenon (IP) is a motivational disposition in which highly successful individuals are unable to attribute their accomplishments to personal ability, crediting their achievements to either overriding situational circumstances (e.g., luck) or superficial character attributes (e.g., charm). This inability leaves many imposters feeling that their success has manifested itself into a fraudulent exterior, a guise that will eventually be uncovered and reveal this supposed pretense. As a result of this fear, imposters might believe that individuals within their social environment view them more positively than they perceive themselves to be; however, limited research has examined this potential discrepancy.



This study investigated the existence of this discrepancy, and whether or not this potential incongruity is particularly pronounced for certain dispositional characteristics. Participants (N = 116) completed several questionnaires concerning IP proclivities, three multi-dimensional indices that examined their subjective perception of themselves, defined as self-appraisals, and how they believed other people perceived them, defined as reflective appraisals. Additionally, participants completed measures that evaluated the extent to which they engaged in two prominent strategies of self-presentation. It was predicted that a significant discrepancy would be witnessed between the self and reflective appraisals of individuals scoring high on IP measures, and that this relationship would be mediated by the extent to

which these imposters engaged in self-presentational strategies.

Supported by: FURSCA-Jean Bengel Laughlin, '50, and Sheldon Laughlin Endowment for Student Research

DAVID MENDRYGAL, '10**The Imposter Phenomenon and Subjective Well-Being: The Mediating Effects of Conscientiousness**

Faculty Sponsor: Andrew Christopher

Majors: Psychology, Economics and Management

Hometown: Dearborn Heights, Mich.

The imposter phenomenon (IP) is a motivational disposition in which individuals experience feelings of fraud and inadequacy in the face of great success and achievement. IP has been shown to be associated with a host of depreciating attitudinal states, including increased anger, high levels of depression and anxiety, and lowered self-esteem. Although thorough research has been conducted concerning IP's depreciative effects on subjective well-being (SWB), scant research exists on the potential mediating mechanisms of this relationship. SWB has been found to be strongly correlated to measures of conscientiousness, which is how competent, efficient, organized, and dutiful a person is. My research examined if there were correlations between measures of IP and SWB, and if those relationships were mediated by the personality construct of conscientiousness.

A total of 330 participants completed indices of IP, SWB, and conscientiousness. Hierarchical multiple regression analyses revealed that imposter scores accounted for significant variability in both positive affect ($r = -.298, p < .001$) and negative affect ($r = .463; p < .001$), the two components of SWB. Additionally, conscientiousness was correlated with imposter scores ($r = -.493, p < .001$) and SWB (PA: $r = .445$; NA: $r = -.497; p < .001$). A Sobel test revealed that conscientiousness fully mediated the

relationship between IP and SWB, specifically with IP accounting for less variability in the affective components (NA: 6.3%, $B = 2.98$, $p < .001$; PA: 0.8%, $B = -.104$, $p < .001$) of SWB scores.

Supported by: FURSCA-Jean Bengel Laughlin, '50, and Sheldon Laughlin Endowment for Student Research, Faculty Development Committee

COURTNEY MEYER, '11

Foreign Aid Does Not Aid Economic Growth and Development

Faculty Sponsor: Gene Cline

Majors: Economics and Management, International Studies
Hometown: Prudenville, Mich.

Despite 60 years of promises and billions of dollars of foreign aid allocations, underdevelopment and poverty continue to exist. While distributions are made on the premise of alleviating hardships, actual allocations do not



follow such logic. Superior motives and faulty economic models ensure the continuation of check writing, even though studies prove that aid cannot increase investment, or more importantly, economic growth. Aid is found to increase dependency, encourage corruption, and erode policy environments. As the case study of Zambia demonstrates, economic progress will instead stem from self-development, economic liberalization, and the appropriate policy environment.

Supported by: SIT Study Abroad: Development Studies and Public Health Program

NATALIE MIKKOLA, '11

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

BRITTANY MYERS, '10

Chemical Analysis and Comparison of White Mountain Aridisols Based on Vegetation and Rock Type

Faculty Sponsor: Christopher Van de Ven

Major: Geology
Hometown: Northville, Mich.

The goal of this study was to evaluate how three plant species affect soil chemistry overlying two different types of bedrock in the White Mountains in California. The range is located in the rain shadow of the Sierra Nevada; consequently, the White Mountains experience a semi-arid climate, and the soils are dominantly aridisols. This study examined three plants that are common in the middle to upper elevations of the range: Great Basin sagebrush (*Artemisia tridentata*), mountain mahogany (*Cercocarpus ledifolius*), and bristlecone pine (*Pinus longaeva*). Soils for this study were collected from underneath each of these plants and from open ground on both granitic and dolomitic rock at elevations between 10,000 and 13,000 feet (3,000 and 4,000 meters). X-ray diffraction (XRD) confirmed that the soils were locally derived, as the dominant soil mineralogy parallels the dominant bedrock mineralogy. The differences in whole sample major and minor chemical compounds were compared between dolomitic and granitic soils, as well as between the three plant types and open space using X-ray fluorescence (XRF). *T*-tests and ANOVA were performed on the results ($p < 0.05$) to test the significance of the differences. Results showed significant dissimilarities between the two rock types for most chemical compounds. Only very subtle differences were found in the same samples when comparing vegetation. Results for soils collected underneath mountain mahogany plants consistently fell between the results for the open and bristlecone pine soils. This could suggest that bristlecone pine has a greater impact on soil chemistry than mountain mahogany.



Supported by: FURSCA-Harriett E. Elgin Science Fellowship

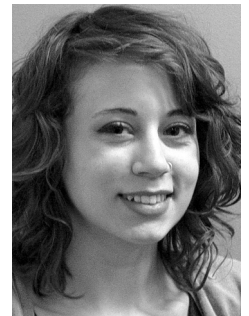
ALLISON NEUMANN, '10

Systematics and Taphonomy of Microvertebrate Faunas from the Early Eocene of the Pinnacles, Green River Basin, Wyoming

Faculty Sponsor: William Bartels

Majors: Geology, Biology
Hometown: Howell, Mich.

During the Eocene Epoch (starting at 55 million years ago) placental mammals underwent a second adaptive radiation in which the archaic orders of mammals were largely replaced by the earliest representatives of the modern mammalian orders that dominate today. The boundary between late Wasatchian (Wa7, Lostcabinian) and early Bridgerian (Br1a) North American Land Mammal Ages (NALMA) documents the first significant radiation or "refinement" within these newly appearing modern mammalian orders.



The Pinnacles localities in the northern Red Desert (Green River Basin, southwestern Wyoming) represent ancient river deposits of the Main Body of The Wasatch Formation underlying a major lake succession (Tipton Shale of Green River Formation). The Pinnacles contain the most fossiliferous localities of latest Wasatchian (Wa7) microvertebrate mammals and reptiles in the world and have dramatically expanded the known Wa7 fauna. These specimens were collected by prospecting, screen sorting, and microscope analysis of anthill concentrations of isolated teeth, jaws, and postcrania, which are imperative to the description of its ancient fauna.

The Pinnacles assemblage does not differ significantly from that of the Wa7 Lostcabinian Type localities in the Wind River Basin of Wyoming at the genus level.

At the species level, however, the diversity and abundance of lizards, snakes, and small mammals such as rodents, condylarths, and primates are quite different. Although some faunal differences between the basins were likely during the Eocene, dissimilar preservational conditions and collecting methods may explain most of the unique make-up of the Pinnacles assemblage relative to the Type Lostcabinian assemblage.

Supported by: FURSCA-Bruce A., '53, and Peggy Sale Kresge, '53, Science Fellowship, Taylor Undergraduate Research Fund (Geology Department), Langbo Trustees' Professorship, University of Michigan Museum of Paleontology

ERIKA NICHOLS, '10

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

CHRISTOPHER OMERZA, '12

Formylation of Substituted Phenols Using Microwave Irradiation

Faculty Sponsor: Vanessa McCaffrey

Major: Chemistry
Hometown: Empire, Mich.

Aromatic aldehydes are extremely versatile reagents in organic chemistry. Of particular interest are substituted dialdehydes because of their usefulness in the synthesis of substituted Schiff-base macrocycles. These macrocycles are



finding uses in such diverse areas as molecular magnetism, organic catalysis, and water splitting. Duff formylation of substituted phenols was performed to synthesize a series of n-substituted 2,6-diformylphenols. The substituents range from the electron donating methoxy group to the strongly withdrawing nitro group. Halogens and other moderate donors were also explored. Ortho-, meta-, and para-substituted phenols were used in the Duff formylation to determine the effect of substituent location on reactivity. All

reactions were performed under microwave irradiation which greatly reduced reaction time. In addition, microwave irradiation reduced degradation of products and eliminated the need to perform the reaction under inert gas. Reactant ratios, reaction times, and temperatures were varied to maximize yield and purity of the desired product. Effects of solvent on the reaction will also be discussed.

Supported by: FURSCA, American Chemical Society Petroleum Research Fund

ALEX PARKER, '11

Techniques and Analysis in Immunocytochemistry and Histology

Faculty Sponsor: Tammy Jechura

Major: Psychology
Hometown: Ann Arbor, Mich.

The debate of nature versus nurture has proven to be more complex than determining which one or the other influences behavior, or which one accounts for what percentage of an organism's actions. Immediate early genes (IEGs)



are genes that are expressed in response to environmental cues, and research on these genetic factors suggests that behavior can be the result of interactions between nature (genes) and nurture (the environment). The current research examines the expression of *c-fos*, an IEG, in the brains of *Octodon degus*, a social, diurnal rodent, that have been exposed to stimuli that have been shown to produce specific behavioral responses in this species. The goal of this project is to determine which brain areas are responsive to discrete olfactory cues that degus can use to re-entrain their circadian rhythms (get over jet-lag-like symptoms) after changes in their light-dark schedules.

ASHLEY PETERSON, '10

Communicating in the Information Age: Examining Communication Apprehension and Changes in Media Use and Appropriateness

Faculty Sponsor: Jeremy Osborn

Majors: Communication Studies, International Studies
Hometown: Marquette, Mich.

Growing up in the age of information overload, teens and members of Generation Y (those ages 18-32) cannot avoid the impact of the Internet. The influx of new types of computer-mediated communication (CMC) includ-



ing instant messaging, text messaging, and e-mail has caused changes in the way these individuals communicate. The Internet and other forms of CMC have grown to become a social hub for these generations. As a result, how these individuals choose to use media to communicate has also shifted. Today, instead of visiting a clothing store or a bank, one can perform these tasks online.

Compared to face-to-face communication, CMC does not require the same amount of participation from the individual. Previous studies have shown that shifts regarding CMC have had positive and negative impacts on communication-apprehensive individuals. How individuals choose to use CMC and what individuals deem appropriate to communicate within these media has also shifted. In order to better understand the impact of CMC, this study examined communication apprehension and changes in appropriateness and likelihood of use. A survey of 142 students was conducted using

various interpersonal situations. It is clear that those surveyed still believe that face-to-face communication is most appropriate and was rated the most likely used form of communication for all tested interpersonal situations. It was also discovered that there are differences between CMC types of media use and appropriateness. These results are an indicator of the shifts CMC has contributed and will likely continue to contribute to the lives of these individuals.

COURTNEY PICKWORTH, '13

Conscientiousness Facets Predict Driving Risk-Taking, but Not Investment Risk-Taking

Faculty Sponsor: Andrew Christopher

Major: Psychology
Hometown: Columbus, Ohio

Previous research has established an inverse relationship between conscientiousness and risk-taking behavior, with a focus on health risks. The current research examined six facets of conscientiousness (competence, order, dutifulness, achievement striving, self-discipline, and deliberation) to predict investment and driving risk behaviors, controlling for sensation seeking and socially desirable responding.



Eighty college students completed measures of conscientiousness, sensation seeking, socially desirable responding, investment risk, and driving risk. Conscientiousness facets were generally related to sensation seeking ($Mr = -.37$) and socially desirable responding ($Mr = .21$). Sensation seeking was related to both investment ($r = .26$) and driving risk-taking ($r = .28$). Of the conscientious-

ness facets, only deliberation was related to investment risk-taking ($r = -.21$). Regarding driving risk-taking, four of the conscientiousness facets (i.e., order, dutifulness, self-discipline, and achievement striving) were significantly related to these behaviors ($rs > -.24$); the other two conscientiousness facets were marginally related to these behaviors ($rs = -.17$ and $-.19$, respectively). Two hierarchical regressions were used to determine which facets of conscientiousness were most predictive of investment risk and driving risk. No facets of conscientiousness predicted investment risk-taking. Regarding driving risk, the regression revealed that order ($B = -.197$, $SE = .071$, $\beta = -.364$, $p = .007$) and self-discipline ($B = -.187$, $SE = .092$, $\beta = -.347$, $p = .046$) were both negatively predictive of driving risks, whereas achievement striving ($B = .165$, $SE = .087$, $\beta = .309$, $p = .063$) was positively predictive of driving risks. The results suggest that conscientiousness is predictive of only some forms of risk-taking.

Supported by: Student Research Partners Program

LAUREN PONTA, '10

To Oxford and Grenoble and Back: *Réflexions sur une année à l'étranger*

Faculty Sponsor: Dianne Guenin-Lelle

Majors: French, English
Hometown: Grosse Ile, Mich.

This presentation in English and French is the continued exploration and reflection upon a year shared between Oxford, England and Grenoble, France in 2008-09. Examination of these cities as academic environments and as veritable sister cities serves as a framework through which I present my memoir of cultural observations experienced during the year abroad.



KAYLEE POPE, '10

Albion College and Sustainability

Faculty Sponsor: Molly Mullin

Majors: Anthropology, English
Hometown: Grand Rapids, Mich.

Whether it be infiltrating the media or curriculum here on campus, sustainability is a little word that gets lots of attention. But what exactly does this word mean and where did it come from? I interviewed several key students, staff, and faculty members as to what their personal definition of sustainability was, where those ideas may have come from, and whether or not they felt that sustainability was a buzzword. In doing both academic research and interviews, I came to understand that sustainability is a multi-faceted concept. It is a word that having gained considerable clout has become impossibly complicated. Disagreement and distrust of its popularity abound. What this study sought to find out was how sustainability worked on campus. Engaging my interviewees in one-on-one as well as group discussions about their work and their opinions, I gathered a wealth of information not only about Albion College's sustainable world, but also created a snapshot of a particular moment in time. In this presentation, I will compress my findings and attempt to explain where the word sustainability came from and how it made its way onto campus, working to define what sustainability is on Albion's campus.

KAITLYN POSPIECH, '13

(See Erica Tauzer, '10, Kaitlyn Pospiech, '13)

KAYLEIGH PUNG, '11

(See Erin Goldman, '11, Kayleigh Pung, '11)

REBECCA PUTANS, '10**Fabrication and Characterization of Supported Metallic Nanoscale Catalysts: Toward *ex situ* Remediation Technology**

Faculty Sponsor: Kevin Metz

Major: Chemistry
Hometown: Kentwood, Mich.

New technology that uses nanoparticle-loaded filtration membranes has emerged as a route to water remediation. There are currently multi-stepped fabrication methods to deposit metal nanoparticles onto membrane supports.

We have devised a new method to deposit palladium nanoparticles onto porous filtration membranes in one step. This one-step method has the potential to increase surface coverage of the membrane and inside the pores.

Supported by: FURSCA, American Chemical Society Petroleum Research Fund



ELIZABETH REIMANN, '10**Maria Sibylla Merian**

Faculty Sponsor: Bille Wickre

Major: Art History
Hometown: Albion, Mich.

Maria Sibylla Merian's *Metamorphosis Insectorum Surinamensium*

represents a union of scientific and artistic study, analysis, and creativity. Merian's accomplishment is remarkable for a number of reasons.

Merian was one of a very few women working in either scientific research or botanical illustration. She traveled to Suriname to pursue her research and used art to generate a body of knowledge in relation to plants, animals, and natural processes that had not been previously studied. She was successful in finding patrons and sponsors to finance the *Metamorphosis Insectorum Surinamensium* through more than five editions in four languages. Merian's success and struggles in both art and science cast light on conditions for seventeenth-century women of intelligence, talent, and ambition. Her work was accomplished with great diligence, spirit, and grace. This study discusses Merian's rights as a woman living in the seventeenth and eighteenth centuries, how her financial status propelled her learning and achievement in the world of natural history, modern entomology and zoology, as well as the illness she contracted during her travel to Suriname.

Supported by: FURSCA



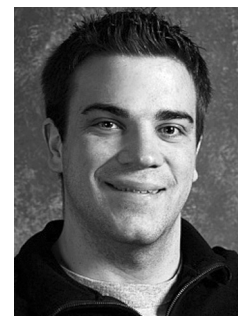
JACOB RINKINEN, '11**Homogenous Faith, Ethnic Diversity: Desirable and Undesirable Traits in a Marital Partner in Nigeria**

Faculty Sponsor: 'Dimeji Togunde

Majors: Chemistry, Anthropology and Sociology
Hometown: Highland, Mich.

This study draws on survey data gathered in 2007 from over 2,000 students in six Nigerian universities to investigate desirable and undesirable traits in a future marital partner and how these traits vary by gender.

Until now, there is no single study in the African context that examines how measures of Westernization and globalization impact qualities desired in a mate. Findings indicate that a vast majority of respondents prefer to select their future marital partner on their own rather than through an arranged marriage. Yet an overwhelming proportion of students are unwilling to marry someone without the consent of their parents. Respondents would prefer not to marry a partner who: does not possess a comparable university education, does not want to have children, lacks domestic skills, is not good at cooking, does not believe in God, and practices a different religion. However, respondents are more willing to marry a spouse who: comes from a different tribal/ethnic group or nationality, and has had previous sexual relations. Significant gender differences were found to exist in traits such as domestic skills, age difference between spouses, level of education, parental socioeconomic status, and desire to have children. The conclusion is that a simultaneous operation of traditional and contemporary mating dynamics is taking place in Nigeria. The urban-based respondents seem to hold on to some aspects of African traditional culture and practices regarding desirable and undesirable traits in a marital partner. At the same



time, the criteria for mate selection are being impacted by forces of Westernization and globalization, such as the Internet and foreign mass media.

Supported by: FURSCA-Orpha Leiter Irwin Research Fellowship

ALLISON ROBBINS, '10

Riparian Change in an Expanding Urban Environment: A Study of Historic Habitat Change along the Truckee River

Faculty Sponsor: Christopher Van de Ven

Major: Biology
Hometown: Chardon, Ohio

Riparian habitat provides important resources for many plants and animals. In semiarid climates, riparian zones provide a concentration of food and water resources and vital habitat which attract unique native populations of avian species. The city of Reno, Nevada lies in such a semiarid climate. It has grown greatly in the last few decades, dramatically affecting the Truckee River and the native riparian habitat along its floodplain. Since its initial settlement in the nineteenth century, Reno and other communities have altered the amount and distribution of riparian habitat as well as altering the flow of the Truckee by means of diversions. Large remnant patches of native habitat encourage native bird species and are better able to support diverse avian populations than patches dominated by nonnative vegetation. Photos from 1940, 1965, and 2006 showed the habitat changes. Evaluating the historical aerial photographs with GIS, I identified riparian zones. Landscape metrics including the area, perimeter, and proximity of habitat patches were measured, and the perimeter-area ratio was calculated. Over the three time periods from 1940 to 2006, there is an increase in the number of patches and total riparian area over the entire length of the Truckee River. The mean patch area underwent a significant decrease from 1940 to 1965 with a slight recovery in 2006. Nearest neighbor distance and perimeter-to-area ratio decreased from 1940 to 2006.



This indicates an increase in available habitat for avian species. Human awareness of the importance of native habitat, the development of parks, and human planting of trees in the urban landscape seem to have increased the area and number of riparian habitat patches.

Supported by: National Science Foundation Research Experiences for Undergraduates, University of Nevada, Reno; Great Basin Institute

MEGAN ROBERTS, '10

Time-Dependent Spatial Learning in the *Octodon degus*

Faculty Sponsor: Tammy Jechura

Majors: Psychology, Biology
Hometown: Roseville, Mich.

Octodon degus are diurnal rodents, native to South America. They live in burrowing communities with few males in a predominantly female social system. This research examines the ability of degus to demonstrate time-space learning. This type of learning requires an animal to use an internal sense of time paired with spatial navigational memory ability. In this experiment, degus were trained to find food rewards with two different patterns of locations at two different times of day, morning or afternoon, in a six-arm radial maze. There were three phases of training. First, animals learned to find a food reward at one time of day. Then they learned to find a food reward in different arms of the maze at the opposite time of day. Finally, degus went on to the more complex task, the time-dependent task. It was predicted that degus would learn the time-space task and that there would be sex differences in their performance. In addition, castration would reveal hormonal effects. Overall, intact degus were able to learn the time-place task, as predicted, with no significant sex differences in performance. When comparing intact degus to gonadectomized animals, the intact animals learned the time-space task significantly faster than the gonadectomized animals. In addition, ovariectomized females, but not castrated males, were able to complete the basic task of finding a food reward at one particular time of



day, suggesting that testosterone is necessary for males to perform this task, whereas ovarian hormones are not essential for completion of the non-time-dependent task.

Supported by: FURSCA, Neuroscience Concentration

JACKIE ROLLIN, '10

The Effects of Incentive Framing and Motivational Orientation on Proofreading

Faculty Sponsor: Mareike Wieth

Majors: Psychology, English
Hometown: Waterford, Mich.

Would you be more motivated by the prospect of winning five dollars or avoiding a five-dollar fine? This study was designed to investigate the effects of motivational orientation (i.e., a preference for approaching positive outcomes or avoiding negative outcomes) and incentive framing (i.e., phrasing) on the ability to detect errors in proofreading tasks. Participants were randomly assigned either a gain-framed or loss-framed incentive and asked to complete a set of proofreading tasks. The gain-framed incentive was phrased in terms of how many five-dollar gift cards one could gain while the loss-framed incentive was phrased in terms of how many gift cards one could lose. The number of correctly and incorrectly identified errors was recorded. To assess motivational orientation, participants completed the 20-item Behavioral Inhibition System/Behavioral Activation System Scale.



Results indicated that participants whose incentive frame matched their motivational orientation identified fewer errors than participants whose incentive did not match their motivational orientation. In addition, results indicated that those individuals whose incentive frame matched their motivational orientation were more likely to incorrectly identify errors than those whose incentive frame did not match their motivational orientation. These results suggest that when incentive frame matches motivational orientation, participants are more likely to take risks. These risks result in a greater number of incorrectly identified errors and a fewer number of

correctly identified errors. When incentive frame mismatches motivational orientation, participants appear more conservative, resulting in a fewer number of incorrectly identified errors and a greater number of correctly identified errors.

Supported by: FURSCA-Vernon Lawson Research Endowment

KATHERINE ROSS, '10

A Tale of Two Enclaves: The Development and Disappearance of Two Spanish Enclaves in West Virginia during the Twentieth Century

Faculty Sponsor: Molly Mullin

Majors: Anthropology, Spanish
Hometown: Grosse Pointe Park, Mich.

This study considers two Spanish-American enclaves that were formed in the beginning of the twentieth century in the two small towns of Anmoore and Spelter in West Virginia. These towns were once thriving Spanish



communities, yet today there is barely any trace of the Spanish people who used to be the ethnic majority. The two main questions addressed in this research were, "Why did the Spanish settle here and what happened to these enclaves?" To answer these questions I used anthropological methods of interviewing various sources including those from the communities as well as my Spanish relatives from the province of Asturias in Spain. I also looked at memoirs and other authentic documents and pictures left behind by the inhabitants of these enclaves, and I reviewed and referenced scholarly material on the subject. I found that many, if not most, Spaniards came to these towns for work in zinc smelting. The closure of the zinc smelting operations in these towns, along with other economic and educational opportunities elsewhere, caused the disintegration of the towns. My study tells the story of a complex immigration history of a group of people whose story was not written down before. For many, the immigration story of their ancestors is similar; it is the

story of cultural assimilation through these ethnic communities while still maintaining a sense of ethnic heritage.

ELIZABETH SCHULHOFF, '10

The Strange Case of Adaptations

Faculty Sponsor: Ian MacInnes

Majors: English, Theatre
Hometown: Novi, Mich.

Robert Louis Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* examines the age-old conflict of good versus evil. Through the text, Stevenson demonstrates a belief that man is a product of both savagery and civilization, a belief that was influenced by his religious upbringing, the Victorian society he lived in, and his time in the South Seas islands. The resulting work is a complicated text which challenges readers to question their own notions of what makes us human.



The story is popular and has been retold many times since its publication. But how do adaptations for children work when the core of the story is so complex? How can *Wishbone* or *VeggieTales* even attempt to re-imagine Stevenson's work without either oversimplifying the text or creating something too mature for young readers?

This thesis proposes that the adaptability of the text can be ascribed to the three roles Stevenson plays: psychologist, Gothic writer, and architect of childhood. Through a close examination of how Stevenson plays these roles, I seek to answer the question of how Stevenson creates a text that is multidimensional in a way that appeals to both children and adults. I have chosen six adaptations to serve as a representative sample of retellings for children: a book from the *Zach Files* series, a *Batman* comic book, a "Tom and Jerry" cartoon, a book from the *Goosebumps* series, a book from the *Wishbone* series, and a cartoon from *VeggieTales*.

DANNY SEIKEL, '12

(See Albion/ESCIA Student Entrepreneurial Exchange)

NICOLE SIMONE, '09

Theory or Practice: Discerning a Better Way to "Teach" Leadership

Faculty Sponsor: Vicki Baker

Major: Economics and Management
Hometown: Romeo, Mich.

This study involves a three-piece comparative analysis of two different styles of leadership education: the theoretical approach and the more practical approach. Popular movies were shown to undergraduate management students after being exposed to both popular leadership theories and *The 50 Do's for Everyday Leadership*, a self-help leadership book containing a list of 50 successful leadership behaviors. Students were asked to comment on leadership behaviors in the movies and were tested on the ability to recall information presented in the "50 Do's" and/or the leadership theories (without being specifically instructed to recall information from either of these sources). Part 1 of the student study was done one week after the presentations of the "50 Do's" and the leadership theories, and part 2 took place approximately four weeks after these presentations, in order to test the students' recall ability across a period of time. Surveys were also sent out to business professionals to gather information about their own beliefs regarding successful leadership behavior. Their responses were analyzed for connections to the "50 Do's" and/or the popular theories of leadership. These professionals were not educated on the styles of leadership education used in this research in order to ensure that they provided unbiased and useful information. According to the students' recall ability, the results of this study determine that the more effective way to 'teach' leadership behaviors identified as successful by the surveyed business executives is by using a more practical approach (such as the "50 Do's").

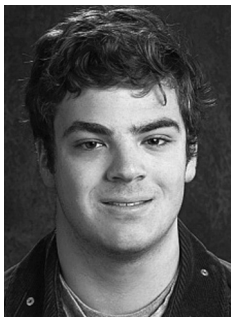
TIMOTHY STEVENS, '10

Fluorescence Analysis for Group I Introns Using an ABI Prism 310 Genetic Sequencer

Faculty Sponsor: Christopher Rohlman

Majors: Biochemistry, Biology
Hometown: Grosse Pointe, Mich.

Introns are linear sequences of ribonucleic acid (RNA) that are spliced out after their biosynthesis, or transcription, from a DNA template. RNA splicing is one of many RNA processing reactions that must take place before the RNA



can be used in our cells. Group I introns are members of a family of catalytic RNA that are capable of performing a range of reactions including self-splicing and the cleaving of RNA in two. This self-splicing reaction takes place in the cell without the aid of protein-based enzymes, which serve as catalysts in the majority of metabolic reactions. A modified version of the introns was used in order to follow the first cutting reaction involved in splicing. Therefore the RNA molecule serves as a catalyst and is called a ribozyme.

My research focused on the development of techniques which utilize capillary electrophoresis and fluorescence spectroscopy to understand ribozyme chemistry. Group I ribozyme cleavage chemistry was followed using an ABI 310 genetic sequencer. The sequencer depends on capillary electrophoresis to separate DNA or RNA molecules based on size. This process allows the bound ribozyme, unbound ribozyme, and the substrate to separate due to their differing lengths. Fluorescent molecular tags were used to label and track the RNA molecules through the experiment and during their trip through the sequencer. A laser in the sequencer emits a light of appropriate wavelength to donate a photon to the fluorescently labeled RNA. The excited fluorescent tag then emits light that the sequencer uses to detect, track, and measure the amount of RNA present in its different forms during the chemical reaction. As the reaction progresses, kinetic data can be recorded under varying reaction conditions. This information allows us to better understand the binding and

catalytic behavior of Group I introns. The models for RNA catalysis under development are applicable to all living organisms, and contribute to our understanding of the biochemistry that makes life possible.

Supported by: FURSCA-Orpha Leiter Irwin Research Fellowship

MARK STEVENSON, '12

(See Albion/ESCIA Student Entrepreneurial Exchange)

MARK STEVENSON, '12

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

RYAN STOWE, '10

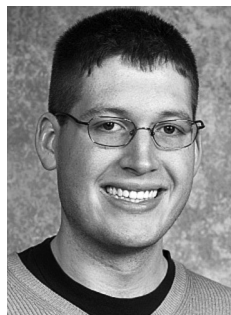
Structure-Activity Relationships for a Small Molecule AIF-DNA Inhibitor

Faculty Sponsor: Andrew French

Major: Chemistry
Hometown: Jackson, Mich.

Apoptosis inducing factor (AIF), a flavoprotein which plays a vital role in caspase-independent cell death, presents a promising target for small molecule inhibition. The Hergenrother lab, using photonic crystal biosensors, identified the first small molecule inhibitor of AIF in 2008. Now, using the same method, a more clinically relevant inhibitor has been discovered which warrants further SAR studies. This presentation shall show the initial results of this study.

Supported by: National Institutes of Health, Michael J. Fox Foundation, Snyder Summer Fellowship



SABRINA SUTHERLAND, '10

"Living in the Body": Poems

Faculty Sponsor: Helena Mesa

Major: English
Hometown: Battle Creek, Mich.

We live our lives within, or as part of, physical bodies. We are subject to their limitations and their transcendence; they are an extension of our identity and also separate entities entirely. Our hands move up into the air when we reach



to pick an apple, but we don't command our bodies to digest. They do so independent of our opinion. "Living in the Body" is a collection of poems exploring what it means to dwell within a physical body as a consciousness both separate from and intrinsically part of it. Through the exploration of the many physical moments of life, such as birth, sex, disease, and death, these poems help us arrive at a greater understanding of how the body informs our identities and our reaction to the world around us.

ELIZABETH SYLAK, '10

An Examination of Jesuit (Iconographic) Rings from the Fort St. Joseph Site in Niles, Michigan

Faculty Sponsor: Bradley Chase

Majors: Anthropology, Psychology
Hometown: Bluffton, Ohio

First circulated by Jesuit missionaries on their visits to New France in the seventeenth and eighteenth centuries, copper-alloy finger rings bearing Jesuit and secular iconography are found wherever French traders or colonists



ventured. Fort St. Joseph was a Jesuit mission and later both a trading post and a military garrison near the modern city of Niles, Michigan. The fort allowed the French to gain better control of southern Michigan,

easier access to the Mississippi River, and greater control of important trade routes. The Jesuit rings found at Fort St. Joseph constitute a unique and large assemblage that adds to a growing body of knowledge on Jesuit rings and allows for further speculation as to their exact function. Because the rings are religiously, economically, and politically charged objects they can be used to better understand the places and people from which they were recovered. This study presents a review of previous literature on Jesuit rings, specifically their manufacture, use, and distribution. In addition, it provides an analysis of the rings from Fort St. Joseph and a comparison of Fort St. Joseph's assemblage to other sites where the rings have been found.

ERICA TAUZER, '10

A Case Study of Urban Ecological Analysis: The Phytogeography of Vacant Lots in Southwestern Baltimore, Maryland

Faculty Sponsor: Sheila Lyons-Sobaski

Majors: Biology, Spanish
Hometown: Gladstone, Mich.

Prior analysis of vegetative species richness has suggested that urban vacant lots act as "islands in space and time amidst a sea of impervious surfaces," fitting within the framework of the equilibrium theory of island biogeography. The relative abundances of forbs and trees within 31 vacant lots were sampled in a nine-block-square area in the neighborhood of Harlem Park in southwestern Baltimore, Maryland. Regression analysis indicated no significant correlation of species richness and species diversity on isolation and a significant negative correlation with area, suggesting that the theory of island biogeography does not adequately explain the species variation within this set of vacant lots. Canonical correspondence analysis was used to show clustering of individual species within the lots as driven by known variables which included area, isolation, lot shape, species diversity, and species richness. From this analysis, several clusters appeared, indicating that overall species richness and diversity may depend on



a variety of factors which includes but is not limited to lot area, lot isolation, lot shape, and relative species richness and diversity.

Supported by: National Science Foundation Research Experiences for Undergraduates, Cary Institute of Ecosystem Studies

ERICA TAUZER, '10

Majors: Biology, Spanish
Hometown: Gladstone, Mich.

KAITLYN POSPIECH, '13

Major: Geology
Hometown: Grand Rapids, Mich.

Albion College's Contribution to Climate Change: Calculating Campus Greenhouse Gas Emissions from 1990 to 2008

Faculty Sponsor: Timothy Lincoln

In summer 2007 the American College and University Presidents' Climate Commitment was signed by Albion College. As part of that commitment, Albion College is committed to developing and implementing a plan for climate neutrality and completing an inventory of all greenhouse gas emissions which is to be updated every other year thereafter. Over the last two years, we have collected over 18 years' worth of data ranging from annual demographic and budgetary information, various forms of energy consumption on campus, student and faculty transportation, fertilizer use, and even the number of horses housed at the Held Equestrian Center. This resulted in the calculation of annual measurements of CO₂ and other greenhouse gases (which include N₂O, CH₄, HCFCs, O₃, PFCs, HFCs, and SF₆) for all of the campus, along with calculations for specific sectors of total campus greenhouse gas production (eCO₂). Trends surrounding this greenhouse gas production were then extrapolated back to 1990 using all available records from years prior to 2007. In 2007, net emissions calculated to be 24,465 metric tons (MT) eCO₂ and 12.46 MT eCO₂/student. This was an increase of 5,202 MT eCO₂ net emissions and 0.84 MT eCO₂/student from 1990. Building efficiency has remained unchanged, with 16.5 kg eCO₂/



Pospiech

total building space for both 1990 and 2007. Results from this work have been published online at the Web site of the Association for the Advancement of Sustainability in Higher Education (AASHE) and will provide a way to measure future decisions made on campus in Albion's effort to become climate neutral.

Supported by: National Wildlife Federation Campus Ecology Fellowship, Institute for the Study of the Environment

SEAN THORNTON, '11

Chaos Theories: Tapping into the Modern Music Industry

Faculty Sponsor: Anne McCauley

Major: Economics and Management
Hometown: Buchanan, Mich.

Music. The art of sound. An auditory expression of emotion. The modern music industry is alive and evolving. It is no longer necessary for musicians to belong to a record label in order to have people across the planet



listen to their creations. One click of the mouse separates an artist in Michigan with a listener in Madrid. With this concept in mind, I have launched a musical persona. Piece by piece I am constructing the fabric of an Internet-based musical artist, from the writing and composition of the music, to the viral marketing, to the accompanying video images, to the Internet tracking of frequency. The goal of this project is essentially quite simple, to be heard by as many people across the world as possible, who wouldn't have the opportunity to listen to these creations without the Internet. The album, entitled "Chaos Theories," is a collection of songs focused on many different uncertainties in the world, but wrapped in hopeful and uplifting themes. The music industry is under transformation, and the ability for an independent artist to be heard is growing significantly.

SANDRA TURAY, '10

Long Live the Cedars of Lebanon: The Stories of Five Generations of a Lebanese Family in Three Nations

Faculty Sponsor: Laura Williams

Major: Ethnic Studies
Hometown: Ishpeming, Mich.

For many years, the Arab American population of Michigan has been an invisible population. Having never been acknowledged as a significant part of the population, numerically or culturally, the ways and extent to which Arab Americans have assimilated is still debated by many researchers today. In an effort to add to the Arab American literature, this paper addresses the key moments in the lives of Lebanese individuals as they navigate their identity through time and space.

The stories of the Joseph family span three countries as well as five generations in an effort to encapsulate how being Lebanese plays out in different ways. Tracing the Joseph family from Lebanon to the United States and Scotland, this paper aims to recreate their life stories as they navigate what it means to be Lebanese in their respective communities and generations. Through a narrative voice that captures the essence of Lebanese identity, readers are able to explore and understand on a personal level the pressures that transform the way in which ethnic identity is displayed. This paper tells the story of how one family, the Joseph family, has adapted and maintained their Lebanese identity while trying to find the balance between what was and what is in regard to time and space.



KATHRYN WAGNER, '10

Trigonometric Functions in the Biangular Plane

Faculty Sponsor: Mark Bollman

Majors: Mathematics, Economics and
Management
Hometown: Fort Wayne, Ind.

A coordinate system is a set of rules or methods used to indicate a specific location in space. While commonly used in academic fields, coordinate systems are also a foundation for many daily activities and technologies. Of the many different types of coordinate systems, two of the most familiar are the Cartesian or rectangular coordinate system, which employs two distances to denote a point, and the polar coordinate system, which employs one angle and one distance to depict a point. Related to these two systems is the biangular coordinate system, which employs two angles, ϕ and θ , to describe the location of a point.

In this study, families of functions that are well-known within the Cartesian and polar systems are reconsidered by converting and plotting them in the biangular coordinate system. With *Mathematica* used as a plotting device, many of these graphs can be examined in a reasonable amount of time. The limitations and successes of the biangular coordinate system can then be observed, and the relationships best represented by two angles can be determined. Many new shapes and graphical characteristics result from the conversion into this new coordinate system. Functions common in the rectangular plane have diverse counterparts when translated into a biangular relation. The system has many possible applications, but the development of these uses is left for another study.

*Supported by: FURSCA-Bruce A., '53, and
Peggy Sale Kresge, '53, Science Fellowship*



QIAN WANG, '10

Cavity Ring-down Spectroscopy

Faculty Sponsor: Craig Bieler

Major: Chemistry
Hometown: Jinan, China

Cavity ring-down spectroscopy (CRDS) is a technique based on the measurement of the time rate of decay of a pulse of light trapped in a high reflectance optical cavity. Because of its high sensitivity, this technique can be used to detect molecules at extremely low concentration, which has allowed it to be used in a variety of applications such as atmospheric monitoring and the study of chemical reaction dynamics. For this reason, we have designed and constructed a CRDS system in order to take advantage of the benefits of this technique.

Our CRD spectrometer consists of a vacuum tight optical cavity, two highly reflective mirrors, a nitrogen laser (337 nm), a photodiode detector, and an oscilloscope. Data collection is computer-controlled using a program written using the LabView® software package. Examples will be shown of a typical spectrometer signal, the decay of that signal, and data analysis for a test system, methyl vinyl ketone.

Supported by: FURSCA

TIM WASMER, '10

(See Google Online Marketing Challenge:
Optimizing Internet Marketing through
Google Adwords)



KRISTINA WEAGE, '10**Synthesis and Characterization of Palladium Nanoparticles on Functionalized Glassy Carbon**

Faculty Sponsor: Kevin Metz

Major: Biochemistry
Hometown: Baroda, Mich.

Metal nanoparticles (MNPs) can be grown directly on substrates for use as supported catalysts, but this approach typically does not allow for significant control over physical properties (size and shape) of the nanoparticles.



Another approach, using solution techniques, is able to produce MNPs with high control of physical properties. However, the processes to deposit the nanoparticles onto surfaces are difficult and time-consuming. A new process has been developed for fabricating palladium nanoparticles directly onto chemically modified carbon surfaces. This process removes the problem of post-synthesis attachment and allows for control of the size of the palladium nanoparticles.

Supported by: FURSCA-Robson Family Fellowship, American Chemical Society Petroleum Research Fund

SARAH WENNER, '10**Mimetic Alethia: Using Dance as a Catalyst for Archaeological Comprehension of Culture**

Faculty Sponsor: Heather Vaughan-Southard

Majors: Economics and Management,
Anthropology
Hometown: Rochester, Mich.

This thesis argues that an archaeological comprehension of cultural norms and underlying beliefs cannot be obtained without the understanding of the society's dance. Archaeology has largely ignored dance and even dramatic practices, with the exception of Greek and Roman theatrical structures, as artifacts because of their ephemeral quality. However, closer examination of structured movement is possible by addressing body position in art, common tools used in daily life, cosmological conception, and the relationship between performer and audience. By examining how dance has been used as a means of expression in several societies since the Upper Paleolithic era, it becomes apparent that dance was a central activity and means of self-preservation for multiple societies. In addition, this study draws on arguments from post-processualists and Pierre Bourdieu to explore the importance of practiced movement.



With this understanding of dance, it is possible to recreate, not reconstruct, the dances used in a culture by seeking inspiration where it was originally found. The Nabataeans, as a case study, illustrate the shared commonalities between their culture and their Roman conquerors. In the dance piece I choreographed, I modernized Nabataean gestures so they would have a greater chance of being understood by contemporary audiences. While the gestures are modified, the meaning is the same. The piece evolves from traditional Bedouin movement to dance used in contemporary culture, interspersed with acrobatics and line dance from Egyptian and Greek art, as a reflection of their influence on Nabataean culture. This paper further examines how presentation of

dance can communicate cultural ideals which might not be understood in their original artistic context.

Supported by: FURSCA-James W. Hyde Endowed Student Research Fellowship

CHRISTOPHER WHITE, '12**Personality and Nest Defense in House Wrens (*Troglodytes aedon*) in the Whitehouse Nature Center**

Faculty Sponsor: Douglas White

Major: Biology
Hometown: Midland, Mich.

Behavioral personalities in birds may involve tradeoffs between reproductive success and survival. This study examined varying shyness and boldness in 30 female house wrens in the Whitehouse Nature Center, with the hypothesis that bolder females would risk their own well-being to defend the nest, while shy females would flee to protect themselves. Boldness in nest defense was also expected to increase during incubation as female investment in the clutch increased. Three indicators of personality were used: fleeing the box during morning census, number of hops and scolds exhibited while I stood by the nest for two minutes, and gaps during nocturnal incubation. As expected, as nesting progressed wrens became bolder, exhibiting a decline in willingness to depart the nest during census, more hops and scolds during personality assays, and fewer gaps in nocturnal incubation. Most females during nesting days 4-6 left the box when approached and exhibited few to no scolds or hops. During nesting days 8-10, however, females exhibited on average 1.4 times more hops and scolds. Bolder females also exhibited consistently fewer nocturnal gaps, and more scolds and hops, compared to shier females. The value of bold and shy personalities may vary with predator risk and weather. Boldness may increase during the nesting period as investment in the clutch increases and opportunities for later clutches decrease.



Supported by: FURSCA-Julia Robinson Burd, '31, Memorial Fellowship

ANNA WILLIAMS, '10

“Emma’s Quest: A Children’s Novel”

Faculty Sponsor: Kyle Shanton

Major: English
Hometown: Wixom, Mich.

Although the field of children’s literature has vastly expanded in recent years, there remains a stark underrepresentation of literature about Middle Eastern cultures and ethnicities, especially with respect to Armenian heritage. Being part-Armenian myself, the lack of literature available regarding the culture is personally significant. Although not actively involved in the Armenian community, I consider my own Armenian heritage an important part of my cultural identity, and wrote “Emma’s Quest: A Children’s Novel” partly as a response to this underrepresentation. The novel tells the story of a young American girl who forges a relationship with her Armenian grandfather and learns about her cultural heritage when her grandfather leaves Armenia and joins her family to grieve the death of her grandmother. Through listening to her grandfather’s personal stories reflecting Armenian traditions and history, ten-year-old Emma comes to a deeper understanding about herself, her family, and her culture. A novel about identity, cultural understanding, and relationships, “Emma’s Quest” reflects my desire to engage with my own Armenian identity. As a future elementary school teacher, I found the writing of this novel also presented an opportunity for me to provide further access to cultural pluralism for elementary age children.



In this presentation I plan to first explain my motives for writing the novel. I will then read four excerpts from various parts of the novel, and follow up by explaining why each was chosen and discuss its significance. I will conclude by discussing how writing this book has influenced me as both an individual of Armenian descent and a future elementary school teacher.

Supported by: FURSCA

MALLORY WOODROW, '10

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

THOMAS WORDEN, '13

(See Google Online Marketing Challenge: Optimizing Internet Marketing through Google Adwords)

MATTHEW ZABOROWICZ, '11

Optimization of the Fluorescent Labeling of Substrates for the *Tetrahymena* and *Twort* Group I Ribozymes

Faculty Sponsor: Christopher Rohlman

Major: Biochemistry
Hometown: Sterling Heights, Mich.

Over the past three decades there has been increasing interest in the area of ribonucleic acid (RNA) biochemistry, due to the discovery of the multitude of roles RNA plays in the cell. These discoveries include the ability of catalytic RNAs (known as ribozymes) to catalyze metabolic reactions and the ability of “non-coding” RNAs (ncRNA) to regulate cellular metabolism and gene expression. Prior to these findings RNA was thought to serve merely as a stepping-stone in the classic expression of genetic material from DNA to RNA to protein. However, this more recent research has uncovered that RNA does much more than just code for proteins. At the heart of these insights is the structure-function hypothesis. RNA is typically found in the cell as a single stranded polymer chain, in contrast to double stranded DNA. This allows RNA molecules to fold into complex three-



dimensional structures by forming base pairs within a single polymer chain. In the cell, RNA will often undergo a splicing process where the “introns” are cleaved at their borders and the neighboring “exons” are spliced together. RNA splicing is one of many RNA processing reactions that must take place before the RNA can be used in our cells.

Group I introns are members of a family of catalytic RNA that are capable of performing a range of reactions including self-splicing and the cleaving of RNA in two. Group I introns possess the ability to self-splice through folding and phosphotransesterification reaction. We study Group I introns in the ribozyme form, which is a modified version of the original intron with an “active site” that allows the ribozyme to catalyze the cleavage of another RNA molecule into two. The target of this ribozyme is a “substrate” RNA that is designed with fluorescent tags to quantitatively study the cleavage reaction. The substrate itself is designed around the principles of fluorescence resonance energy transfer. This substrate is synthesized using a classic ester leaving group reaction; however, current protocols prove to be inefficient. We have undertaken a study to find chemical reaction conditions that might achieve the ideal, one-to-one stoichiometry between the fluorescent label and RNA molecule and therefore eliminate excess waste products. The goal of this research is the optimization of the fluorescent labeling reaction of RNA molecules used in our studies of Group I ribozymes.

Supported by: FURSCA-Orpha Leiter Irwin Research Fellowship



Albion/ESCIA Student Entrepreneurial Exchange: (left to right) Sam Jabara, Quentin Cigolari, Dan Seikel, Xavier Jeger (partially covered), Odile Genet, Carole Focard, Angela Bennett, Sophie Song Vilay, Lindsey Keyes, Mark Stevenson

ALBION/ESCIA STUDENT ENTREPRENEURIAL EXCHANGE (SEE): An International Partnership

ANGELA BENNETT, '12

Major: Economics and Management
Hometown: Lake Orion, Mich.

SAM JABARA, '12

Major: Economics and Management
Hometown: Boyne City, Mich.

LINDSEY KEYES, '12

Major: Economics and Management
Hometown: Chelsea, Mich.

DANNY SEIKEL, '12

Major: Economics and Management
Hometown: Rochester, Mich.

MARK STEVENSON, '12

Major: Economics and Management
Hometown: Clinton Township, Mich.

QUENTIN CIGOLARI (ESCIA)

Major: International Business
Hometown: Pontoise, France

CAROLE FOCARD (ESCIA)

Major: International Business
Hometown: Paris, France

ODILE GENET (ESCIA)

Major: International Business
Hometown: Pontoise, France

XAVIER JEGER (ESCIA)

Major: International Business
Hometown: Paris, France

SOPHIE SONG VILAY (ESCIA)

Major: International Business
Hometown: Paris, France

Faculty Sponsors: Charlene Crandell and Thierry Etchebarne (ESCIA)

For the third consecutive year, students from the Gerstacker Institute interested in international business paired with students from France to create an international and intercultural business plan. The Student Entrepreneurial Exchange (SEE) partnership, started in 2008 by founding institution ESCIA, brings together students from around the globe for the development of business plans and cultural exchange.

The original business plan idea is developed during a weeklong ESCIA seminar in France. After initiation of the project plan in France, further progress continues during the semester. This ongoing collaboration and interaction between the two groups is conducted through e-mail and videoconferencing in order to finalize the plan. During this time, students further develop the product concept identified at the seminar, conduct internal capabilities and external environmental analyses, complete market research, and develop a marketing and financial plan for the business. Then the French students pay a visit to their American counterparts to put the final touches on the plan and to make a final presentation, including at the Isaac Research Symposium.

The 10 Albion and ESCIA students incorporated each culture's diverse skill set to develop a plan for customized wine labeling. The business, "Wine is Mine," imports well known French wine with a customized label for celebratory occasions in the United States. The Albion students and ESCIA guests will present a plan that will demonstrate that "Wine is Mine" is a promising business venture.

SEE, a name coined by the students participating in the first seminar, is driven by values those students identified and defined: discover, create, share, and empower. The partnership provides a unique opportunity to grow as an individual, a student, and an entrepreneur. The most valuable aspect of SEE is the opportunity to become familiar with cultures from around the globe and to make lasting friendships. The goal of the partners is to expand to include more schools from more regions around the world.

Supported by: Gerstacker Institute, ESCIA, other SEE partners

GOOGLE ONLINE MARKETING CHALLENGE: Optimizing Internet Marketing through Google Adwords

Faculty Sponsor: Charlene Crandell

TEAM 1



Mark Stevenson, Kevin Markey, and David Budka. Missing: Alex Archer.

ALEX ARCHER, '13

Majors: Economics and Management, Biology
Hometown: Grand Ledge, Mich.

DAVID BUDKA, '13

Major: Economics and Management
Hometown: Clinton Township, Mich.

KEVIN MARKEY, '13

Major: Economics and Management
Hometown: Rochester Hills, Mich.

MARK STEVENSON, '12

Major: Economics and Management
Hometown: Tecumseh, Mich.

Businesses today are making budget cuts across the board, from personnel to advertising. However, often a reduction in the advertising budget can impact profits as well. Despite the current economic downturn, companies still hope to acquire new customers without spending an unreasonable amount of their budget on advertising. Thanks to the use of Google Ads, this has become a possibility.

When over half of the world's population uses the Internet, marketing a company's service to a specific audience becomes a major problem. Advertising through Google's AdWords program offers significant customizability and uses specific criteria to drive a company's message and services to the intended audience. With limiting factors such as geographic area, age-range, and household income, targeting that audience has become much simpler.

The business we chose was Stevenson Arbor Care, LLC in Clinton, Michigan. With the company's recent development of a Web site, it is expanding its area of marketing and advertising to reach a larger audience at a lower cost. Through the use of Google Analytics, our team will modify the Web site to optimize potential clients' search results, and through the use of Google Adwords we will create an enticing marketing campaign to convert those results into new clientele and revenue.

TEAM 2



Pat McCombs, Thomas Worden, Tim Wasmer, and Josh Freeland.

JOSH FREELAND, '11

Major: Marketing Management
Hometown: Coopersville, Mich.

PAT MCCOMBS, '11

Major: International Studies
Hometown: Brook Park, Ohio

TIM WASMER, '10

Major: Economics and Management
Hometown: Farmington Hills, Mich.

THOMAS WORDEN, '13

Major: Economics and Management
Hometown: Drummond Island, Mich.

Our goal in the Google Online Marketing Challenge was to select a business and optimize its Internet-based marketing. We

selected one of our group members' businesses, Wasmer Brothers Lawn Care and Landscaping, as our business. In the process of optimizing we had to research what key words would be most influential for this type of business on a Google search and use that knowledge to increase the traffic that would go to the company's Web site. Once we determined what key words to focus on we had to manage and optimize a budget given to us by Google to increase the standing of our company in various Google searches in hopes of increasing business traffic for the company. In our presentation we will discuss the basics of the competition, how we performed our research and optimized our campaign, and finally our successes and failures before, during, and after the campaign.

TEAM 3



Erika Nichols, Kasey Kaplan, and Ashley Hayes.

ASHLEY HAYES, '10

Major: Economics and Management
Hometown: Plymouth, Mich.

KASEY KAPLAN, '10

Majors: Economics and Management, Communication Studies
Hometown: St. Charles, Ill.

ERIKA NICHOLS, '10

Major: Economics and Management
Hometown: Greenville, Mich.

The Google Online Marketing Challenge is an international competition for students to learn about Internet marketing. For our project we have chosen a business in Jackson, Michigan that could benefit from our work. Step One is a sporting goods store carrying athletic shoes, clothing, and uniforms, and they also do their own screen-printing. Over

the course of the semester, we will be setting up a Google Analytics account to help gain information about the current Web site traffic and to monitor the traffic throughout the campaign. We will also be setting up a new Web site to help create more business in the screen-printing division of the company, and we will offer new ideas for the current Web site. At the end of our campaign we would like to have raised the number of “hits” to the site, built awareness of the company, and increased the number of customers coming to the store, leading to increased profits.

TEAM 4



Natalie Mikkola, Charlie LaNoue, and Allie Lewis. Missing: Mallory Woodrow.

CHARLIE LANOUE, '11

Major: Economics and Management
Hometown: Albion, Mich.

ALLIE LEWIS, '10

Major: Economics and Management
Hometown: Novi, Mich.

NATALIE MIKKOLA, '11

Majors: Economics and Management,
Psychology
Hometown: Clinton Township, Mich.

MALLORY WOODROW, '10

Major: Political Science
Hometown: Bloomfield Hills, Mich.

In today's economy, businesses need to allocate money wisely within their marketing mix. One of the easiest and most effective channels to use in marketing today is online advertising. Through online advertising, businesses are able to reach their target audience while obtaining beneficial success metrics that help them constantly modify their strategy.

With new, innovative services being released each year, Google is undoubtedly sitting at the top of the online advertising world in 2010. The main service they provide is Google AdWords, a keyword-targeted advertising program utilized by businesses all over the world. AdWords is popular and effective because each business, large or small, has control over its own budget and can instantly get feedback to change its strategy as needed.

To further our understanding of the phenomenon that is Google AdWords, we participated in the Google Online Marketing Challenge. This worldwide competition is designed to be a hands-on exercise for undergraduate or graduate students interested in a

future in the field of online marketing. The goal of the competition is to have student teams work with a local business to organize, manage, and optimize an interactive, online marketing campaign using Google's AdWords application.

After researching some local businesses, we selected Michigan Prints, a local art business. Our primary goals for the project will be to develop a targeted ad campaign to drive traffic to Michigan Prints' well designed Web site, while gaining exposure to a broad audience of potential customers. In order to achieve our goals we will conduct market research, perform a competitive analysis, and test unique keywords relevant to our target audience.

FOUNDATION FOR UNDERGRADUATE RESEARCH, SCHOLARSHIP, AND CREATIVE ACTIVITY (FURSCA)

The Foundation for Undergraduate Research, Scholarship, and Creative Activity (FURSCA) was established to promote and support student research, original scholarship, and creative efforts in all disciplines. Through a number of programs, taking place at all points in a student's career at Albion, FURSCA can help students pursue independent study in their areas of interest. Students work closely with a faculty mentor to develop and carry out research or other creative projects. Participation in such projects provides valuable experience beyond the scope of classroom work, and enhances a student's preparedness for future employment or graduate studies. Some examples of FURSCA programs are listed below.

Student Research Partners Program—

Geared toward first-year students, this program pairs a student with a faculty mentor to work on a project related to the faculty member's research or creative area. Students gain hands-on experience with scholarship in a specific field, and may elect to continue during their sophomore year. Participation is selective, based on high academic achievement, and stipends are awarded.

Research Grants—Students may apply for funds to support research or other creative projects. Students must work closely with a faculty adviser; however, projects are not limited to any particular discipline. Grants may be awarded to pay for supplies, printing costs, subject payments, software, or other costs associated with completion of the project.

Travel Grants—Students may be awarded travel funds to help cover expenses associated with travel to attend professional meetings at which they will present the results of their research or creative projects.

Summer Research Fellowship

Program—A select number of students may remain on campus during the summer, earning a stipend, to work on research or creative projects. In addition to working closely with a faculty adviser, students participate in weekly seminars with other students in the program.

THE ELKIN R. ISAAC ENDOWMENT

The Elkin R. Isaac Endowed Lectureship was created in 1991 by Albion College alumni in honor of their former teacher, coach, and mentor, Elkin R. "Ike" Isaac, '48. Isaac taught at Albion from 1952 to 1975 and coached basketball, track, and cross country. He led his teams to one Michigan Intercollegiate Athletic Association basketball title, six consecutive league championships in track, and three cross country championships. He also served as the College's athletic director and created Albion's "Earn, Learn, and Play" program and the "Albion Adventure Program." In 1975, Isaac joined the faculty at University of the Pacific and became athletic director in 1979. He retired there in 1984. He now lives in Florida.

Reflecting Elkin Isaac's lifelong interests in higher education and research, proceeds from the endowment are used to bring a noted scholar or public figure to campus each year to offer the Isaac Lecture and to visit with classes. In 1997, the Isaac Lectureship was expanded and is now associated with Albion College's annual Student Research Symposium, featuring presentations by students recommended by their faculty sponsors for outstanding independent study and research. The symposium now bears Isaac's name.

THE ISAAC ENDOWMENT COMMITTEE

Cedric W. Dempsey, '54
Ben E. Hancock, Jr.
T. John Leppi, '59
Thomas G. Schwaderer, '56
Leonard F. "Fritz" Shurmur, '54 (deceased)
John R. Taylor, '55

THE JOSEPH S. CALVARUSO KEYNOTE ADDRESS ENDOWMENT

Joseph S. Calvaruso, '78, and his wife, Donna, established an endowment fund in 2005 to support the annual Elkin R. Isaac Symposium keynote address. The keynote address now bears Calvaruso's name.

An Albion native, he currently serves as executive director of the Gerald R. Ford Foundation in Grand Rapids. Before joining the foundation, he was senior vice president and director of risk management for Mercantile Bank in Grand Rapids.

Active in the Republican Party on the state and national levels, Calvaruso is a member of the Gerald R. Ford Institute for Public Policy and Service Visiting Committee at the College.

In keeping with Calvaruso's personal goal to "try different things in life," the keynote endowment ensures the symposium will continue to provide an exceptional variety of presenters from the arts, sciences, social sciences, and humanities.

PAST ISAAC SYMPOSIUM SPEAKERS

Elkin R. Isaac Alumni Lecture

Emilio DeGrazia, '63 (1999)
James Misner, '66 (2000)
John Vournakis, '61 (2001)
Joseph Serra, '56 (2002)
Denise Cortis Park, '73 (2003)
John Porter, '53 (2004)
Elkin Isaac, '48 (2005)
Joseph Calvaruso, '78 (2006)
Eileen Hebets, '94 (2007)
James Beck, '97 (2008)
James Gignac, '01 (2009)

Joseph S. Calvaruso Keynote Address

Wade Davis (1999)
Stephen Jay Gould (2000)
Doris Kearns Goodwin (2001)
Kurt Vonnegut (2002)
Salman Rushdie (2003)
Gloria Steinem (2004)
Edward O. Wilson (2005)
Regina Carter (2006)
Steven Pinker (2007)
Carl Hiaasen (2008)
David Trimble (2009)

THE 2010 ISAAC STUDENT RESEARCH SYMPOSIUM COMMITTEE

Craig Bieler (Chemistry)
Sarah Briggs (Communications Office)
Jeffrey Carrier (Biology)
Gene Cline (Philosophy/Brown Honors Institute)
Chelsea Denault, '12
Lisa Lewis (Chemistry)
Beth Lincoln (Geological Sciences/Academic Affairs)
Vanessa McCaffrey (Chemistry/FURSCA)
Anne McCauley (Art and Art History)
Dean McCurdy (Biology/Brown Honors Institute)
Ryan Stowe, '10
Michael Van Houten (Stockwell-Mudd Libraries)