

# THE SIXTEENTH ANNUAL ELKIN R. ISAAC STUDENT RESEARCH SYMPOSIUM

## ALBION COLLEGE

APRIL 21, 2005

### SCHEDULE OF EVENTS

Thursday, April 21, 2005

- 8:30-10:30 a.m.      **Student Research Platform Presentations**  
*Refreshments will be served at each location listed below. See also detailed schedule of presentations on pages 4-6.*
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|--------------------------------------|--|
| Forum #1<br><i>Norris Center 103</i> | Forum #3<br><i>Putnam Hall 106</i>                       |
| Forum #2<br><i>Norris Center 101</i> | Forum #4<br><i>Bobbitt Visual Arts Center Auditorium</i> |
- 10:45 a.m.-Noon      **Honors Convocation**  
*Goodrich Chapel*
- 1:15-4 p.m.      **Student Research Platform Presentations**  
*See locations listed for morning session. Refreshments will be served at each location listed above.*
- 3:30-4:45 p.m.      **Student Research Poster Session**  
*Gerstacker Commons, Kellogg Center*
- 4-5 p.m.      **Elkin R. Isaac Lecture: Elkin R. Isaac, '48**  
**"Exercise: Combating the Aging Process"**  
*Bobbitt Visual Arts Center Auditorium*
- 7 p.m.      **Symposium Keynote Address: Edward O. Wilson**  
**"The Future of Life"**
- Welcome: President Peter T. Mitchell, '67  
Conferral of Honorary Degree: President Mitchell and Jeffrey C. Carrier  
Speaker Introduction: John K. Adams, '07  
*Goodrich Chapel*
- Book-signing and reception immediately following the program*  
*Bobbitt Visual Arts Center Lobby*

## THE ELKIN R. ISAAC LECTURE

### Elkin R. Isaac, '48

A member of the Albion College faculty from 1952 to 1975, Elkin R. "Ike" Isaac also served as head basketball coach (1953-1959), head track coach (1953-1962), and head cross country coach (1962-1969). He led his teams to one Michigan Intercollegiate Athletic Association (MIAA) basketball title, six consecutive league championships in track, and three cross country championships. He also served as athletic director.

Upon leaving Albion in 1975, Isaac joined the faculty at the University of the Pacific and became athletic director in 1979. He retired there in 1984.

As an Albion student, Isaac earned All-MIAA honors in 1943, 1946, and 1947 for his outstanding performance on the basketball court. He was captain and was voted Most Valuable Player of the 1947 team. He also played football for three years. Isaac was inducted into the Albion College Athletic Hall of Fame in 1989 and received the Hall of Fame's Lifetime Achievement Award in 1999.

He interrupted his college career from 1943 to 1945 to serve in the U.S. Air Force as a pilot during World War II.

In honor of Isaac's long-time support of Albion College athletics, the College's outdoor track, rebuilt and resurfaced in 1997, was named in his honor. The Elkin Isaac Track Drive was co-chaired by Cedric and June Luke Dempsey, both '54, with assistance from Thomas Schwaderer, '56.

The Elkin R. Isaac Endowed Lectureship was created in 1991 by Isaac's friends and former students. Today, this endowment has been expanded to fund the Elkin R. Isaac Student Research Symposium. Isaac will receive the honorary doctor of humane letters degree during this year's Honors Convocation held in conjunction with the Isaac Student Research Symposium.

Isaac and his wife, Edith, reside in Kalamazoo.



## SYMPOSIUM KEYNOTE ADDRESS

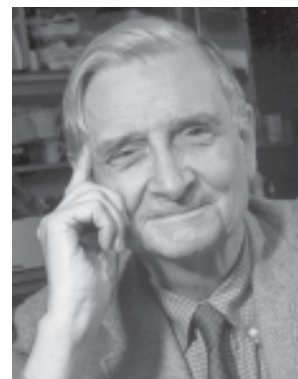
### Edward O. Wilson

Edward O. Wilson is one of the most highly respected scientists in the world today. Hailed as "the new Darwin" and one of "America's 25 Most Influential People" by *Time* magazine, Wilson won Pulitzer Prizes in 1979 and 1991 for his books *On Human Nature* and *The Ants*. Considered by many to be the father of the modern environmental movement, Wilson has made enormous contributions to the field of conservation.

In his most recent book, the bestselling *The Future of Life* (2002), Wilson offers a plan for saving the earth, drawing from science, economics, and ethics to argue that proper stewardship of the earth's biodiversity is not an option but a necessity. In 1975 Wilson's groundbreaking *Sociobiology*, about the social systems of nonhuman species, was broadly hailed as one of the century's premier scientific achievements. But the book's last chapter, which applied the same analysis to human behavior and culture, was widely controversial. With *Sociobiology* and other writings, Wilson "accomplished something few scientists can claim," *Time* noted; he created a new field of science: sociobiology. His 1992 book *The Diversity of Life*, which examines the magnitude of biodiversity and the threats to it, had a major public impact. In *Consilience: The Unity of Knowledge* (1998), he draws together the sciences, the humanities, and the arts to paint a broad picture of human knowledge.

Born in Birmingham, Ala., in 1929, Wilson earned his B.A. and M.A. from the University of Alabama, and his doctorate from Harvard in 1955. He received the prestigious National Medal of Science from President Jimmy Carter in 1976 for his work in the biological sciences, and in 1990, he won the highest scientific award in the field of ecology, the Crafoord Prize from the Royal Swedish Academy of Sciences. In 2001 *Time* said Wilson has enjoyed "one of the great scientific careers of the late twentieth century, a career that began in entomology with a particular passion for ants, but that has since reinvented itself with remarkable frequency, expanding its scope to encompass not just the earth's smallest creatures but the whole living planet."

The Pellegrino University Research Professor, Emeritus, at Harvard University, Wilson continues his entomological and environmental research at Harvard's Museum of Comparative Zoology.



## STUDENT PRESENTATION SCHEDULE – Thursday, April 21, 2005

### FORUM #1 – Norris 103

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8:30	Iain Charnley (Terstrie)	Standing in the Gap: A Ten-Year Retrospective Study of Free Clinic Use in Kalamazoo, Michigan
8:45	Brianna Granlund, Dana Sauter (Rohlman)	Thermodynamic Studies of the <i>Anabaena</i> Group I Ribozyme
9:00	Pamella Abghari (Rohlman)	Gossypol and Docetaxel as Pro-apoptotic Agents in the Treatment of Adrenal Cancer
9:15	William Green (Bollman)	M Men, a Monkey, and Some Coconuts
9:30	Sarah Carver (Erbe•nik)	Development and Application of Fluorescence In Situ Hybridization (FISH) in an Undergraduate Microbiology Laboratory
9:45	Katherine Niesen (Kennedy)	Individual Temporal Variation in Songs of the Male House Wren ( <i>Troglodytes aedon</i> )
10:00	Valorie White (McCurdy)	Assessing Invasive Species at the Whitehouse Nature Center through the Use of Geographic Information Systems
10:15	David Goodyear, Daniel Harris (Kennedy)	Sex Ratios and Sources of DNA in Nestling House Wrens and Tree Swallows
1:15	Michael Kopec (McCurdy)	Investigations into Sex-Distortion and Intersexuality in the Intertidal Amphipod <i>Corophium volutator</i> (Pallas)
1:30	Kapil Mandrekar (White)	Breeding Habitat of Secondary Cavity-Nesting Birds
1:45	Nicole Villiere (Green)	Analysis of the Degradation of Semi-volatile Organic Compounds and the Application to the EPA Holding Time Limit
2:00	Christopher Smith (Harris)	Substrate, Stoichiometry, and Solvent: Exploring a New Coupling Reaction Observed during the Oxidation of Organoboranes in Water
2:15	Stephanie Clark, Eric Grunow (Scheel)	Netrins: Creating Divergent Axon Morphologies
2:30	Katherine Dixon (Scheel)	Study of a Candidate Depression Gene in a Large Extended Family
2:45	Amy Hupp (Carrier)	Environmental and Climatological Effects on Nurse Shark Reproductive Behavior
3:00	Katherine Brewer (Ludington)	Creating a Patch of Polytetrafluoroethylene for Use on an Asymmetric Stent to Prevent Hemorrhagic Stroke
3:15	Jacqueline Fillinger (Green)	Leaded Paint in Pre-1970 Albion Residences
3:30	Erin Toth (Rohlman)	An Automated Fluorescence-Based Assay for the Group I Ribozyme
3:45	Emily Carvill (Lewis)	The Degradation of Marijuana as a Function of Time and Storage Conditions—A Collaboration with the Michigan State Police Forensic Science Division
4:00	Virginia Cangelosi (Harris)	Oxidation of Organoboranes: A Survey of Novel Substrates

### FORUM #2 – Norris 101

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8:30	Jordan Troisi (Christopher)	Money-Spending Disposition as a Moderator of the Relationship between Materialism and Other Individual Difference Variables
8:45	Jeremy Benton (Christopher)	Anxiety about Aging and Fear of Death: Predictions from Terror Management
9:00	Daniel Hartner (Otto, Anes)	Bilateral Redundancy Gain for Affective Stimuli
9:15	Janan Saba (Keyes, Dunham)	Satisfaction with College: Impact of an Intensive Summer Program
9:30	Courtney Rocho (Keyes)	Paternal Filicide
9:45	Corey Madura (M. Walter)	Individual Differences in Perceptions of Race and Sexual Orientation: An Experimental Investigation
10:00	Lori Karakashian (M. Walter)	Fear of Negative Evaluation Affects Helping Behavior
10:15	Stephen Fritz, II (Jechura)	Unconscious Priming of Mirrored Words: Explorations in Subliminal Perception
1:15	Laura Krasean (Keyes)	The Effect of Stress Management vs. Standard of Care Therapy in Subacute Back Pain Patients

1:30	Heather Holleman (Keyes)	Simulating Hallucinations: An Examination of Cognitive Abilities during Auditory Distraction
1:45	Brittany Harte (Mull)	Factors Predicting Child Custody Recommendations in Cases Involving Parental Substance Abuse
2:00	Kathryn Fraser (Mull)	The Development of Magical Thinking during Childhood
2:15	Katherine Vojtko (Christopher)	Dental Anxiety, Dental Fear, and Self-Esteem as Predictors of Dental Hygiene
2:30	Shannon McGuire (J. Walter)	Development of a Relational Aggression Questionnaire: Middle School Children's Goals and Strategies as a Function of Friendship Level
2:45	Ryan Sebolt (Franzen)	Studying Views on Civil Rights, Religiosity, and Homosexuality in the African American Community
3:00	Robert Koch (Mullin)	<i>Otaku</i> : Resistance to the Dominant Paradigm of Identity
3:15	Sarah Gebhardt (Keyes)	The Effect of Attending a Summer Sports Camp on Racial Preferences in Children
3:30	Lindsey Paskvan (Berkey)	Identity Formation in a Competitive Artistic Environment: Reflections of Midwestern Performing Arts Boarding School Alumni
3:45	Crystal DuBois (Keyes)	Children's Adherence to Racial Stereotypes: A Cognitive Developmental Framework

### FORUM #3 – Putnam 106

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8:30	Laura Jordan (Fogelin)	In Search of Legitimacy: The Case of Buddhist Nuns in Burma
8:45	Lindsay Elliott (Grossman)	Electoral Politics in Michigan: Convention Nominating Procedures for Statewide Office
9:00	Lauren Henderson (Hendrix)	The Ebonics Debate in the Classroom: A Study of Ebonics, Standard English Proficiency, and Pedagogy
9:15	Michelle Ilitch (Levine)	Pharmacy Benefit Managers and Their Impact on the United States Pharmaceutical Industry
9:30	Sam Hogg (Levine)	Raising the Stakes: MEAP and the Effects of the Michigan Merit Scholarships on Secondary and Postsecondary Education
9:45	Jessica Mackowick (Mullin)	Let Them Eat Cake: Homeless Shelters and the Cycle of Poverty
10:00	Karolina Maluga (Ariza)	Influence of School System on Albion's African American Youth and Their Perceptions of Success
10:15	Alexandra Anda (Guenin-Lelle)	Colonial Legacies and the <i>foulard</i> Affair: Rethinking French Identity
1:15	Samata Singhi (Saltzman)	Improving Access to Health Care in America: What Can Be Done?
1:30	Ligia Paina (Saltzman, Terstriep)	In Transition: The Post-Communist Evolution of the Romanian Health Care System
1:45	Michael Huff (Bedient)	Brand Management in Sports
2:00	Kristina Jelinek (Berkey)	Education Matters: Mexican/Mexican-American Migrant Youth in Michigan Secondary and Postsecondary Schools
2:15	Matthew Walters (Cocks)	German "Soft Power" and the European Union, 1990 to the Present
2:30	Benjamin Olbricht (Cocks)	Friedrich Olbricht: A Leader of the July 20 Plot against Hitler
2:45	Jacob Konkol (Cocks)	The Abraham Lincoln Brigade
3:00	Jayne Ptolemy (Sacks)	"It Ain't My Shame": Social Constructions of Rhetorical Sexual Culpability in the Antebellum Slave South
3:15	Yen Thieu (Dick, Steinhauer, Li)	Culture, Environment, Education, and Sustainable Tourism of a City in the Clouds: Sa Pa, Vietnam
3:30	Brett Braun (Dick)	The Albion Malleable Iron Company: A History of Race, Ethnicity, and Socioeconomics
3:45	Joe Zessin (Dick)	Albion, Michigan in the 1950s: Dreams and Realities of the Boom Years

### FORUM #4 – Bobbitt Visual Arts Center Auditorium

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8:30	Brinn Cronin (Starko)	"Triage": Writing a Three-Act Play
8:45	Jennifer Poole (Hendrix)	Words, Writing, and Emotion: The Role of Language and People in the Lives of Children
9:00	James Rider (Collar)	First-Person American in the Novels of Don DeLillo

(continued on next page)

9:15	Rebekah Beall (Mesa)	“A Field Guide to Home”
9:30	Carrie Howland (Mesa)	A New Vision: The Albion Arts Cooperative
9:45	Jennifer Paine (Crupi)	The Homeric Question, Unanswered
10:00	David Pierce (Madhok)	Ethical and Epistemic Norms of Journalism: An Analysis
10:15	Erica Flock (Madhok)	The Community and Nature: Theoretical and Experiential Approaches to Environmental Aesthetics
1:15	Amy Weinmeister (Wickre)	“Dwelling”
1:30	Rachel Lamphere (Ball, Balke, Williams)	“Voi, Che Sapete” from Mozart’s <i>Le Nozze di Figaro</i>
1:45	Kathleen Hornbacher (Wickre)	Is Fashion Art? A Discussion of the Aesthetic and Expressional Qualities of Dress
2:00	Laura Parker (Wickre)	Women in World War II Propaganda
2:15	Andrew Dill (Ball, Murdick)	Richard Strauss’ Concerto No. 1 in E-flat for Horn and Orchestra
2:30	Christopher Graves (McIlhagga)	Tried, Tested, and True: A Survey and Analysis of Improvisation Methods and Techniques in Public School Music Programs in Southern Michigan
2:45	Michael Bieniek (Ball, Mondoskin)	Darius Milhaud’s <i>Scaramouche</i> for Alto Saxophone
3:00	Cynthia Spurgat (Ball, Khoma, Uzur)	Concerto No. 4 in G Major
3:15	Jaime Hypes (Berkey)	Wringing, Twisting, and Screaming: Intimate Relations in the Songs of Early Blues Women
3:30	Ken Powell (Berkey)	Love, Sex, and Desire: The Role of Sodomasochistic Sexual Practices in Reinterpreting Romantic Narratives
3:45	Patrick Reilly (Guenin-Lelle)	<i>Le malentendu franco-américain</i>

## POSTER PRESENTATIONS – Gerstacker Commons, Kellogg Center, 3:30-4:45 p.m.

John Adams, Paul Roberts (Wilch, White)	Verification of Daily Cycles in Stream Stage and Turbidity in Rice Creek
Jennifer Bunde (Meloth)	Boom, Bust, Recovery: Explorations of Albion, Michigan—The Last Half-Century from an Educational Perspective
Brad Cavinder (Saville)	Repair of DNA Breaks Generated by the Excision of the <i>hobo</i> Transposable Element of <i>Drosophila melanogaster</i>
Lacey Doucet, Eric Mackres (White, Dyer)	Creating an Environmental Living-Learning House for Albion
Nicholas Fish (T. Lincoln, B. Lincoln)	Geochemistry of Amphibolites from the Black Hills, South Dakota
Beth Gruber, Shauna Paradine (French)	Progress toward the Synthesis of a New Class of Hypervalent Iodine Reagents
Brad Hauch (Kennedy)	An Experimental Examination of Responses to Song Complexity of the House Wren ( <i>Troglodytes aedon</i> )
Edward Lindow (Christopher)	First Impressions and Affective Reactions as Functions of Type of Economic Success
Danielle Lord (B. Lincoln, T. Lincoln)	Geochemistry of Absaroka Volcanic Rocks from the Heart Mountain Fault Zone, Park County, Wyoming
Natalie McKinney (Bieler)	Metal Fractionation Processes and Changes in Particle Size Distribution Caused by Household Cleaning Techniques
Michael Miller (Erbe•nik)	Skin and Hair Development: Examining the Role of Tg737, Kif3a, and the Primary Cilium
Marián Novak (Erbe•nik)	Isolation of the Xylose Regulator in <i>Thermoanaerobacter ethanolicus</i>
Benjamin Olbricht (Bieler)	Direct Measurement of the Lifetime of the NeBr <sub>2</sub> van der Waals Molecule as a Function of Isotopic Species
Stephanie Oosterhouse (Guenin-Lelle)	The Use of French Comics as a Complement to a French Language Curriculum
Kelly Parsell, Jordan Troisi (Lucas)	Relationships among Perceived Stress, Safety and Social Health Behaviors, and Openness to Experience
Jess Possehn (Moss)	Innovations in Injury Rehabilitation Relative to Shoulder Joint Biomechanics: A Case Study

## ABSTRACTS OF STUDENT PRESENTATIONS

### PAMELLA ABGHARI, '05

#### Gossypol and Docetaxel as Pro-apoptotic Agents in the Treatment of Adrenal Cancer

Faculty Sponsor: Christopher Rohlman

Major: Chemistry  
Hometown: Bloomfield Hills, Michigan

Adrenal cortical carcinomas are rare but highly malignant tumors with poor prognosis. The primary objective of this pre-clinical study is to test the hypothesis that a combination of the drugs gossypol and docetaxel will be more effective than either one individually. This combination will induce apoptosis, programmed cell death, in cancer cells with high expression levels of the protein Bcl-XL, but will have little effect on cancer with low Bcl-XL and Bcl-2, two kinds of proteins that inhibit apoptosis. Studies were done on whole animals as well as cancer cell cultures. Two different human adrenal cortical carcinoma cell lines, RL-251 and NCI-H295, were grown in flasks for in vitro studies. These cells were later inoculated into SCID mice (Severe Combined Immunodeficiency). Tumors grew in each flank, and the mice were used for in vivo studies. Both cell lines differ in the expression of the protein Bcl-XL, which allows the study to compare the drugs' interactions with the expression of Bcl-XL versus cell lines without the anti-apoptosis protein. The results of our study supported our hypothesis, displaying significant decreases in the size of the tumor and cancer cell lines in each case.

*Supported by: Adventis. The research was conducted at the University of Michigan Kresge Laboratories under the guidance of David Scheingart, M.D., and Ricardo Benitez.*



### JOHN ADAMS, '07

Major: Geology  
Hometown: Dearborn, Michigan

#### PAUL ROBERTS, '07

Major: Geology  
Hometown: Dimondale, Michigan

#### Verification of Daily Cycles in Stream Stage and Turbidity in Rice Creek

Faculty Sponsors: Thomas Wilch, Douglas White

Daily cycles of hydrological parameters of Rice Creek, a tributary to the Kalamazoo River, illustrate the dynamic nature of stream systems. Our investigation builds upon previous research by Albion College students and faculty and focuses on daily cycles of two parameters: stage, or stream height, and turbidity, an index of water clarity. Cycling of these parameters has not been described in the literature for Michigan streams. An initial hypothesis was that these cycles were artifacts of the instrumentation; however, numerous control experiments rejected this hypothesis. Stage, recorded with unattended pressure transducers, showed strong daily cycles. Field measurements verified a cycle, although there appears to be a discrepancy between the two datasets. We hypothesize that this discrepancy is due to uncertainty in barometric pressure correction.

Future research will focus on resolving this discrepancy and modifying stream gauging techniques. Regular cycles in stream stage illustrate the dynamic nature of watershed hydrology. Studies of these cycles will contribute to our understanding of processes important to watershed management. Turbidity was measured optically with an unattended probe



Adams



Roberts

and directly by total suspended solids analysis with a depth-integrated sampler. A strong correlation of these two datasets suggests that turbidity cycles are not due to instrumental artifacts. Daily turbidity cycles have important implications for water quality and for stream monitoring. Future research will investigate causal mechanisms for turbidity cycles.

*Supported by: FURSCA-Kresge Fellowship (Adams), FURSCA-Hyde Fellowship (Roberts)*

### ALEXANDRA ANDA, '05

#### Colonial Legacies and the foulard Affair: Rethinking French Identity

Faculty Sponsor: Dianne Guenin-Lelle

Major: International Studies  
Hometown: Quito, Ecuador

As of September 2004, the French government's new policy on secularism for public schools was put into effect. This law, known as *la nouvelle loi*, forbids all students to wear "ostentatious" religious symbols to public schools. However, the main issue remains that Muslim girls are no longer allowed to wear the *hijab* to their schools. If they ignore the law, they will be suspended from their institution.

Yet, in Islam, a girl who does not wear a headscarf at all times is going against one of the most important values of her religion. For the French, on the other hand, it is about ensuring that secularism, one of the most important values of the Republic, remains intact.

Will it be possible to find a consensus? What will happen to girls who choose to respect their religious values? Based on historical and sociological analysis of Islamic and French culture, as well as current events in France, this study will take you on a journey back into the twentieth century to analyze the events and phenomena that culminated in *la nouvelle loi*. In the end, I suggest that even though it may seem as if France is simply protecting the secularist tradition, *la nouvelle loi* hides within itself an entire century of colonialism, immigration, racism, struggle,



violence, and fear of Islamization. The call to rethink French identity and accept its multiculturalism is more needed than ever.

## REBEKAH BEALL, '05

### “A Field Guide to Home”

Faculty Sponsor: Helena Mesa

Majors: English, Spanish  
Hometown:  
Muncie, Indiana



We learn places; we know places. They circle through our past. In everyone's life, there is at least one place we can call up, triggered in the scent of wood smoke, in fingering a certain fabric, in a slant of autumn light. These places are our homes. By home, I do not necessarily mean a dwelling-place but rather a landscape, a location, the tiniest corner to which we arrive with a sense of relief, with a feeling of homecoming.

This creative thesis centers this sense of home in the agricultural landscape of north-central Indiana, but travels as far as Argentina, Chile, and Lake Superior. It consists of six related prose pieces: three short stories and three linked essays. The works examine the ways people know and experience these places. The landscapes intertwine with both the family and personal histories of the characters to contribute to an understanding of home. This exploration attempts to show the connections that link one landscape to the next, broadening and deepening the reader's sense of home-place. The goal is for the audience to understand the impact of place on the characters, be able to hear the voice of landscape in the thesis, and feel an attachment to it.

## JEREMY BENTON, '05

### Anxiety about Aging and Fear of Death: Predictions from Terror Management

Faculty Sponsor: Andrew Christopher

Majors: Psychology, Religious Studies  
Hometown:  
Oxford, Michigan



As the United States population ages, society needs to be prepared to face new challenges associated with the anxieties about aging and fears of death. This research advances understanding of the factors that predict fear of death.

Our sample of 167 people was taken from two small communities and a liberal arts college in southern Michigan. These individuals completed measures of death anxiety, aging anxiety, self-doubt, locus of control, and two types of religiosity, intrinsic and extrinsic.

Principal components analysis revealed two types of death anxiety. One type was called *tangible death anxiety*, and is the type a person can see happening to a dying person. Example statements of tangible death anxiety included “I am afraid of dying in a fire” and “Discovering a dead body would be a horrifying experience.” The other type of death anxiety was called *existential death anxiety*, and is the type associated with fears about what occurs after one dies. Example statements of existential death anxiety included “I am afraid there is no afterlife” and “I am afraid I may never see my children grow up.”

Path analyses revealed that locus of control and self-doubt were both positively predictive of tangible death anxiety, but not existential death anxiety. However, both intrinsic and extrinsic religiosities were predictive of existential death anxiety, but not tangible death anxiety. Different forms of aging anxiety differentially contributed to these relationships. These results suggest that anxiety about death is a multidimensional phenomenon that may be rooted in different sources.

Supported by: FURSCA

## MICHAEL BIENIEK, '05

### Darius Milhaud's *Scaramouche* for Alto Saxophone

Faculty Sponsors: James Ball, Brent Mondoskin

Major: Music  
Hometown: Troy,  
Michigan



Darius Milhaud was born to a Jewish family in 1892. At the age of seventeen he attended the Paris Conservatoire as a violinist, but soon switched to composition. He became close friends with the diplomat-poet Paul Claudel, who took Milhaud to Brazil in the late 1910s. This trip would forever affect Milhaud's composing, as his music shows a strong Latin American flavor. Though he was known to experiment with polytonality, his compositions show clear influences from Latin American music as well as jazz.

Milhaud wrote *Scaramouche* using incidental music from Moliere's *Le medecin volant*. *Scaramouche* is the name of a character taken from Italian theater. He is a rogue adventurer and swordsman, and is typically the servant of another character. Milhaud composed this piece in 1937 for a Parisian children's theater group. Originally written for two pianos, the music was rearranged for solo alto saxophone and orchestra, as well as B-flat clarinet and orchestra.

## BRETT BRAUN, '05

### The Albion Malleable Iron Company: A History of Race, Ethnicity, and Socioeconomics

Faculty Sponsor: Wesley Dick

Major: History  
Hometown: Westland, Michigan

The Albion Malleable Iron Company conducted business in Albion, Michigan, for 114 years before its closing in 2002 sent shock waves through the community. It produced high-quality iron castings from a variety of metals for numerous customers throughout the Midwest. “The Malleable,” as it was known by those who worked there, provided a place of steady employment for the city, and helped to

put Albion on the industrial map. Perhaps the biggest contribution that the Malleable made to Albion is that it helped to develop a diverse population within the city.

African Americans came from the Deep South,

Mexican-Americans came from Texas, and even some Europeans came from across the Atlantic to work at the Malleable. The Malleable nurtured this diverse workforce and became known as “the Mother Hen of Albion.” The impact of the factory on the city and its employees was studied, and special attention was paid to the oral histories given by former employees. This study is based on research done at the Local History Room of the Albion Public Library and the Albion College Library, and also on interviews conducted by the researcher. This project was a part of a NCUR/Lancy Initiative study entitled, “Boom, Bust, Recovery: Explorations of Albion, Michigan—The Last Half-Century.”

*Supported by: FURSCA, NCUR/Lancy Initiative*

## KATHERINE BREWER, '05

### Creating a Patch of Polytetrafluoroethylene for Use on an Asymmetric Stent to Prevent Hemorrhagic Stroke

Faculty Sponsor: Martin Ludington

Major: Physics  
Hometown: Clarence, New York

Stroke is the third leading cause of death in the United States behind other forms of heart disease and cancer. One common type of stroke is due to a hemorrhage. A hemorrhagic stroke may be caused by an aneurysm—a ballooning of the vessel wall. In order to prevent this type of stroke the Toshiba Stroke Research Center at the State University of New York at Buffalo is developing an asymmetric stent, a stent with a patch on the side, to block blood flow into the opening of the aneurysm. In this study, a plastic



called polytetrafluoro-ethylene, commonly known as Teflon or PTFE, was tested to determine if it could be used as a patch.

In order to prevent the potential blockage of perforator vessels, holes must be able to be made in the PTFE. The holes must be small (on the order of 50 microns) and clean. These holes must also be able to be put into a pattern. Using a welding laser, tests were conducted to determine the optimum settings to achieve a quality patch for the stent. It was found that the laser settings for creating a patch are best at 170 Volts, 3 millisecond shot, 8 shots and 15 shots per second. With these settings a patch was created that is able to be used in experimentation. For medical use, the settings would have to be further refined so that a more consistent result could be achieved.

## JENNIFER BUNDE, '05

### Boom, Bust, Recovery: Explorations of Albion, Michigan—The Last Half-Century from an Educational Perspective

Faculty Sponsor: Michael Meloth

Major: English, Elementary Education Certification  
Hometown: Albion, Michigan

This research project was a continuation of Nick Mourning's work which began during the summer of 2003 for his NCUR/ Lancy project. Due to time constraints, Mourning completed an initial portion of this work. The research was continued during the summer of 2004 for NCUR/ Lancy with an examination of how local African American educators from the 1950s through the mid-1970s characterized the “Boom, Bust, and Recovery” of Albion, Michigan. Data were collected through audio- and video-recorded interviews or “mini-oral histories.” This particular study is of interest as the experience of these teachers, particularly those recruited from the South, is an important, yet undocumented, facet of Albion's history. This project is also very valuable and important to individuals from the Albion community as it contains information that is vital to future teachers and students, as well as those



individuals interested in the Albion Public Schools in order for them to gain a better sense of the history.

The first part of the study consisted of locating and interviewing seven African-American teachers, some of whom came from the South and others who were from the Albion area. Initial results suggest that, although African American teachers were actively recruited to work in Albion Public Schools, they were hired only to teach black children. Elementary teachers and their students were assigned to segregated schools, and while African American and white students went to the same local high school, it was not until the late 1950s/early 1960s that the high school employed its first black teacher. The second part of the study required further examinations of the teacher interviews as well as research about the history of the Albion Public Schools located in books, libraries, newspapers, and other accounts. Important pieces from the teacher interviews and research about Albion Public Schools were compiled in order to construct a documentary. The documentary includes vintage photos and articles about Albion's public schools from the Boomtown Era, some video clips from all of the teacher interviews, and some narration.

*Supported by: FURSCA, NCUR/Lancy Initiative*

## VIRGINIA CANGELOSI, '05

### Oxidation of Organoboranes: A Survey of Novel Substrates

Faculty Sponsor: Clifford Harris

Major: Chemistry  
Hometown: Grand Rapids, Michigan

Green synthetic organic chemistry research develops environmentally friendly methods to improve industrial chemical processes.

In an attempt to discover a green way to produce alcohols, a new reaction was discovered. The expected products—alcohols, aldehydes, and carboxylic acids—were observed in addition to a carbon-carbon (C-C) coupled product. This observation is important because the formation of C-C bonds is still a challenge for organic chemists. Coupling reactions “tie” two separate molecules together by forming





bonds between atoms. For example, a molecule originally containing eight carbons is doubled in size by adding it to another, producing a new molecule twice as long, containing 16 carbon atoms. In order to explore the possibilities of the coupling reaction, various organoboranes were oxidized under these conditions, and it was found that the coupling occurs between  $sp^3$  and  $sp^2$  carbons as well as between carbons and halogens.

Supported by: FURSCA

### SARAH CARVER, '06

#### Development and Application of Fluorescence In Situ Hybridization (FISH) in an Undergraduate Microbiology Laboratory

Faculty Sponsor: Luti Erbe•nik

Major: Biology  
Hometown: Albion, Michigan

Fluorescence in situ hybridization (FISH) is a rapid, sensitive, and versatile cell biology technique, yet it has seldom been used in an undergraduate laboratory.



Recently, FISH has been developed in two international research laboratories as a method of choice to detect *Escherichia coli*, a fecal coliform. Unlike most traditional aquatic bacteriology tests, FISH can be completed within a working day.

The oligonucleotide probe used to detect the microorganism(s) can be specific for a phylogenetic group, species, or even a strain of bacteria. We have used a fluorescein-labeled 19-mer previously shown to be specific for *E. coli* 16S ribosomal RNA to detect mid-log *E. coli* and *Enterobacter aerogenes* (negative control) cells. Bacteria were attached to a nitrocellulose filter via membrane filtration and subjected to hybridization with the probe. Both the cells stained with a nucleic acid binding dye DAPI (4'-6-diamidino-2-phenylindole) and the oligonucleotide probe were easily detected within 2.5 hours after harvesting the sample. The method is still being optimized in order to minimize the background fluorescence observed with *E. aerogenes*.

Incorporation of FISH into an undergraduate microbiology laboratory to detect fecal coliforms would allow for rapid screening of

fresh water and the assessment of water quality by the students. This would further increase students' interest in environmental sciences whereby an application of a modern technique is used in a project with tangible outcomes and a sense of ownership.

Supported by: FURSCA

### EMILY CARVILL, '05

#### The Degradation of Marijuana as a Function of Time and Storage Conditions—A Collaboration with the Michigan State Police Forensic Science Division

Faculty Sponsor: Lisa Lewis

Major: Chemistry  
Hometown: Grand Blanc, Michigan

The decomposition of tetrahydrocannabinol (THC), the active ingredient in marijuana, was measured as a function of storage conditions. The marijuana used for this study was obtained by the Michigan State



Police Forensic Science Division (MSP FSD)—Sterling Heights Laboratory in May 2004. This plant material was stored in three different types of containers and then placed under different environmental conditions. Paper bags, plastic bags, and glass test tubes were used as storage containers, and these containers were placed in light and dark environments, in a freezer ( $-20^{\circ}\text{C}$ ), and in a moist environment to induce mold growth. Results suggest that storage at  $-20^{\circ}\text{C}$  inhibits the decomposition of THC. The presence of mold has been shown to increase the rate of degradation. Based on these initial data, it appears that the best way to decrease the decomposition of THC in marijuana is to store it in plastic in the freezer.

Supported by: FURSCA

### BRAD CAVINDER, '04

#### Repair of DNA Breaks Generated by the Excision of the *hobo* Transposable Element of *Drosophila melanogaster*

Faculty Sponsor: Kenneth Saville

Major: Biology  
Hometown: Tekonsha, Michigan

The survival of a species depends on the conservation of DNA from one generation to the next. As such, repair of damaged DNA is of the utmost importance.



Unrepaired or incorrectly repaired DNA can lead to cell death, cancer, or mutations that may be passed on to the next generation. Although there are many types of aberrant DNA structural changes, most of these arise from one or more breaks in DNA.

DNA double-strand breaks (DSBs) can occur because of exogenous mutagens or endogenous activities such as V(D)J recombination and the transposition of a transposable element. Several mechanisms have evolved to repair DSBs. In *Drosophila melanogaster*, the study of DSBs has primarily utilized the transposition of the *P* transposable element, and it has been determined that a DNA repair mechanism referred to as synthesis-dependent strand annealing (SDSA) pathway is used to repair *P* element-induced DSBs. The excision of the *hobo* transposable element in *D. melanogaster* is thought to produce a different kind of DSB than *P* element, and the subsequent repair of these breaks is thought to be a different mechanism called non-homologous end-joining (NHEJ). To determine if this is the case, I analyzed the DNA sequences generated by the repair of DSBs following *hobo* excision. I found four types of repair products that cannot be fully explained by either SDSA or NHEJ mechanisms alone. The data suggest that a repair mechanism involving both SDSA and NHEJ may be involved in the *hobo*-generated DSB repair.

Supported by: FURSCA

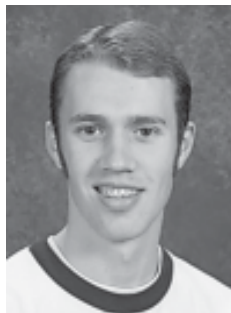
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**IAIN CHARNLEY, '05****Standing in the Gap: A Ten-Year Retrospective Study of Free Clinic Use in Kalamazoo, Michigan**

Faculty Sponsor: Amy Terstriep

Major: Biology  
Hometown: Augusta, Michigan

The issue of health care is of great concern as close to one out of every six Americans are uninsured in the United States today, and the number continues to grow. While in Michigan the percentage of uninsured individuals is lower than the national average (16.7%), 11.7% remain uninsured, and an estimated 63% of these are working individuals in their early adulthood. The cumulative effects of increased physical and mental health risks in this population not only manifest themselves in lost productivity, but also in neglect of chronic illness, delay of treatment, and overall diminished health status.



The First Presbyterian Church Health Clinic in Kalamazoo, Michigan, serves the uninsured population with over 3,100 visits in urgent care and medication assistance programs annually. In order to better understand the uninsured population to be served, ten years of demographic and diagnosis/referral information (1995-2004) was collected and analyzed for trends within the population and in the hopes of establishing a baseline for the target population of uninsured individuals. In ten years the clinic witnessed a significant increase in Medicaid patients, the unemployed, and Hispanics. Overall, race, income levels, and diagnoses remained static. The uninsured baseline for Kalamazoo County indicates that this patient population is concentrated in the 19-40 age group, with disproportionately high numbers of minority patients living below the poverty level. The uninsured are primarily seeking urgent care for respiratory illness, treatment of hypertension, diabetes, and dental care. The population also indicates increased presence of untreated mental illness, yet referral rates do not match the prevalence of diagnosis.

These findings allow further clarity in the clinic's mission and effectiveness. The clinic has begun canvassing businesses and neighborhoods

to reach the target demographic while also stressing the importance of establishing consistent primary care. New initiatives, made possible through grants and increased voluntary support, will now focus on providing collaborative and patient-centered care, especially in the realm of mental health, while also increasing the clinic's leverage on policy issues at the local, state, and national levels.

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**STEPHANIE CLARK, '06**Major: Biology  
Hometown: Port Huron, Michigan**ERIC GRUNOW, '05**Major: Biology  
Hometown: Saginaw, Michigan**Netrins: Creating Divergent Axon Morphologies**

Faculty Sponsor: Molly Scheel

During embryonic nervous system development, axons must grow and make proper connections with targets within the body. This process is referred to as pathfinding and is regulated by secreted guidance molecules, many of which are conserved among a variety of organisms, including humans. Much of the research on nervous system development has focused on the similarities between different organisms. In this project, we



Clark



Grunow

are interested in examining the guidance molecule netrin, and how this protein regulates the development of divergent nervous systems. We have worked to clone netrin genes from a variety of arthropods. To date, we have successfully cloned two netrin genes, *afnet-1* and *afnet-2*, from the crustacean *Artemia franciscana*, an organism that has a unique pattern of axon guidance. An antibody to the *afnet-1* protein was generated and used to elucidate a novel pattern of netrin expression in *Artemia*. This antibody was also found to cross-react to netrin proteins in other insect and

crustacean species, a fortunate discovery that will help us to study netrin expression across the arthropods more efficiently. We are beginning to use this antibody to stain other crustaceans and insects and to compare their nervous system development. This research will enhance our understanding of how gene expression can cause variations in the nervous systems of different organisms. It is also medically relevant because a better understanding of how the nervous system develops could lead to cures for Alzheimer's or other neurodegenerative diseases.

*Supported by: FURSCA, National Institutes of Health, Foundation for Interdisciplinary Study, Albion College Faculty Development*

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**BRINN CRONIN, '05****"Triage": Writing a Three-Act Play**

Faculty Sponsor: Robert Starko

Major: English  
Hometown: Troy, Michigan

It is an old idea that truth is dependent on the person who is telling it: epic poems such as *The Aeneid* revisited the story of *The Iliad* from the Trojan perspective, rewriting old Greek heroes in a less flattering light.



Even now, modern authors such as Gregory Maguire retell modern classics like *The Wizard of Oz* (i.e., the novel and Broadway musical *Wicked*) from a different point of view.

I explore this theory in my original play "Triage," in which three characters each get a chance to tell their story of the same cold winter night. The dark comedy evolved through a series of drafts, discussions, staged readings, and finally a full performance during Albion College's Workshop Theatre. I reflect on the challenges of the art form and the impact of a director on the final presented product. The process is discussed, as well as trials, tribulations, and ultimate discoveries.

## ANDREW DILL, '07

### Richard Strauss' Concerto No. 1 in E-flat for Horn and Orchestra

Faculty Sponsors: James Ball, Nick Murdick

Majors: Chemistry, Music  
Hometown: Ann Arbor, Michigan

In 1883, when Strauss was only 18 years of age, he composed his first horn concerto. The piece was written for his father who was a professional horn player. It is now one of the most popular horn concertos to date.



The first movement starts with a grandiose hunting fanfare. It then moves to a more lyrical section. By the end of the movement, the melody soars upward.

The French horn is a very complex instrument, and one of the most difficult of the brass instruments to play. Early composers couldn't make horn parts with all the possible pitches, because there weren't valves until the late nineteenth century. When Strauss composed the concerto, valve horns with extended capabilities were new, so the concerto could include more pitches than other pieces in the past.

I began to work on the piece last summer and had ample time to prepare for the Albion College concerto competition in February. One difficulty I encountered in the piece was the sheer range of it; it was very high at some points and required plenty of air and concentration. However, the biggest challenge for me was memorizing the music, something I had never done before. After I spent many hours in the practice room, rehearsing continuously, the piece began to sound like a concerto. Once the piece was memorized, it just had to be fine-tuned and put together with the orchestra. I will be performing this work in the Concerto Concert on April 24 accompanied by the Albion College Symphony Orchestra.

## KATHERINE DIXON, '06

### Study of a Candidate Depression Gene in a Large Extended Family

Faculty Sponsor: Molly Scheel

Major: Biology  
Hometown: Clinton Township, Michigan

While the cause of depression remains unknown, genetics may play a key role. Depression is thought to be a complex disease, caused by multiple genes and gene-environment interactions.



Complicated diseases are often studied in families that have a particularly severe form of the disease. Such an approach was utilized to study a genetic mutation of a candidate depression gene in a large extended family. In this study, many family members carry a mutation of a candidate depression gene, and it was noted in initial clinical assessments that the mutation tends to be found only in depressed patients. It is hypothesized that this mutation may be a factor in the cause of depression.

We tested this hypothesis through a variety of molecular genetic methods. A process called genotyping was used to test for presence of the mutant gene in each individual family member. We also used a microarray approach to observe changes across the genome in individuals carrying the wild-type vs. mutant allele of the candidate depression gene. I hope to aid in the development of microarray exercises for teaching labs at Albion. We also created two viruses, one that contains the mutant form of the gene, the other containing the wild-type form of the gene. The viruses will later be injected into neural stem cells of mice so that the mutation's role in neuronal development can be tested.

*Supported by: FURSCA. This research was conducted at the Yale University School of Medicine under the guidance of Arthur Simen, M.D., Ph.D., and Ronald Duman, Ph.D.*

## LACEY DOUCET, '05

Majors: Art, Environmental Studies  
Hometown: Huntington Woods, Michigan

## ERIC MACKRES, '05

Major: Political Science  
Hometown: Manchester, Michigan

### Creating an Environmental Living-Learning House for Albion

Faculty Sponsors: Douglas White, W.C. Dyer

The Albion College Environmental House will be a sustainable living-learning center for student residents who collaborate closely with interdisciplinary faculty and staff.

The house will be a community dedicated to the practice and promotion of a sustainable lifestyle, linked academically to the Institute for the Study of the Environment.

Curriculum will be designed to help foster the students' investigation of, and ability to manage, systems such as physical (e.g., heating, cooling, lighting), biological (e.g., foods, grounds, gardening), and cultural (e.g., consumerism, entertainment). This unique residential and scholarly environment will allow students to evaluate critically and take control of their daily actions, as well as be a part of creating a positive legacy for the future.

The concept was born in summer 2003, after an Environmental Institute-sponsored field trip visit to a LEED-certified green building in the Chesapeake Bay region. This visit led to the writing of a comprehensive business proposal and a comparative study for an environmental house for Albion in the summer of 2004. Committee meetings between students, staff, and faculty took place into the spring 2005 semester and culminated recently in College approval of the proposal. E-house is expected to open in August 2005.

*Supported by: FURSCA, Institute for the Study of the Environment, Carl A. Gerstaecker Liberal Arts Institute for Professional Management.*



Doucet



Mackres

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**CRYSTAL DUBOIS, '05****Children's Adherence to Racial Stereotypes: A Cognitive Developmental Framework**

Faculty Sponsor: Barbara Keyes

Majors: Psychology, History  
Hometown: Stanwood, Michigan

Participants (N = 139) from a racially homogenous elementary school (K-4) in western Michigan completed two measures of skin-color stereotype adherence: a forced choice computer game and the



Multi-Response Racial Attitude (MRA) measure. The results were similar to those found in previous research with children demonstrating strong positive white and negative black stereotype adherence until second or third grade when stereotype adherence declined significantly. The second-grade participants differed on their level of stereotype adherence as a function of the task they completed; on the computer task second-graders responded similarly to the younger participants displaying strong stereotype adherence, whereas on the MRA the second-graders responded similarly to the older participants displaying reduced stereotype adherence. Results were discussed in terms of cognitive developmental theory of prejudice. Implications of the type of measurements used to assess racial prejudice and interventions to reduce stereotype adherence were also discussed.

*Supported by: FURSCA, Psychology Department*

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**LINDSAY ELLIOTT, '05****Electoral Politics in Michigan: Convention Nominating Procedures for Statewide Office**

Faculty Sponsor: Andrew Grossman

Major: Political Science  
Hometown: Pittsford, Michigan

Under a federal system, sovereign states are capable of creating their own structural systems in which to nominate and elect candidates for office. Michigan is unique in that party-run nominating conventions are still used to select candidates for the statewide offices of lieutenant governor, attorney general, secretary of state, and state treasurer. Conventions were used during the time of machine politics, but during the Progressive Era most state conventions were replaced with the direct primary. Is it possible that the convention system used throughout the nineteenth and twentieth centuries, and currently still used in Michigan, could be a viable alternative to the primary? In order to analyze the merits of the convention, I ask two questions which drive at fundamental criteria that any nominating system should satisfy. First, does the theoretical framework of the nominating system fit with the democratic values of America? Second, if the theoretical framework does correspond with democratic values, are these values then put into action accordingly? Using the state of Michigan as a case study, I argue that the nominating convention shows potential as an effective system to name candidates for statewide offices.

*Supported by: FURSCA*

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**JACQUELINE FILLINGER, '07****Leaded Paint in Pre-1970 Albion Residences**

Faculty Sponsor: David Green

Major: Chemistry  
Hometown: Grand Ledge, Michigan

The concentration of lead in paint was limited to 0.06 weight percent by the United States Environmental Protection Agency in 1978. However, homes built before this date may still have residues of paint with higher and potentially dangerous concentrations. Because Albion, Michigan, has many homes built before this limit was imposed, it is possible that some residents are being exposed to leaded paint. Two phases were completed for this study in which paint samples were collected for analysis: (1) from randomly selected houses in Precinct 2; and (2) from houses of Albion College staff volunteers who live in Albion. Samples were prepared using NIOSH Method 7082 and then analyzed using inductively coupled plasma-atomic emission spectrometry. In both phases, comparable amounts of "leaded paint" and "potentially hazardous leaded paint" were found, 85% and 86% of the homes sampled. We conclude from this evidence that leaded paint is a problem in Albion that needs attention as part of the city's economic recovery program.

*Supported by: FURSCA, NCUR/Lancy Initiative*

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## NICHOLAS FISH, '08

### Geochemistry of Amphibolites from the Black Hills, South Dakota

Faculty Sponsors: Timothy Lincoln, Beth Lincoln

Major: Physics  
Hometown: Lapeer, Michigan

The goal of my research is to characterize the amphibolites on either side of a north-south trending fault zone in the metamorphic core of the Black Hills of South Dakota. These amphibolites are



metamorphosed mafic igneous rocks. Prior work has shown that to the east of the fault zone, the metasedimentary rocks are more chemically mature than those west of the zone. To accomplish the goal of this research, the amphibolites were analyzed using X-ray fluorescence to determine if their composition also varied across the zone.

The bulk of the amphibolite samples analyzed have similar major and trace elemental abundances. The samples from either side of the zone cannot be discriminated using any common petrologic diagrams and comparative methods. Chemically, most of the samples are similar to olivine normative tholeiites, a common type of volcanic rock. Since olivine tholeiite is such a common rock type, these analyses cannot be used to determine the number and timing of igneous events.

There are, however, some samples that are unusually iron-rich. All of these samples were located within the zone. It is possible that a pre-faulting suite of high iron volcanic rock is represented by these samples. More analyses of these samples are needed to further understand their distribution.

*Supported by: FURSCA, National Science Foundation, Department of Geological Sciences*

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## ERICA FLOCK, '05

### The Community and Nature: Theoretical and Experiential Approaches to Environmental Aesthetics

Faculty Sponsor: Bindu Madhok

Major: English  
Hometown: Waterford, Michigan

Environmental aesthetics is a relatively new field in philosophy. It is based on the notion that environments of all kinds, that our daily lives, can offer us rich aesthetic experiences quite different from that of the appreciation of art. Contemporary writers in the field have been mainly concerned with defining an appropriate response to nature in particular. They ask what sources we should draw on when making aesthetic judgments towards the environment.

In my thesis, I compare and contrast the works of two prominent thinkers, Allen Carson and Emily Brady, to determine whose account of the foundations of environmental aesthetics I find to be most justified. Carson, who many consider the first contemporary environmental aesthetician, believes that one can only appreciate something by having scientific knowledge about it beyond the initial reactions one might have. Brady gives a critique of this model and says that the sources we draw on should be multifaceted depending on the situation and stresses the notion of disinterestedness as an ethical component.

I adopt a compromise position between the two theorists and apply it to interviews that I conducted over the course of the year in a small northern Michigan town and a suburban township in southeast Michigan. My hope is to both uncover the ways that laypeople talk about nature and their living environments, and to perhaps find patterns in the way that people from a certain living space describe their surroundings. In this way, I also examine the practicality of the models that Brady and Carson have presented.



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## KATHRYN FRASER, '05

### The Development of Magical Thinking during Childhood

Faculty Sponsor: Melinda Mull

Major: Psychology  
Hometown: Trenton, Michigan

Previous research on children's magical thinking has shown that around the age of 6-7 years children become skeptical of magic (Phelps & Woolley, 1994). For example, they are less likely to believe in fantasy figures, such as Santa Claus, and use magic less frequently as an explanation for events. It is believed that this shift is due to advancements in cognitive development. That is, children simply know more about how the world works as they get older. This study investigated the relationship between influences such as parenting, peers, and schooling, and the development of magical thinking in young children. A total of 97 participants, parents of children between the ages of 5 and 9 years, participated in this study.

All parents completed a questionnaire that asked about the frequency and contexts in which their child engages in magical thinking. It was expected that context, such as peers or schooling, would influence magical thinking. Results suggested that the less often parents used terms such as magic or trick to explain events to their children, the less children also used these terms. Parents reported that being around peers was more likely to decrease, rather than increase, their child's use of magical thinking. Additionally, parents were more likely to report that entering kindergarten increased, rather than decreased, their child's use of magical thinking. Overall, parents, peers, and schooling seem to influence children's magical thinking. Therefore, changes in children's magical thinking may not be due simply to advancements in cognitive development.

*Supported by: FURSCA*



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**STEPHEN FRITZ II, '05****Unconscious Priming of Mirrored Words: Explorations in Subliminal Perception**

Faculty Sponsor: Tammy Jechura

Major: Psychology  
Hometown: Parma, Michigan

Today, many children and adults are affected by a variety of reading disabilities. One of the most well known, dyslexia, results from a person perceiving a word as though its individual letters were out of order. A



less common disability, known as mirrored reading/writing, involves the ability to read and write mirrored words with better proficiency than normally written words. Past research suggests that these unusual qualities may result from damage to the left parietal lobe, left basal ganglia, and right supplementary motor area of the brain. Lesions to these areas might cause people to rely on less prominent visual-spatial abilities that occur naturally, but rarely appear in the day-to-day life of healthy individuals. In order to determine the innateness of mirrored reading/writing, researchers used a study of unconscious perception in which college students were asked to complete a mirrored word recognition task. These students identified target (mirrored) words after viewing a "subliminal message" that contained a primer word. Of the 72 target words presented, 24 were presented without primers, 24 were presented with primers of normally written words, and 24 words were primed with a mirrored word which was identical to the target word. In addition, delay effects were explored by presenting each target word four times and inserting 30ms, 100ms, 1sec, or 2sec time gaps between the primer and the target words.

*Supported by: FURSCA*

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**SARAH GEBHARDT, '06****The Effect of Attending a Summer Sports Camp on Racial Preferences in Children**

Faculty Sponsor: Barbara Keyes

Major: Psychology  
Hometown: Grand Rapids, Michigan

The current study investigated young children's racial preferences and whether or not those preferences changed during the course of attending a racially diverse summer camp. Participants were 106 children

(grades 1-4) from both racially homogenous and racially diverse schools. Measures were taken during the first week of camp and again during the last week of camp using a CD-ROM game based on a forced choice model. The game presented children with three targets which differed only in skin tone, light, medium, or dark, and children were asked to assign specific characteristics to one of the three targets. Data from the first week revealed a significant interaction between target and grade level. In contrast, data from the last week revealed a significant interaction between target and race. Although in-group preference decreased as a function of grade level during the first week, this finding was not replicated during the last week of camp. Results were explained using cognitive-development theory. The role of the camp as an intervention setting and the limitations of using a forced choice model were also discussed as well as implications for future research.

*Supported by: FURSCA*

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**DAVID GOODYEAR, '07**Major: Biology  
Hometown: Perry, Michigan**DANIEL HARRIS, '06**Major: Biology  
Hometown: Bloomfield Hills, Michigan**Sex Ratios and Sources of DNA in Nestling House Wrens and Tree Swallows**

Faculty Sponsor: E. Dale Kennedy

In birds, sex ratios are determined by sex chromosomes, Z and W. Female birds are ZW while males are ZZ, and it has been suggested that females may be able to control the sex ratios of their offspring. In 2004, we used blood and feathers to examine sex ratios of nestling house wrens (*Troglodytes aedon*) and tree swallows (*Tachycineta bicolor*) at Whitehouse Nature Center (WNC). Both species are cavity-nesters that breed

*Goodyear**Harris*

in artificial nest boxes in WNC, but tree swallows are generally single-brooded, highly synchronous breeders while house wrens are often double-brooded and show less synchronous breeding patterns. Among individual nestlings, sex ratios in swallows did not differ from 1 male: 1 female (0.51 males), although ratios in whole broods were skewed towards males (0.58 males). In early broods of wrens, the ratios of whole broods were slightly male-biased (0.54 males). We also compared concentration and purity of DNA collected from blood and feathers. The blood collected from tree swallows had an average DNA concentration of 34.9 µg/ml and a purity ratio of 1.77 (where 1.8 is completely pure DNA), while the feathers collected had an average DNA concentration of 30.6 µg/ml and a purity ratio of 1.81. In comparison, the blood collected from house wrens had an average DNA concentration of 48.11 µg/ml and a purity ratio of 1.66, and the house wren feathers had

an average DNA concentration of 23.59  $\mu\text{g/ml}$  with a purity ratio of 1.49. Although there appeared to be more variance in DNA collected from feathers, both feathers and blood provided sufficient DNA for sexing nestlings.

Supported by: FURSCA

### BRIANNA GRANLUND, '05

Major: Chemistry  
Hometown: Gaylord, Michigan

### DANA SAUTER, '05

Major: Chemistry  
Hometown: Oswego, Illinois

### Thermodynamic Studies of the *Anabaena* Group I Ribozyme

Faculty Sponsor: Christopher Rohlman

The 249 nucleotide *Anabaena* pre-tRNA<sup>Leu</sup> Group I intron utilizes a minimal structure to catalyze the transesterification reactions required for RNA self-splicing. The *Anabaena* intron has distinct catalytic properties, which include its preference for  $\text{Mg}^{2+}$  as the metal factor in catalysis and a minimal guide sequence. Domain folding can be monitored through their thermal stability via UV/VIS melting curves.



Granlund



Sauter

Analysis of the UV melting curves was used to monitor the folding of the whole domain over a range of conditions to determine their contribution to intron folding. Specifically, sodium concentrations and pH variations were studied to optimize experimental folding conditions. This information will be used to determine the biologically favorable thermodynamic parameters for the *Anabaena* Group I self-splicing pre-tRNA<sup>Leu</sup> intron.

Supported by: FURSCA

### CHRISTOPHER GRAVES, '05

### Tried, Tested, and True: A Survey and Analysis of Improvisation Methods and Techniques in Public School Music Programs in Southern Michigan

Faculty Sponsor: Samuel McIlhagga

Major: Music Education  
Hometown: Troy, Michigan

This project involves data gathered from a survey that was sent out to over 300 high school band directors in southern Michigan in January and February 2005. The survey was designed to discover what



methods of improvisation are being taught in public school music programs, if any, and if these methods meet the state standards of music education. I hope to share with everyone my findings as well as the specifics of the results, including what methods are most common, how directors prepare themselves for the job, and what can be done for those who do not meet the standards.

Besides the survey that was sent out, many extensive interviews and classroom observations helped me to arrive at my conclusions. Not only did I get practical educational experience to broaden my background, I also got a firsthand look at how students are being taught improvisation today. I plan on making these results available to any band director who is looking for a way to build a successful music program involving improvisation, and to stress this area of concentration as a necessary building block in the development of children.

### WILLIAM GREEN, '05

### M Men, a Monkey, and Some Coconuts

Faculty Sponsor: Mark Bollman

Majors: Mathematics, Physics  
Hometown: Downers Grove, Illinois

A classic Diophantine equation is that of three men stranded on an island with a monkey and some number of coconuts. Through a series of equal divisions, each man subsequently takes one third of the pile and leaves one coconut for the monkey. Simple analysis of this problem yields a family of solutions. What will happen if the same pattern of division is applied to four, five, or, more generally,  $M$  men? Solutions will be presented and derived for three and four men as well as a proof showing the answer for any number  $M$ .



### BETH GRUBER, '08

Major: Chemistry  
Hometown: Marquette, Michigan

### SHAUNA PARADINE, '08

Major: Chemistry  
Hometown: Schoolcraft, Michigan

### Progress toward the Synthesis of a New Class of Hypervalent Iodine Reagents

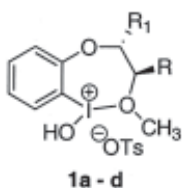
Faculty Sponsor: Andrew French

The synthesis of a new class of hypervalent iodine reagents of type 1 is reported. These ether-containing reagents can be synthesized in three steps, via an epoxide-opening, etherification, and oxidation protocol.



Gruber

Stereochemically pure ether alcohols can be obtained using commercially available chiral epoxides and 2-iodophenol. Our progress to date is reported here, as well as our future plans.



R R<sub>1</sub>  
 Me H  
 Ph H  
 Me Me  
 Ph Ph



Paradine

Supported by: Student Research Partners Program,  
 American Chemical Society Petroleum Research  
 Fund

## ERIC GRUNOW, '05

(See Stephanie Clark, '06, Eric Grunow, '05)

## DANIEL HARRIS, '06

(See David Goodyear, '07, Daniel Harris, '06)

## BRITTANY HARTE, '05

### Factors Predicting Child Custody Recommendations in Cases Involving Parental Substance Abuse

Faculty Sponsor: Melinda Mull

Major: Psychology  
 Hometown: East Lansing, Michigan

A majority of child maltreatment cases involve parental substance abuse (Child Welfare League of America, 1997). Children whose parents abuse alcohol and/or drugs are three times more likely to be abused and four times more likely to be neglected (Kelleher, Chaffin, Hollenberg, & Fischer, 1994). Although the children of substance abusers are at a greater risk of maladaptive developmental, health, and social outcomes than children of parents who do not abuse substances, many judges have not cited parental substance abuse as one of the leading factors in determining child custody arrangements (Wallace & Koerner, 2003). Studies reveal mixed results concerning the degree to which parental



substance abuse contributes to court rulings of custody termination. This study sought to identify factors, including substance abuse, that may predict a court recommendation claiming that custody removal is in the best interests of the child. A sample of 47 custody reports from child abuse and neglect cases was examined from a psychological clinic in a Michigan circuit court. Variables of interest included demographic factors, history of substance abuse, and mental health of parent(s). Results suggested that variables such as employment status of parent and stability of housing were the primary predictors in the custody cases included in the sample. These variables influenced court recommendations more than variables such as substance abuse history and mental history of the parent(s). Developmental implications of court decisions are discussed.

Supported by: FURSCA

## DANIEL HARTNER, '05

### Bilateral Redundancy Gain for Affective Stimuli

Faculty Sponsors: Amy Otto, Michael Anes

Majors: Philosophy, Psychology  
 Hometown: New Baltimore, Michigan

Evidence for hemispheric asymmetry has been widely documented, yet unified cognition, perception, and behavior results from the hemispheric interactions of specialized processing systems for language, visuospatial computation, face recognition, and affective information. Much past research has been committed to the demonstration of hemispheric asymmetries, but a recent trend is toward understanding how the two hemispheres in collaboration can improve performance beyond the ability of either hemisphere working in isolation—a phenomenon called *bihemispheric advantage* (Marks & Hellige, 1999, 2003). Bihemispheric advantage is seen when stimuli (words, or pseudoword letter strings) are presented to the left hemisphere, right hemisphere, or both hemispheres simultaneously (a *redundant* condition).

The present study made use of this bilateral redundant paradigm in conjunction with emotional material in an attempt to



examine the tenability of the valence hypothesis, which states that the right hemisphere is specialized for negative affect and withdrawal behavior, and the left hemisphere is specialized for positive affect and approach behavior (Davidson, 1992). Three- and four-letter pseudowords and emotional words were unilaterally and bilaterally presented to 35 participants, who were to identify component letters of the stimuli. Words were taken from the ANEW database (Affective Norms for English Words—Bradley, Cuthbert & Lang, 1999). Accuracy of bilateral and unilateral trials was then compared to reveal information about the effects of hemispheric collaboration on performance. Results revealed no clear bilateral redundancy gain, and the valence hypothesis was not supported.

Supported by: FURSCA

## BRAD HAUCH, '06

### An Experimental Examination of Responses to Song Complexity of the House Wren (*Troglodytes aedon*)

Faculty Sponsor: E. Dale Kennedy

Major: Biology  
 Hometown: Sawyer, Michigan

A more complex song produced by a male house wren may have an adaptive benefit in securing territory and attracting a mate. One possible explanation is that an individual with greater song complexity may deceive rival males into believing that multiple birds are present. This perception of multiple males may deter rivals from encroaching on the territory of the individual producing the complex song. I carried out a playback experiment to determine whether males would respond more strongly to songs of a greater complexity (labeled "complex" song bouts) than songs of a lesser complexity (labeled "simple" song bouts). I used a software program, SASLab Pro, and recordings of house wrens to create tapes of "complex" and "simple" song bouts. These tapes were then played to individuals in the Whitehouse Nature Center in Albion, Michigan, and I observed and recorded the birds' vocal responses to the playbacks. Each bird was exposed to either a complex or a





simple playback. I measured the birds' proximity to the playback speaker and used SASLab Pro and Microsoft Excel to analyze the lengths and numbers of songs given in responses to playbacks. I found no significant differences in responses to "complex" and "simple" song bouts displayed by the individuals in the field.

Supported by: FURSCA

**LAUREN HENDERSON, '05**

**The Ebonics Debate in the Classroom: A Study of Ebonics, Standard English Proficiency, and Pedagogy**

Faculty Sponsor: Scott Hendrix

Major: English  
Hometown: Troy, Michigan

I have spent a great deal of time observing teachers dealing with the connections between Ebonics and Standard English. During my teaching experience in urban environments, including Pontiac, Albion, and Chicago, I've noticed that some teachers manage to skillfully acknowledge different languages and dialects in the classroom, while others simply shut out any alternative to Standard English. One of my goals in preparing to teach elementary school has been to create a better understanding of urban language. With this knowledge I hope to model my teaching after those who have found ways to help students understand and acknowledge both their home language of Ebonics as well as Standard English.



While studying in Chicago I surveyed six English teachers. These teachers had managed to handle language skillfully in their classrooms. I learned a great deal from our brief discussions of Ebonics and teaching. I continued my research by participating in FURSCA during the summer of 2004. In this time I researched the Oakland Unified School District's Standard English Proficiency Program and studies on the origin and development of African American Vernacular English as well as a variety of contemporary teachers' views on Ebonics in the classroom. Through my research and directed study in this last academic year I have created a detailed pedagogy. I plan to complete a record

of my research and personal findings in an article created for submission to journals dealing with English language and elementary level classrooms.

Supported by: FURSCA

**SAM HOGG, '05**

**Raising the Stakes: MEAP and the Effects of the Michigan Merit Scholarships on Secondary and Postsecondary Education**

Faculty Sponsor: Myron Levine

Major: Political Science  
Hometown: Cadillac, Michigan

This study examines the Michigan Merit Award Scholarship Act of 1999, a statewide merit program that awards scholarships to graduating seniors who have demonstrated achievement at or above Michigan standards. The program is dissected and scrutinized based on achievement of its defined goals, potential biases and reasons for such discrepancies, and the backlash from universities in response to the statewide scholarship. Many studies that examine the merit awards were incorporated into this work. The studies have been somewhat limited by the short life span of this new program, but there still seem to be some obvious trends. In sum, there is no real evidence that the Michigan Merit Award money is playing a large part in the decision to go to college; academic achievement has not significantly increased based on traditional measures; historically under-represented students in higher education continue to be underrepresented; and the ever-increasing price of higher education seems to have been catalyzed to new levels by the implementation of this award.



**HEATHER HOLLEMAN, '05**

**Simulating Hallucinations: An Examination of Cognitive Abilities during Auditory Distraction**

Faculty Sponsor: Barbara Keyes

Major: Psychology  
Hometown: Ortonville, Michigan

Widespread memory deficits are often observed in persons suffering from hallucinations (Levin, Yurgelun-Todd, & Craft, 1989). Although impairments exist in both recall and recognition tasks, recall seems to be most significantly affected (Calev, 1984).



This study was designed to create a human analogue of auditory hallucinations as experienced by persons suffering from schizophrenia. College students (N = 61, 22 male) completed a series of cognitive tasks while experiencing 1 of 3 auditory conditions. Auditory conditions (administered through stereo headphones) included silence, a reading of a physics text, and a simulated auditory hallucination (Deegan, 1996). Cognitive tasks included a free recall task (35 words presented for 2 seconds), a source monitoring task (10 pictures presented for 2 seconds) followed by a word recognition test, and a simple math test (20 equations presented for 3 seconds each). A measure of change in affect was used to assess the reliability of the auditory condition manipulation. This change was calculated by comparing a self-reported measure of affect before and after the presentation of auditory stimuli.

The multivariate effect of condition was significant,  $F(6, 96) = 3.96, p = .001$ . A one-way analysis of variance indicated significant impairment in word recall for participants in the hallucination condition,  $ps < .05$ . Results also revealed impairment in source monitoring for participants in the physics condition as compared to participants in the silence condition,  $F(2, 58), p = .001$ . Accordingly, the emotionally charged content of the auditory hallucination interfered with normal subjects' ability to encode and retrieve words on the free recall task. It is not surprising that the impact of auditory hallucinations is even more pronounced in individuals suffering from schizophrenia due to the combined effects of

cognitive interference and deficits in the ability to accurately monitor reality. Thus, this study offers a model to explain the way in which auditory hallucinations disrupt cognitive functioning.

*Supported by: FURSCA, Psychology Department*

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## KATHLEEN HORNBACHER, '05

### Is Fashion Art? A Discussion of the Aesthetic and Expressional Qualities of Dress

Faculty Sponsor: Bille Wickre

Major: Art and Art History  
Hometown: Royal Oak, Michigan

In the past half century fashion has received a greater attention from the scholarly world and new validity as a topic of discourse. However, this newfound attention has come primarily from discussion focused on the



social, economic, and psychological aspects of the subject. Often neglected is arguably fashion's most important feature, the aesthetic.

I discuss the highly contested relationship of fashion and art holistically, considering the elements of expression and of the aesthetic. I also examine cultural considerations using diverse sources such as Remy G. Sausslin's writing, "From Baudelaire to Christian Dior: The Poetics of Fashion," exhibitions such as the 1987 Fashion Institute of Technology's "Fashion and Surrealism," and artistically inspiring designs such as Paul Poiret's "hobble skirts," Christian Dior's "New Look" and modern-day designer Zac Posen's dresses that are sculptural jigsaws. I examine the similarities and differences between fashion and art that sparked such a potent debate. My past work as an intern for designer Zac Posen in New York and with Belgian designer Patrick Van Ommeslaeghe in Paris also helped me in understanding further the role of designer as artist. I conclude with discussion of my own designs which were born of my experiences with the aforementioned designers, and of my passion for the fine arts.

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## CARRIE HOWLAND, '05

### A New Vision: The Albion Arts Cooperative

Faculty Sponsor: Helena Mesa

Major: English (Creative Writing Emphasis)  
Hometown: Marshall, Michigan

The Albion Arts Cooperative model was formed to establish a space where both college and community may intersect to foster, promote, and learn from the creative process. This is by no means a utopian idea.



There is a great need for a space for both college and community members who appreciate and desire to foster the arts. An artist cooperative brings creative people together to encourage the development and exchange of ideas.

The model includes a downtown location with both gallery and performance space. It also incorporates community programs that establish mentor relationships with students and professional artists. Over time, the cooperative will provide studio space and residential housing for students and professional artists.

This cooperative will meet the needs of artists involved in various artistic endeavors, from writing to visual art to performance. It will foster the needs of the creative process, outside the classroom setting. The cooperative will also provide a venue for artists to showcase their works, including a downtown "Art Market." This market will provide a venue for local artists and college students to sell their art, making art available to members of both communities. It is hoped that this model will act as a catalyst for development and growth, in both the college and the surrounding community.

The Albion Arts Cooperative will provide opportunities for people who appreciate the arts, embrace creative collaboration, wish to share their artistic talents, practice cultural diversity, desire to see development and growth, and respect the artistic endeavors of others.

*Supported by: FURSCA*

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## MICHAEL HUFF, '05

### Brand Management in Sports

Faculty Sponsor: John Bedient

Major: Economics and Management  
Hometown: East Grand Rapids, Michigan

This study focused on the integration of a familiar, successful marketing technique, brand management, into the management and marketing plans of sports teams. Many companies worldwide have



long been concerned with managing their brand so that consumers have a certain, desired response when interacting with that company's products or services. Because of the cyclical nature of sports—teams usually win for a few seasons then experience a "rebuilding phase" during which they lose for a few seasons—sports teams are becoming increasingly concerned with their brands. They hope to manage the fan's experience with the team and the brand and to create a brand that keeps many fans engaged during both good and bad times. This project examines brand management in sports and whether or not a specific team, the Detroit Pistons, has been successful in creating a strong brand that will serve them well in the long run.

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## AMY HUPP, '06

### Environmental and Climatological Effects on Nurse Shark Reproductive Behavior

Faculty Sponsor: Jeffrey Carrier

Major: Biology  
Hometown: Clinton Township, Michigan

Climatological and environmental variables such as water temperature, salinity, amount of dissolved oxygen, tides, currents, and moon phase may be highly influential in determining why nurse sharks



(*Ginglymostoma cirratum*) return to the Florida Keys year after year to mate and reproduce. Data were collected for two weeks during the month of June 2004, during the period when these nurse sharks are known to be reproductively active. Data were collected at five locations within the site. Additional data were also recorded at the specific site of a mating event after a mating event occurred. These preliminary data mark the first steps in investigating and determining the correlation between the environment and the climatological triggering effects of mating in sharks.

*Supported by: FURSCA-Upjohn Fellowship, W.W. Diehl Professorship*

### JAIME HYPES, '06

#### **Wringing, Twisting, and Screaming: Intimate Relations in the Songs of Early Blues Women**

Faculty Sponsor: Leonard Berkey

Major: Anthropology and Sociology  
Hometown: Howe, Indiana

Blues music as a form of racial and gendered expression has often focused on resistance, struggle, and survival in response to the pressures of white American culture. It is a music that reflects the important aspects, issues, and changes in demographics and culture within the United States. Blues music demonstrates the attention given to and efforts to change many important social and political issues within the lives of the songwriters and singers.



In my research, I focus on several aspects of intimate relations within the lyrics of the blues women of the 1920s and 1930s. Intimate relations are at the core of personal experience and understanding, and to no less extent a reflection of cultural and social norms and pressures. There are many themes that could be a focus for such a study; however, for the nature of this research, and my own personal interest, I have chosen to focus on intimate relationships, which I have divided into six sub-categories: sexual behavior, competition, lack of trust, domestic violence, revenge, and escape. Within these categories I have chosen to focus on specific songs that I believe best exemplify the

purpose and intent of the topic. An employment of black feminist theory focused on a personal-as-political approach supplies the analytic framework.

Note: This presentation contains explicit content and may be inappropriate for children under 13.

*Supported by: FURSCA*

### MICHELLE ILITCH, '06

#### **Pharmacy Benefit Managers and Their Impact on the United States Pharmaceutical Industry**

Faculty Sponsor: Myron Levine

Majors: Political Science, History  
Hometown: Livonia, Michigan

One of the most debated items in the past four presidential elections has been the rising cost of health care in America. Extending health benefits to the nation's underprivileged has become the focus for America's policymakers. Currently, pharmaceuticals are the fastest-growing expenditure in health care costs in the United States. Statistics compiled by the Kaiser Family Foundation find that prescription drug spending in 2001 was \$140.6 billion, three times what it was in 1990. In 2002, drug spending increased by 15.3%, in comparison to a 9.5% increase for hospital care and a 7.7% increase in physician services. An effective solution to the cost of pharmaceuticals has been the insertion of Pharmacy Benefit Managers (PBMs) in both the public and private sector.



Implementing a generic mandated system, PBMs educate consumers in order to counter the myth that there is a difference between brand-name and generic drugs. The inclusion of an intermediary such as a Pharmacy Benefit Manager has reduced costs for the nation's largest benefit program, The Federal Employees Health Benefit Plan (FEHBP). This presentation will analyze evidence found by the General Accounting Office study of FEHBP and research compiled from approximately 70 PBMs that currently exercise 80 percent of all prescriptions filled in the United States. Relevant to consumers and health care

providers is an understanding of how the pharmaceutical industry currently operates in the U.S. marketplace.

### KRISTINA JELINEK, '05

#### **Education Matters: Mexican/Mexican-American Migrant Youth in Michigan Secondary and Postsecondary Schools**

Faculty Sponsor: Leonard Berkey

Major: Anthropology and Sociology  
Hometown: Suttons Bay, Michigan

One of the longest standing migrant populations in the United States is the Mexican/Mexican American seasonal farm workers who travel throughout the country following crop-based labor opportunities. This



research addresses matters of educational access and attainment by migrant youth. In the United States, education is seen by many as a primary tool for social advancement. Educational capital serves to improve the current conditions of a social group, increase employment opportunities and financial means, and benefit future generations. The goals of this study are to synthesize current research to develop an understanding of the academic experiences of migrant youth, to explore youth-based identity through the experiences of students, educators, and administrators, to determine patterns of college success, and finally, to examine possible changes in the academic policies that affect this population. Migrant youth face many challenges; they must navigate the world through multiple spheres of analysis, including linguistic differences, familial responsibilities, place of origin, and changing generational expectations. In addition, general themes of youth development such as changing gender roles, peer relationships, and how aspirations affect migrant youth are addressed.

*Supported by: FURSCA*

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**LAURA JORDAN, '05****In Search of Legitimacy: The Case of Buddhist Nuns in Burma**

Faculty Sponsor: Lars Fogelin

Major: Anthropology and Sociology  
Hometown: Flint, Michigan

Although there once was an official lineage of "female monks" [*bhikkhunis*] in Burmese Buddhism, nearly equal to male monks in status, the last Burmese *bhikkhunis* died out over 700 years ago. In the lineage's



absence, women in Burma today who wish to renounce lay-life now become *thilá-shin*. These women follow a similar discipline and lifestyle as their *bhikkhuni* forebears, but do not enjoy the prestige and legitimacy that accompanied *bhikkhuni* ordination. By contrast, the monks' legitimacy remains indisputably intact, and they enjoy supreme religious and social status.

While *thilá-shin* still live highly meaningful and rewarding lives, their lack of full legitimacy burdens their day-to-day lives and long-term spiritual aspirations in very concrete ways (e.g., scarce resources, limited career opportunities). However disadvantaged their situation, I argue that the *thilá-shin* are indeed making modest gains in establishing legitimacy and respect for themselves in the eyes of the Burmese laity.

In the fall of 2005 I carried out ethnographic research among *thilá-shin* in Both Gaya (India) and Sagaing Hills (Burma). Based upon my experience living with the *thilá-shin*, it seems that, rather than voicing objections, *thilá-shin* are working quietly within the existing power structure to negotiate a dignified social space for themselves as legitimate nuns. I will discuss strategies that *thilá-shin* employ on a daily basis to improve their collective status. These strategies include observing a code of discipline stricter than the monks', maintaining harmony with the monks, and cultivating positive relations with the laity.

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**LORI KARAKASHIAN, '05****Fear of Negative Evaluation Affects Helping Behavior**

Faculty Sponsor: Mark Walter

Major: Psychology  
Hometown: Farmington Hills, Michigan

While fear of negative evaluation (FNE) and helping behavior have been studied extensively as individual constructs, there has been little research devoted to understanding the relationship between the two.



Eighty-three participants volunteered for the current study. Prescreening data collected from the students included shyness, fear of negative evaluation, and self-monitoring scores. Participants were randomly assigned to either a social or non-social condition in which an opportunity to help was created. Participants' behavior was recorded on a hidden camera.

Consistent with previous research on the bystander effect (Darley & Latane, 1968), there was a main effect found for condition on helping behavior, indicating more participants helped when they were alone than when in the presence of others. Regression analyses indicated that in the social condition FNE was not a significant predictor of helping. However, in the non-social condition, low FNE was more predictive of helping. Due to diffusion of responsibility, little consideration of helping exists in a social condition. There is no pressure on the individual to act, and therefore no thought about how he or she will be evaluated by others. However, in the non-social condition participants have more responsibility to help. The individuals who experience FNE do not help, while those low in FNE are more likely to help. These results reinforce the finding that the presence of others inhibits helping, and extend this line of research suggesting that even when alone a person who is affected by high levels of FNE may find it more difficult to help.

*Supported by: FURSCA*

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**ROBERT KOCH, '05*****Otaku*: Resistance to the Dominant Paradigm of Identity**

Faculty Sponsor: Molly Mullin

Major: Anthropology and Sociology, Art History, Asian Studies  
Hometown: Clarkston, Michigan

This thesis explores the position of *otaku* in contemporary Japanese society and attempts to situate them as one of the first forms of cultural resistance since World War II. *Otaku* loosely



translates in English as geek or nerd. They are characterized by reclusiveness, obsessive hobbies often based in the consumption of media/related material products, and perhaps most importantly an abandonment of traditional social obligations. To investigate *otaku* I first explore some basic cultural concepts meant to situate the reader in discourse about contemporary Japanese society. From there I discuss Brian McVeigh's research on uniforms and consumption in Japan. By showing how uniforms are integral to the functioning of identity in contemporary Japanese society, I establish a system within which *otaku* do not fit. From that point I discuss who *otaku* are and use the theoretical framework established in earlier sections to situate them as resistant.

*Supported by: FURSCA*

## JACOB KONKOL, '05

### The Abraham Lincoln Brigade

Faculty Sponsor: Geoffrey Cocks

Majors: History, Spanish  
Hometown: Albion, Michigan

In 1936, only three years before the outbreak of World War II, Spain was engulfed in a bloody civil war between the existing government, the Spanish Republic (predominantly far left), and the insurgents (fascist/monarchist). The Spanish Republic asked the world for help, but none responded except the USSR, which sent advisers and weapons. But soon the international communist movement organized, and volunteers began to arrive from all over North America and Europe. They mainly consisted of communists, socialists, and anti-fascists who quickly began numbering in the tens of thousands. Among the foreign volunteers were Americans, who formed into the Abraham Lincoln Brigade. The brigade was considered the first fully integrated military unit of American troops, composed of whites, blacks, Jews, and women. It is estimated that 3,000 men fought throughout the war and over one-third never made it home. To this day, they are often overlooked in history and suffered discrimination as communists when they returned home from their fighting. Yet this was the first group of Americans to stand and fight against fascist aggression in Europe before the U.S. government itself realized the threat.



## MICHAEL KOPEC, '05

### Investigations into Sex-Distortion and Intersexuality in the Intertidal Amphipod *Corophium volutator* (Pallas)

Faculty Sponsor: Dean McCurdy

Major: Biology  
Hometown: Grand Blanc, Michigan

I investigated both microsporidian parasites and intersexes in the amphipod *Corophium volutator*, a key species in intertidal communities that displays highly female-biased sex ratios.



Microsporidia are obligate intracellular parasites that are known to distort sex ratios in other amphipods. A novel microsporidian species infecting *C. volutator* was described only recently, and this parasite may provide an additional explanation for female biases in *C. volutator* populations. I worked toward detecting this novel parasite using a number of different DNA extraction techniques and evaluated the relative efficacy of each method for use at Albion College. Further investigation into these methods may prove useful in future studies of microsporidian infections in these amphipods.

I also investigated the functional significance and behavior of intersexual *C. volutator*, which possess physical characteristics of both males and females. Because females housed experimentally with intersexes produced broods of offspring, the two types of intersexes that I identified functioned as males. I found little evidence to suggest that intersexes also function as females. However, females that mated with one intersex type produced smaller broods than those that mated with the other intersex type or males, suggesting that some intersex types may experience reproductive costs. I also found that intersexes behave similarly to males by investing heavily in crawling activity, although intersexes crawled at a smaller size than males. Microsporidia and intersexes may have significant consequences for *C. volutator* populations, for both could potentially affect operational sex ratios in these amphipods.

Supported by: FURSCA

## LAURA KRASEAN, '05

### The Effect of Stress Management vs. Standard of Care Therapy in Subacute Back Pain Patients

Faculty Sponsor: Barbara Keyes

Major: Psychology  
Hometown: Kalamazoo, Michigan

Past research shows that back pain (BP) is a highly common neurological disorder: estimates indicate that 70-80% of Americans will experience BP at some point during their lives. At any given point in time, 31 million



Americans are affected by BP, resulting in both economic and social costs. A 1998 study estimated that in the U.S., upwards of \$50 billion a year is spent on "back pain-related medical care" (Deyo, 1998). Back pain also disrupts virtually all aspects of daily life, including professional, personal, and social activities. Coping measures carried out by individuals (e.g., exercise, heat, and anti-inflammatory drugs) and coping measures requiring professional help (e.g., physical therapy and surgery) are not always successful in alleviating BP. As a result, numerous innovative treatment methods are currently being pursued.

The present study was designed to explore the relationship between psychological distress and the role that it may play in affecting BP recovery. Study participants were drawn from a spine clinic in the Midwest. All were currently experiencing subacute low back pain (>4 weeks and < 6 months in duration). Study patients (N=4) received one hour of stress management group therapy per week for eight consecutive weeks, along with the prescribed physical therapy. Control patients (N=4) received only prescribed physical therapy. It was hypothesized that in comparison to control patients, group therapy patients would report a decrease in low BP, recover more quickly, and report increased functioning in activities of daily living.

To assess these factors, participants completed six questionnaires/week for nine consecutive weeks. These included the Quebec Back Pain Disability Scale (Kopec et al., 1996), the Beck Depressive Inventory, the Dallas Pain Questionnaire (Lawlis et al., 1989), the Job Satisfaction Survey (Spector, 1985), the Short Form (SF)-36 Health Survey (Reeser et al.,

2001), and the Fear-Avoidance Beliefs Questionnaire (Waddell et al., 1993). Study results and implications for future treatments will be discussed.

*Supported by: FURSCA-Metalonis Fellowship*

## RACHEL LAMPHERE, '06

### “Voi, Che Sapete” from Mozart’s *Le Nozze di Figaro*

Faculty Sponsors: James Ball, Maureen Balke, Shelby Williams

Major: Music Performance  
Hometown: Cadillac, Michigan

“Voi, che sapete” is an aria from W.A. Mozart’s *Le Nozze di Figaro*, an opera that tells the tale of love, betrayal, and forgiveness. In the opera, Cherubino, the character whom I portray in “Voi, che sapete,” is a young teenage boy



full of raging hormones. Cherubino is a page for the Count Almaviva and his wife, the Countess Rosina, who is the object of young Cherubino’s desire. In the second act of *Le Nozze di Figaro*, Cherubino is urged by his friend Susanna (who also happens to be the Countess Rosina’s maid) to sing a love song that Cherubino had written for the countess. Although he had not planned on sharing the song with the countess, Cherubino agrees to sing it, but is nervous about how the countess might react. With both the countess and Susanna in attendance, Cherubino sings “Voi, che sapete.” The aria outlines some of Cherubino’s baffling feelings of love. “Voi, che sapete che cosa è amor, donne, vedete, s’io l’ho nel cor... è per me nuovo, capir nol so. Sento un affetto pien di desir, ch’ora è diletto, ch’ora è martir...” (“You ladies, who know what love is, see if I have it in my heart... It’s new for me; I can’t understand it. I feel an emotion full of desire which is now pleasure, now torture...”). Conveying what Cherubino was feeling for the countess is one of the most challenging and rewarding aspects of this aria. Other aspects that have proven to be of equal difficulty have been vocal technique and the overall dynamic of the piece. I will be performing this aria in the Concerto Concert on April 24 accompanied by the Albion College Symphony Orchestra.

## EDWARD LINDOW, '05

### First Impressions and Affective Reactions as Functions of Type of Economic Success

Faculty Sponsor: Andrew Christopher

Major: Psychology  
Hometown: Canton, Michigan

When people form first impressions of others, these impressions are influenced by the socioeconomic status of the target person (e.g., Christopher & Schlenker, 2000) and by how socioeconomic status was attained (Christopher et al., 2005). This study assessed how the method of acquiring affluence influences both the affective reactions to and the impressions formed of others on specific components of one’s penchant to be open to experience and conscientiousness.



A total of 382 people read a scenario describing a person who attained affluence via one of four methods: entrepreneurial success, promotions at work, inheritance, or successful gambling. In addition, a fifth group of participants read a scenario that contained no information about how the person became affluent. After reading one scenario, participants recorded their affective reactions to and impressions of the person.

Regarding affective reactions, people resented the character who inherited money and felt more pleasure for the entrepreneur and those who earned promotions at work. Regarding openness to experience, the entrepreneur was perceived as particularly inventive, insightful, and unconventional. The person who earned promotions at work was perceived as lacking spontaneity. Finally, the gambler was perceived as particularly spontaneous, action-oriented, and unconventional. Regarding conscientiousness, the entrepreneur was perceived as particularly dutiful.

In sum, how affluence is acquired influences both people’s affective reactions to others and judgments of others on specific facets of broad personality traits. This conclusion suggests that examining only broad

personality factors may obscure important, specific characterizations that provide a more accurate portrait of impressions.

## DANIELLE LORD, '08

### Geochemistry of Absaroka Volcanic Rocks from the Heart Mountain Fault Zone, Park County, Wyoming

Faculty Sponsors: Beth Lincoln, Timothy Lincoln

Major: Geology  
Hometown: Indianapolis, Indiana

My studies address the relationship of the Absaroka volcanics to the Heart Mountain Fault (HMF) in Wyoming. I tested two hypotheses for the fault. William Pierce’s model is that the faulting preceded most



volcanics and the fault blocks were later covered by volcanics. Tom Hague’s model suggests a gravitational collapse, in which faults were caused by the weight of volcanic rocks forcing the volcanic pile and underlying rocks to spread out laterally. A key difference between their models is the way in which volcanics came to rest on and near the HMF surface. In Pierce’s model, they are deposited there. In Hague’s they are faulted into place. In this study I analyzed volcanic rocks from two locations, about 1 km apart, each near the HMF surface. Similar compositions between the suites would support Pierce’s model and different compositions would support, but not prove, Hague’s. I analyzed about 20 rocks from site 1 and about 25 from site 2. Major and trace element abundances were determined using x-ray fluorescence; mineralogy was determined with x-ray diffraction and optical petrography. The rock suites are different. Rocks from site 1 are trachyandesites (Alkalies-Silica Cox-Bell-Pank diagram); the rocks from site 2 are dacites. The silica content is higher in the rocks from site 2. Quartz is present in some of these, but absent from all of the site 1 samples. Amphibole is the most common mafic mineral in site 2; pyroxene is most common in the site 1 suite. My results support the Hague model, but further research from the surrounding area is needed.

*Supported by: FURSCA, National Science Foundation, Department of Geological Sciences*

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## JESSICA MACKOWICK, '05

### Let Them Eat Cake: Homeless Shelters and the Cycle of Poverty

Faculty Sponsor: Molly Mullin

Major: Anthropology and Sociology  
Hometown: Warrenville, Illinois

For many of us, the only homeless people we ever see are those perched on doorsteps with outstretched hands holding dirty cups of change, sleeping in alcoves and rifling through trash bins by day.



But there is another side to homelessness of which many of us are only vaguely aware. We know that there is a shelter system in place to help these people get off the street and back into the world as respectable members of society. We know there are places one can go to find a warm bed, a hot meal, and a safe haven. Maybe our churches sponsor food drives, or maybe we have donated clothing to the Salvation Army, or maybe we have even been in shelters like these ourselves. Mustn't people be crazy, then, to live in the street when shelters are everywhere, just waiting to help them?

From the outside, homeless shelters do seem to help people. They often provide food, shelter, clothing, laundering and showering facilities, and job training or education programs, all free of cost. However, a closer look reveals that, in many ways, the shelter system works inefficiently and inconsistently, actually perpetuating the cycle of poverty that it is meant to end. During 16 weeks of intensive study, I gathered stories from the residents and volunteers of a nearby homeless shelter. I spent time helping out and observing life there, and was surprised at what I found—that homeless shelters can actually hinder homeless people's progress towards a better future.

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## ERIC MACKRES, '05

(See Lacey Doucet, '05, Eric Mackres, '05)

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## COREY MADURA, '05

### Individual Differences in Perceptions of Race and Sexual Orientation: An Experimental Investigation

Faculty Sponsor: Mark Walter

Major: Psychology  
Hometown: Grand Rapids, Michigan

Recent research in predicting prejudice has focused on the big-five personality characteristics (openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism) of prejudiced individuals. This study assesses how people differing in these five traits would perceive others varying in race and sexual orientation along these same five dimensions. The influence of racism and homonegativity was also examined.



Participants (N = 64) completed the Modern Racism Scale (MRS; McConahay, Hardee, & Batts, 1981), a homonegativity scale (HNS; Morrison & Morrison, 2002), and a measure of the big-five personality characteristics (NEO-FFI self-rating). Participants were presented with a wedding announcement and a photo depicting a couple varying in one of four race by sexual orientation conditions. The NEO-FFI was then completed in regards to the target couple.

Results indicated that people do perceive others as differing in personality characteristics based solely on their race or sexual orientation. Participants saw the homosexual target as more neurotic and more open to experience than heterosexuals. In addition, it was found that people's own personality traits influence their perception of personality traits in others. Self-ratings of conscientiousness interacted with the sexual orientation of targets such that those high in conscientiousness saw homosexuals as more conscientious than heterosexuals. Those low in conscientiousness did not distinguish between homosexuals and heterosexuals.

This research extends previous findings by showing that perceptions of the big-five personality variables differ as a function of race and sexual orientation of targets. Following

previous research, openness to experience stands out as an important personality variable.

*Supported by: FURSCA*

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## KAROLINA MALUGA, '05

### Influence of School System on Albion's African American Youth and Their Perceptions of Success

Faculty Sponsor: Diana Ariza

Major: International Studies  
Hometown: Krasnystaw, Poland

In a community such as Albion very often youths find that their future is prescribed before they have any influence on it. In my research, I learned from the high school youths themselves about their definition of success and how the school system has helped or hindered them in achieving their goals. I also discuss their take on governmental laws such as the No Child Left Behind Act and the influence of their families and peers. Working within a theoretical framework including fictive kinship, family, and peer influence, and considering social pressures of the everyday world, I explore African American youths' opinions on success in their community and through the school system.



*Supported by: FURSCA, NCUR/Lancy Initiative*

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**KAPIL MANDREKAR, '07****Breeding Habitat of Secondary Cavity-Nesting Birds**

Faculty Sponsor: Douglas White

Major: Biology

Hometown: Kalamazoo, Michigan

Birds are under strong selective pressure to recognize and select nest sites that provide the physical, structural, and biological characteristics necessary for successful reproduction. In a study at



the Whitehouse Nature Center at Albion College, I sought to identify what habitat components best explain why certain secondary cavity-nesting birds choose particular breeding sites. To avoid confounding effects arising from variations in cavities created naturally by primary nesters such as woodpeckers, I deployed 45 identical nest boxes across a range of habitats in two old fields in spring 2004. Box sites varied from woodland margin to open field. Based on regular monitoring, boxes were used successfully by house wrens (*Troglodytes aedon*), tree swallows (*Tachycineta bicolor*), and southern flying squirrels (*Glaucomys volans*) in decreasing order. Breeding attempts by black-capped chickadees (*Poecile atricapillus*) and some swallows failed because of attacks by house wrens. Flying squirrels killed some wrens and usurped their boxes. To characterize habitat in the immediate vicinity of each box, I measured 116 values reflecting over 20 aspects of vegetation structure at ground, shrub, and canopy levels. Tree swallows, which are aerial insectivores, were hypothesized to prefer the most open box sites. House wrens, which glean insects from woody vegetation and must guard against nest destruction by other wrens, were expected to favor mixed or edge habitats. I present a multivariate statistical analysis to show which aspects of habitat were most important to each species of cavity user.

*Supported by: FURSCA*

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**SHANNON MCGUIRE, '05****Development of a Relational Aggression Questionnaire: Middle School Children's Goals and Strategies as a Function of Friendship Level**

Faculty Sponsor: Jamie Walter

Major: Psychology

Hometown: Deerfield, Illinois

Studies have established that there are negative social and emotional consequences to the use of relational and overt aggression. Researchers are beginning to explore how children think

about and react to overt aggression, but few have examined children's thoughts about relational aggression.



The present study was designed to develop a measure of middle school children's reactions to relational aggression. This measure was then tested for validity by comparing it to measures of loneliness and overt aggression. In the first part of this study, the researcher conducted semi-structured interviews with 10 middle school children (boys and girls), assessing typical relational aggression situations that they encounter, and how they might respond to this aggression. The responses from 10 interviews with seventh- and eighth-graders were used to create an instrument measuring relational aggression utilizing hypothetical vignettes and various goals and strategies for dealing with aggression. In the second part of the study, 50 seventh-graders completed the relational aggression measure along with a similar measure examining responses to overt aggression, and a loneliness scale. These measures were administered to examine the construct validity of the relational aggression questionnaire (RAQ).

Results revealed that the RAQ has high internal consistency reliability, and is correlated with overt aggression. Responses also differed based on friendship level; more prosocial responses were found with friends than nonfriends for both relational and overt aggression. Gender differences in overt and relational aggression will also be discussed. The

results support previous research and validate the use of this new measure of relational aggression.

*Supported by: FURSCA*

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**NATALIE MCKINNEY, '06****Metal Fractionation Processes and Changes in Particle Size Distribution Caused by Household Cleaning Techniques**

Faculty Sponsor: Craig Bieler

Major: Chemistry

Hometown: North Adams, Michigan

The day-to-day traffic of people and pets walking in and out of a home leads to the deposition of soil on hard floor surfaces, such as tile. Soil particles that are deposited on a floor range in size and consequently composition. Monitoring the concentrations of certain metals, such as lead, in dirt on floor surfaces is important due to its health-related applications.

In this study, it was hypothesized that the mechanics of cleaning would cause measurable changes in metal concentrations of the soil deposited on a floor surface through a process called metal fractionation. A standard protocol was used to obtain wipe samples from floors. The floors used in the experiments were prepared by loading them with a standard soil and performing various cleaning techniques. Analysis of the floor wipes was performed using inductively-coupled plasma atomic emission spectroscopy. In addition, individual particle analysis using a scanning electron microscope was performed to provide further examination of the metal fractionation process. Results showed that cleaning affected not only the particle size distribution of the dirt, but also the metal concentrations present on the floor.

*Supported by: National Science Foundation Research Experience for Undergraduates. This research was conducted at SUNY College of Environmental Science and Forestry under the guidance of David Johnson (Chemistry Department).*



## MICHAEL MILLER, '05

### Skin and Hair Development: Examining the Role of Tg737, Kif3a, and the Primary Cilium

Faculty Sponsor: Luti Erbe•nik

Major: Biology  
Hometown: Rochester Hills, Michigan

The primary cilium is an organelle that is found singly on the surface of most vertebrate cell types. The primary cilium functions as a cellular antenna, receiving both mechanical and chemical signals from neighboring cells. This organelle plays a critical role in the development and function of many mammalian organ systems, as exemplified by mutations in Tg737 and Kif3a, two genes needed to build the primary cilium. Previous work has shown that mutations in the Tg737 and Kif3a genes alter the Sonic hedgehog (Shh) and Wnt signaling pathways, which are vital to the development of many organ systems, including the skin and hair follicles. Here mice with a hypomorphic mutation in Tg737 or a conditional mutation in Kif3a were utilized to examine the roles of these two genes in skin and hair follicle development. Specifically, quantitative real-time PCR (QRT-PCR) was used to examine the expression profiles of Shh and Wnt pathway genes in the skin of the mutant mice. Three different genes (Gli1, Gli3, and either Patched or Shh) were down-regulated, demonstrating altered Shh signaling. In the Wnt pathway, two genes (B-catenin and Lef1) were down-regulated in at least one mutant. Taken together, these results demonstrate that the Shh and Wnt pathways are altered in the skin of Tg737 and Kif3a mutant mice. Ultimately, the goal of this study is to determine the function of primary cilia in skin and hair follicle development, as well as the mechanisms involved in basal cell carcinoma (BCC) of the skin, the most common form of human cancer.



*Supported by: Science Undergraduate Laboratory Internship, U.S. Department of Energy. This research was conducted at Oak Ridge National Laboratory.*

## KATHERINE NIESEN, '05

### Individual Temporal Variation in Songs of the Male House Wren (*Troglodytes aedon*)

Faculty Sponsor: E. Dale Kennedy

Major: Biology  
Hometown: Lapeer, Michigan

In organisms that learn their vocalizations, such as songbirds, there is often variation in specific types or arrangements of notes. Male house wrens sing complex songs made up of two parts: a relatively low-amplitude introduction and a relatively high-amplitude terminal section. The terminal section consists of repeated syllables, or trills. Previous research has found a large amount of variation in overall song pattern of male house wrens due to numerous notes and trill combinations. I examined approximately 5,000 songs of three individual male house wrens recorded over two, three, or five sequential days in July 2003 in Whitehouse Nature Center at Albion College to examine variation in the duration of song parts. Each day, a bird was recorded for his first hour of song, and one male was recorded at two additional times during his final day of recording. Avisoft SASLab Pro, a program that visually transcribes songs by frequency, was used to quantify lengths of song parts. Song parts generally varied significantly between days for individual males. Introductions varied more in length than did terminal sections (mean coefficient of variation 31% vs. 22%, respectively). Variation in total song length was less (C.V.=16%) because differences in lengths of song parts were somewhat offsetting. Little constancy existed within an individual's songs throughout consecutive days or within a day, indicating that there is a great deal of unexplained variation within the song repertoires of male house wrens.



*Supported by: Student Research Partners Program*

## MARIÁN NOVAK, '05

### Isolation of the Xylose Regulator in *Thermoanaerobacter ethanolicus*

Faculty Sponsor: Luti Erbe•nik

Major: Biology, German  
Hometown: Banská Štiavnica, Slovakia

*Thermoanaerobacter ethanolicus* is a thermophilic, anaerobic bacterium that possesses enzymatic capacity to use xylose, a major component of plant material, as an energy source. Thermophilic anaerobic bacteria



have become the focus of extensive study due to their potential as bioconverters of agricultural and industrial plant waste into vendable products such as ethanol. This method of fuel production represents a sustainable alternative to exploitation of fossil fuels. However, one must understand the biochemical and genetic principles underlying the processes of bioconversion before employing the microbe in industrial production. Our study focuses on identification of putative xylose regulator (XylR), a trans-acting protein, which regulates expression of xylose utilization genes. We developed a pull-down chromatography method relying on affinity of the XylR for particular DNA sequences. Recently, we managed to isolate protein fractions that fall into our prospect of a possible regulator. Our current focus is isolation of more of the protein in order to obtain a partial amino acid sequence. Knowledge of the sequence will ultimately allow us to identify the protein and thus determine the mechanism it uses to regulate the DNA expression.

*Supported by: FURSCA*

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**BENJAMIN OLBRICHT, '05****Friedrich Olbricht: A Leader of the July 20 Plot against Hitler**

Faculty Sponsor: Geoffrey Cocks

Majors: Chemistry, German  
Hometown: Derry, New Hampshire

Friedrich Olbricht, an officer in Germany's *Reichswehr* starting in 1914, was a leader in the July 20, 1944 plot to kill Adolf Hitler, for which Olbricht was executed in 1944. Recently, his role in the plot has been reevaluated, based on the argument that his preparations from his office in the OKH in Berlin had a more crucial role in the development and furthering of the failed *coup d'etat* than once believed. Without his work in mind, it is impossible to understand the full range and depth of the resistance against the Third Reich.



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**BENJAMIN OLBRICHT, '05****Direct Measurement of the Lifetime of the  $\text{NeBr}_2$  van der Waals Molecule as a Function of Isotopic Species**

Faculty Sponsor: Craig Bieler

Majors: Chemistry, German  
Hometown: Derry, New Hampshire

Two-color pump-probe laser techniques were employed to measure the lifetime of the  $\text{NeBr}_2$  van der Waals molecule in the **B** electronic state as a function of the bromine isotopic species. Clusters were excited with isotopic selectivity into the  $\nu=16$  vibrational state of the **B** state, and the dissociation product  $\text{Br}_2$  was monitored as a function of time by a second laser. Multiple measurements on each isotopic species provide sufficient data to show that the lifetime of the cluster in this vibrational state does not vary significantly as a function of isotope.

Supported by: FURSCA, National Science Foundation

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**STEPHANIE OOSTERHOUSE, '05****The Use of French Comics as a Complement to a French Language Curriculum**

Faculty Sponsor: Dianne Guenin-Lelle

Major: French  
Hometown: Holland, Michigan

I spent the summer of 2004 researching and analyzing the role that various comic series could play in a foreign language program. Comics are a rich source of vocabulary, context-based dialogue, and visualized language forms. They can introduce historical and cultural themes, increase reading levels and interest, and they are versatile between textbook and theme-based curricula. As part of my off-campus semester in France, I researched comics ranging from the classic *Astérix et Obélix* to the more modern *Les Gosses* and *Basile Bonjour*. I chose to focus my research on these comics because of their inherent appeal and appropriateness to a school-age audience. I was reminded of how comic books enhanced my own learning and interest in French when I was in high school. As a future French teacher, I want to offer students a stimulating learning environment.

In addition to researching the role comics can play in language development, I explored how comics prove useful in teaching culture in a foreign language class. Comics portray socio-cultural values and traditions that are important for students to learn, since one cannot completely master a foreign language without also understanding about the culture. Using Bennett's Model of Intercultural Sensitivity, I studied how comics help advance the development and learning of culture in a foreign language class. I also concluded that, even though foreign language comics in such a classroom have much potential, they also have limitations and should not replace traditional materials; rather, they should complement a well-established language curriculum.

Supported by: FURSCA



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**LIGIA PAINA, '05****In Transition: The Post-Communist Evolution of the Romanian Health Care System**

Faculty Sponsors: Gregory Saltzman, Amy Terstriep

Major: International Studies  
Hometown: Dearborn Heights, Michigan

As one of several Eastern European countries to proclaim an end to communist policies in 1989, Romania remains one of the few to continue experiencing grave issues within its health care system. When Romania signs the Accession to the European Union (EU) Treaty this April, it will send an international message of respect for EU ideals of equality, transparency, and solidarity. However, regardless of the façade that Romania conveys to the rest of the world through multiple legislative reforms, the condition of its health care system continues to draw attention to severe shortcomings in their implementation.

During the summer of 2004, I conducted interviews with 20 Romanian doctors and health professionals in a study that traces the evolution of the health care system after the 1989 fall of communism. These participants not only portrayed Romanian health care from an insider's perspective, but they also revealed the true condition of the "reformed" system. While examining the 15-year transition period from a centralized Shemasko health care model to a Romanian version of Bismarck's social insurance model, I considered topics including medical education, changes in patient mentality, corruption, and the effects of Romania's accession to the European Union.

Overall, this study seeks to uncover the deficiencies of Romania's health care reforms while highlighting the process of transition as a case for future health policy analysis. The evidence gathered also shows that in order to ensure uniformity in the support and implementation of reform, particularly in health care, the impetus must come from within the respective society rather than from outside forces.

Supported by: FURSCA



**JENNIFER PAINE, '05**

**The Homeric Question, Unanswered**

Faculty Sponsor: Charles Crupi

Major: English  
Hometown: Bay City, Michigan

The purpose of this thesis is to examine The Homeric Question: the composition of the *Iliad* and the *Odyssey*, their authorship, and the nature of authorship; the reception of the *Iliad* and the *Odyssey* in oral



performance, prose, and verse; the audiences of the *Iliad* and the *Odyssey* over time; the nature of oral poetry; the evolution of the *Iliad* and the *Odyssey* over time; and the dominant myths regarding a poet named Homer. The controlling idea of this thesis is that we can learn a lot—about Homer, the *Iliad* and the *Odyssey*, audiences, evolution of texts over time, ourselves as readers, oral poetry, and poetry in general—without having to answer a single question. We aim to think, think, think about the problems instead and see where all that thinking takes us.

The thesis itself is divided into three parts. Part One introduces Homeric Questions and lays the foundation for the type of archaeological reading (reading of the texts in companion with secondary, scholarly resources) we seek to do. Part Two explores components of The Homeric Question by first discussing Milman Parry's dissertation on oral poetry and Homeric formulas and then teasing out in subsequent sections the questions that emerge from it. Part Three explores topics in The Homeric Question unrelated to Milman Parry, including extreme (and often humorous) re-readings of Homer and the authorship of the epics, recurrent themes in Homer, and modern allusions to Homer.

The hope is that the thesis will allow the reader to progress from learning how to think about Homer, to thinking about Homer, and, finally, to laughing with lighthearted thinking about and (especially) enjoyment of Homer.

**SHAUNA PARADINE, '08**

(See Beth Gruber, '08, Shauna Paradine, '08)

**LAURA PARKER, '05**

**Women in World War II Propaganda**

Faculty Sponsor: Bille Wickre

Major: Art History  
Hometown: Livonia, Michigan

Women in World War II propaganda were shown as taking on new challenges never before allowed to women, but at the same time maintaining traditional gender roles. These ideas were spread



through the use of posters, which were widely distributed where women could easily view them. The government and the many organizations responsible for the artwork organized the creation and production of these pieces. The posters were put in places that women would frequent so that the ideas behind the work were accessible to as many civilians as possible. Average women could see the role models on the posters taking on the new responsibilities that were necessary during wartime. There were posters of women war workers who were able to gain self-respect by joining the different military branches or taking a factory job. A large portion of posters was dedicated to conservation and rationing of food products, which applied to all women who were in charge of the household. Propaganda encouraged women to take on more responsibility for the good of the country even if it meant sacrificing their own ideas about how their household should run.

**KELLY PARSELL, '07**

Majors: Psychology, Art  
Hometown: Indian Head Park, Illinois

**JORDAN TROISI, '06**

Majors: Psychology, English  
Hometown: Holt, Michigan

**Relationships among Perceived Stress, Safety and Social Health Behaviors, and Openness to Experience**

Faculty Sponsor: Todd Lucas

Openness to experience is characterized by willingness to try new things and the ability to accept new things and people different from oneself. In the present research, we examined the importance of openness to experience to physical and mental health. Specifically, we hypothesized that openness to experience may affect health through its relationship to both stress and health behavior. We



Parsell



Troisi

defined stress as negative emotions derived from events that can be perceived as harmful or threatening (Dougall & Baum, 2001), and health behaviors as behaviors undertaken to enhance or maintain health (Nutmean, 1991). Students in introductory psychology courses at Albion College completed an original measure of openness to experience, as well as measures of perceived stress, objective health, and health behavior. Results suggested that individuals with higher levels of openness to experience had lower levels of perceived stress and practiced more safety and social health behaviors. The research suggests how personality may be important to health, and how specific characteristics may benefit one's health over others.

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**LINDSEY PASKVAN, '05****Identity Formation in a Competitive Artistic Environment: Reflections of Midwestern Performing Arts Boarding School Alumni**

Faculty Sponsor: Leonard Berkey

Majors: Psychology, Anthropology and Sociology

Hometown: Flint, Michigan

Much of an adolescent's identity is based upon the intersection of his/her social group, romantic relationships, scholastic achievements, extracurricular activities, and familial background (Erikson, 1968;



Piaget, 1969). Each of these social outlets serves as a mechanism to induce social interaction, and it is through interaction that social roles and rules are created and reinforced. Social interaction is a "performance," shaped by environment and audiences, constructed to provide others with "impressions" that are consonant with the desired goals of the actor (Goffman, 1963). The purpose of this study is to explore the impact of a competitive arts boarding school (the Academy) on alumni identity development. Alumni (N = 52) who graduated during the years 1970-2004 completed questionnaires that measured the perceptions that they had of the Academy's social, academic, and artistic climate. From this sample, a subset (N = 32) participated in phone interviews that focused on their personal experiences at the Academy. In line with the research of Csikszentmihalyi, Rathunde, and Whalen (1993) and the theoretical framework of Bourdieu, the current study found that cultural and social capital foster talent development and directly affect one's sense of self. Also, buttressing the social theory of Giddens (1984), the current study found that political climate dramatically shapes the patterns of beliefs and practices of Academy staff and students. Finally, the overall results have implications for educators wishing to foster talent, and an overall statement on the effect the situation has on identity.

*Supported by: FURSCA*

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**DAVID PIERCE, '05****Ethical and Epistemic Norms of Journalism: An Analysis**

Faculty Sponsor: Bindu Madhok

Major: Philosophy

Hometown: Clarkston, Michigan

There has always been considerable controversy both with regard to the ethical practices of journalists and the information they provide. Journalistic theorists have identified general action-guiding norms such as the market and social responsibility. Although these influences are not being minimized, in this thesis I choose to take a close look at some of the important ethical and epistemic norms underlying journalism.



In journalistic practice, one finds that ethical questions naturally lead to epistemic questions, and vice versa. For instance, whether a reporter ought to (ethically speaking) reveal her sources can be understood as a question about whether her unidentified sources are more reliable (epistemically speaking) than those identified. Conversely, whether an audience is epistemically justified in believing what a journalist says rests, at least in part, on whether she has met certain ethical obligations.

Additionally, understanding which particular obligations apply to journalism is distinct from the issue of where these obligations come from, or what makes for a comprehensive list of obligations. By discussing these and other related issues, I hope to develop a more complete picture of the normative bases of journalism.

*Supported by: FURSCA*

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**JENNIFER POOLE, '05****Words, Writing, and Emotion: The Role of Language and People in the Lives of Children**

Faculty Sponsor: Scott Hendrix

Major: English, Secondary Education Certification

Hometown: Wixom, Michigan

During the summer of 2004, with funding from FURSCA, I spent seven weeks conducting independent research at the NYSP (National Youth Sports Program) camp held on campus



each summer for local, underprivileged children ages 9-16. A total of eight of the campers were interviewed, all of whom are diverse in their ages, hometown, and individual background. What emerged from those interviews covered a wide expanse of topics, several of which became obvious as common themes of interest for interviewees. The written documentation of those interviews has evolved into a thesis, which contains four main chapters. In the first chapter, the focus is on their social lives, regarding friends, enemies, and especially peer harassment. The second chapter discusses family, what makes a good family, role models, and the concept of goal-setting, which, for nearly all of the interviewees, related directly to family. The next chapter considers the theme of creative writing, specifically how emotions influence expression and the types of inspiration that a child uses to write. Finally, the last chapter is the over-arching theme of how teachers can take all of the previous information into account in the classroom to help develop well-rounded, successful students.

*Supported by: FURSCA*

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## JESS POSSEHN, '05

### Innovations in Injury Rehabilitation Relative to Shoulder Joint Biomechanics: A Case Study

Faculty Sponsor: Robert Moss

Major: Athletic Training  
Hometown: Lake Odessa, Michigan

The mission of the National Athletic Trainers' Association states that athletic trainers work primarily to enhance the quality of health care for athletes and those engaged in physical activity, and to advance the



profession of athletic training through education and research in the prevention, evaluation, management, and rehabilitation of injuries. This case study focuses on the rehabilitation protocol for a specific shoulder injury, an anterior dislocation of the glenohumeral joint.

The purpose of this case study was to analyze how using an innovative immobilization technique of the shoulder relative to the specific joint biomechanics of the shoulder may decrease the time of rehabilitation and enhance the accomplishment of the aforementioned goals of rehabilitation. Research has shown that immobilization of the arm in 35° of external rotation does a better job of approximating the joint capsule to the glenoid neck than when the arm is immobilized in internal rotation, the traditional method of immobilization. It appears that appropriate approximation of the joint capsule allows for better healing at a quicker rate of the capsule and the structures surrounding the anterior shoulder capsule. Optimizing the environment for healing decreases healing time and allows the primary parameters of rehabilitation (range of motion, strength, and proprioceptive exercises) to begin sooner which allows the individual to return to his/her chosen activity sooner as well.

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## KEN POWELL, '05

### Love, Sex, and Desire: The Role of Sadomasochistic Sexual Practices in Reinterpreting Romantic Narratives

Faculty Sponsor: Leonard Berkey

Majors: Anthropology and Sociology, Gender Studies  
Hometown: Midland, Michigan

This study focuses on the way that those who participate in sadomasochistic sexual practices might have a different 'read' of the romantic narrative, or the ways that people describe their romantic relationships in the context of culturally provided descriptions. Of particular interest is whether sadomasochistic sexual practices are functional in overcoming issues of intimacy and eroticism in the romantic narrative. A second focus is how the occupation of a 'deviant' sexual identity interacts with the construction of this relational narrative.

Fifteen participants were interviewed: 10 in the midwestern United States and five in a metropolitan area in Germany using semi-structured interviews lasting approximately one to two hours. The interviews were then transcribed and analyzed as text through the lens of queer theory and social constructionist views of sexuality. This text was recognized as socio-politically embedded in both the personal and collective group positioning within the dominant social structure.

The importance of looking at sexuality through the paradigm of queer theory in sociological investigations has been noted by many researchers and theorists; this study also can contribute to this discussion through the investigation of the socially situated construction of sexuality and sexual identities.

Note: This presentation contains explicit content and may be inappropriate for children under 13.

*Supported by: FURSCA, Anthropology and Sociology Department*



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## JAYNE PTOLEMY, '06

### "It Ain't My Shame": Social Constructions of Rhetorical Sexual Culpability in the Antebellum Slave South

Faculty Sponsor: Marcy Sacks

Major: History  
Hometown: Dryden, Michigan

This project explores rhetorical sexual agency in slaveholding and enslaved communities of the antebellum South through personal expressions of purported responsibility. Conflicting with actual enforcements of sexual power and authority, individuals' pursuits of personal benefits and reduced culpability in illicit liaisons reacted with broader social interests and perceptions of race, gender, and class. Within the antebellum Victorian South, discourse surrounding sexual culpability infiltrated both white and black, as well as male and female, communities, as its social utility affected all involved parties in illicit sexual relationships.

Demonstrating not only the myriad sexual possibilities in antebellum Southern culture, conceptions of sexual responsibility also function to illuminate underlying racial and gender interactions. Through this research I hope to challenge popular preconceptions of Victorian sexual prudery as well as unified racial and gendered communities, while at the same time intending to demonstrate the social function and complexity of constructed sexual fault.

*Supported by: FURSCA*



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**PATRICK REILLY, '05*****Le malentendu franco-américain***

Faculty Sponsor: Dianne Guenin-Lelle

Majors: French, History  
Hometown: Hillsdale, Michigan

Recently there have been misunderstandings between the U.S. and France regarding certain issues of international importance, especially regarding the Iraq War and the recent law prohibiting wearing the *hijab* in French schools. The French have been vocal opponents of the American-led war, causing an anti-French backlash in the U.S. However, many Americans have been misinformed as to the true nature of the French stance in its criticism of the Iraq War. Another misunderstanding for Americans is the recent law that prohibits students from wearing veils in French public schools. Many Americans believe that this law violates the freedom of religion. Again Americans seem misinformed as to what this law represents and why it was passed. My presentation is meant to represent the French point of view in order to clarify where France really stands on these issues.



first-person American to discover whether such a representative voice exists and what story he/she has to tell about us, about who 'we the people' are. These narrative investigations reach their zenith in the masterpiece *Underworld*, a novel that encompasses a breadth of American characters and voices, including a reappearing first-person protagonist, and that asserts its 'representative' agenda in its song-like opening: "He speaks in your voice, American, and there's a shine in his eyes that's halfway hopeful."

How do the 'I' characters of DeLillo's novels share our voice? And how are their American identities conveyed in these narrative acts of self-representation? Do they speak with a Rousseauian sincerity? Do they demonstrate authenticity? Do they achieve Hegelian disintegration? Do they confess in Augustinian spirit? How do we, the implicit or addressed 'you' reader, ken them wholly and by doing so better understand ourselves as Americans as well?

My thesis seeks answers to these questions and examines the place that all of DeLillo's 'I-telling-you' narratives hold in the tradition of first-person novels. I also evaluate DeLillo's own growth as an author, specifically as an American who writes about America: our ideals, our myths, our desires, our sins, and, of course, our relationship with freedom.

The novels analyzed are divided into two groups: (1) *Americana* (1971), *End Zone* (1972), and *Great Jones Street* (1973) and (2) *The Names* (1982), *White Noise* (1985), and *Underworld* (1997).

*Supported by: FURSCA*

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**JAMES RIDER, '05****First-Person American in the Novels of Don DeLillo**

Faculty Sponsor: Mary Collar

Majors: English, Spanish  
Hometown: Troy, Michigan

The Whitmanesque 'I' continues to be the preeminent pronoun of our Americana. It is the pronoun of romantic volition, a shouted oath of liberty, and, in the case of Whitman, an 'I' that claims to speak for us all: a representative American voice.



Throughout his career, novelist Don DeLillo has experimented with the voice of the

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**PAUL ROBERTS, '07**

(See John Adams, '07, Paul Roberts, '07)

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**COURTNEY ROCHO, '05****Paternal Filicide**

Faculty Sponsor: Barbara Keyes

Major: Psychology  
Hometown: Union City, Michigan

There has been considerable literature on mothers who commit filicide, but little emphasis placed on fathers who murder their children. This study reviews filicide cases using records



from the Center for Forensic Psychiatry for the years 1995 to 2002 in order to compare male and female filicide offenders. There were 22 males with a mean age of 34.50 and 22 females with a mean age of 30.64. The mean age of the male victims was 3.52, and the mean age of the female victims was 4.11. With this small sample size, there were no significant differences in frequency of diagnosis of psychosis, depression, substance abuse, mental retardation, or personality disorder. When the homicides were categorized, females were the only ones to have committed a "psychotic" type of filicide, while men were numerically more likely to have committed the filicide in the "unwanted" or "punishment/abuse" types of filicide.

*Supported by: FURSCA*

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**JANAN SABA, '05****Satisfaction with College: Impact of an Intensive Summer Program**

Faculty Sponsors: Barbara Keyes, Drew Dunham

Major: Psychology  
Hometown: Livonia, Michigan

In the following study, we examined the impact of an academic summer program for entering first-year students on their college readiness and satisfaction as well as on retention. A total of 23 students (10



males and 13 females) participated in the study, 10 of whom participated in the academic summer program, and 13 of whom did not. The first hypothesis tested stated that those who completed a summer program before their first year of college would be more satisfied than the first-year students who did not participate in the program. Our second hypothesis was that both the summer program and the non-summer program students would be more satisfied during their spring semester than during their fall semester. Finally, the retention rate for summer program students was expected to be higher than the rate for non-summer program students. All research participants completed the Noel-Levitz Student Satisfaction Inventory two times, the weeks after fall and spring breaks. Research participants' responses to the

survey were compared with data from a national sample of college students.

*Supported by: FURSCA, First-Year Experience*

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## DANA SAUTER, '05

(See Brianna Granlund, '05, Dana Sauter, '05)

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## RYAN SEBOLT, '05

### Studying Views on Civil Rights, Religiosity, and Homosexuality in the African American Community

Faculty Sponsor: Trisha Franzen

Majors: Psychology, Gender Studies  
Hometown: Lansing, Michigan

Evidence suggests that many members of African American communities reject the idea of considering homosexuals as a minority, while in a seeming contradiction do not support laws that would allow workplace or housing discrimination against homosexuals. Through a series of interviews with African American students, this study looks at which sources have influences on African American perceptions of homosexuality. The survey focuses on the role of the church, family, and gender norms in shaping ideas about homosexuals.



*Supported by: FURSCA*

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## SAMATA SINGHI, '05

### Improving Access to Health Care in America: What Can Be Done?

Faculty Sponsor: Gregory Saltzman

Majors: Economics and Management,  
Chemistry  
Hometown: Chandigarh, India

Inadequate access to health care remains a major concern for Americans. Limits to public programs and gaps in employer coverage leave millions of Americans uninsured, creating substantial barriers to obtaining timely and appropriate health care, and hence adversely affecting population health. People without health insurance report fewer physician visits, lower prevalence of recommended preventive services, and delaying or forgoing required medical care. Subsequently, they are more likely to have potentially avoidable hospitalizations and experience in-hospital and cancer mortality. National debates and surveys reveal that many Americans, discontented by the rising health care costs and problems of access, see the need for a fundamental change in the structure of the U.S. health system.

In my research, I explore various reform options for improving access to health care for the American public. I contend that, while incremental measures may address short gaps in insurance coverage, long-term problems of access can be resolved only by establishing a system of health care that provides universal coverage and addresses the lack of affordable health services. One such policy option is the establishment of a single public payer system, similar to the Canadian model of health care. Another option is to establish a tax-financed public program to which persons contribute a certain percent of their gross income earmarked as the health insurance tax. Provisions for private supplementation under adequate conditions may be established. Finally, universal coverage may be achieved by mandating employer-based insurance, with a public "fail-safe" program covering for those who do not qualify for employer insurance.

*Supported by: FURSCA*



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## CHRISTOPHER SMITH, '05

### Substrate, Stoichiometry, and Solvent: Exploring a New Coupling Reaction Observed during the Oxidation of Organoboranes in Water

Faculty Sponsor: Clifford Harris

Major: Chemistry  
Hometown: Ann Arbor, Michigan

Being able to form carbon-carbon bonds is one of the most important aspects of organic chemistry, but being able to create these bonds in an environmentally friendly way is extremely difficult.

The purpose of my research was to develop a synthetic method for carbon-carbon bond formation by oxidizing trialkylboranes with potassium permanganate in water. A stoichiometry study in water was performed to optimize the ratio of borane to permanganate. This was done by hydroborating an alkene and then oxidizing a constant amount of the trialkylborane with varied amounts of potassium permanganate. The products of these reactions were analyzed by product distribution and percent yield. The optimal molar ratio of borane to permanganate was found to be 1:2.

Developing this hydroboration-oxidation reaction is very important for both its synthetic and environmental aspects. Potassium permanganate is an environmentally friendly reagent because it is recyclable, and it is a strong oxidizing agent. Water is one of the most environmentally friendly solvents, it is readily available, and permanganate is highly soluble in water. For these reasons, water is the ideal solvent for the oxidation. This synthetic method will hopefully serve as an environmentally friendly way of synthesizing various organic compounds.

*Supported by: FURSCA*



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## CYNTHIA SPURGAT, '06

### Concerto No. 4 in G Major

Faculty Sponsors: James Ball, Natalia Khoma, Viktor Uzur

Majors: Biology, Music  
Hometown: Boerne, Texas

Georg Goltermann was a German cellist, conductor, and composer. He composed overtures, songs, and organ preludes in his lifetime, but he is recognized more for his solo cello works, which consisted of eight concertos, sonatas, suites, and duos. Though his works were well admired during his time, they are now used more for cello studies.



I began working on Goltermann's Concerto No. 4 in G Major in the spring of 2004. I have performed various movements for juries and music major meetings. It was then recommended to me that I should try out for the Albion College Concerto Competition with this beautiful romantic piece since I had been working on it for so long, and it would be an enjoyable piece to do with the orchestra. I memorized the last movement, which to me is the most romantic part of the concerto, to perform for the competition. I will be performing this piece in the Concerto Concert on April 24 accompanied by the Albion College Symphony Orchestra.

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## YEN HOANG THIEU, '05

### Culture, Environment, Education, and Sustainable Tourism of a City in the Clouds: Sa Pa, Vietnam

Faculty Sponsors: Wesley Dick, Larry Steinhauer, Zhen Li

Majors: Economics and Management, International Studies  
Hometown: Hanoi, Vietnam

Sa Pa is a town in the mountainous northwest of Vietnam. Located 250 miles from the capital Hanoi, Sa Pa is home to Hoang Lien Son Nature Reserve—the only area of high mountain flora in Indochina. Sa Pa



is known not only for its cool climate but also for its unique bio- and ethnic diversity. In recent years, tourism (which started during the early 1900s) has been reemerging as a major component in Sa Pa's economy alongside agriculture and forestry. The flow of tourism is increasing every year, bringing about numerous changes—varying from positive to negative—to Sa Pa's environmental, cultural, and socio-economic characteristics.

According to my research and field study, the cultural gaps among the most dominant ethnic groups of Sa Pa (Viet, Dao, and Hmong), including their language differences, make up a major obstacle in building community cohesion, expansive participation in decision-making, and equal distribution of economic benefits from tourism in Sa Pa. These problems hinder sustainable economic growth in the town.

I propose that the language barrier and cultural gaps should be looked at as important dimensions of Vietnamese government policies and international NGO's agendas. Specifically, I suggest an educational restructuring in Sa Pa. The goal of the restructured education system would be to reallocate local human resources in order to promote education's legitimacy, particularly to the non-Viet people in the Sa Pa area. I believe that the restructured education system would empower the peoples of Sa Pa so that they would be able to build a more unified community and foster a sustainable economy.

*Supported by: FURSCA*

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## ERIN TOTH, '05

### An Automated Fluorescence-Based Assay for the Group I Ribozyme

Faculty Sponsor: Christopher Rohlman

Major: Chemistry  
Hometown: Bloomfield Hills, Michigan

Introns are segments of the genetic sequence that are removed in the processing of the genetic code and are found in virtually every form of life on earth. The Twort intron is spliced out of a strand of RNA



where it will never be translated into protein or be part of a structural RNA. The differential splicing of these introns can determine the function and rate of metabolism for a cell or organism. Group I introns are self-splicing RNA molecules (ribozymes) that are characterized by their three domain structure and their ability to carry out two transesterification reactions to remove themselves from the adjoining RNA sequence. The ribozyme splices itself from a Twort bacteriophage *in vivo*, post infection of *S. aureus*. Gene coding for ribonucleotide reductase is interrupted by three Twort self-splicing introns (ribozymes) called *nrdEs*. Twort group I introns are a subset of small self-splicing RNAs which are model systems for RNA structure and catalysis. Analysis of structure of this intron requires an assay of the effect of structural modifications. Traditional ribozyme assays utilize radiolabeled substrates or catalysts. The objective of this study is to develop an automated assay, which makes use of capillary electrophoresis and fluorescent detection. I have designed an assay system that incorporates a fluorescently labeled substrate and measures Twort ribozyme activity using standard genetic analysis technology.

*Supported by: FURSCA*



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## JORDAN TROISI, '06

### Money-Spending Disposition as a Moderator of the Relationship between Materialism and Other Individual Difference Variables

Faculty Sponsor: Andrew Christopher

Majors: Psychology, English  
Hometown: Holt, Michigan

Although research on materialism and money-spending attitudes is plentiful in the field of economic psychology, the interactive relationship of these two variables has not been studied.



The current research explored the interactive relationship between materialism and money-spending attitudes on impulse-buying tendencies, attitudes toward debt, sensation seeking, and openness to experience. Americans ( $N = 266$ ) completed Richins and Dawson's (1992) materialism scale; portions of money conservation scales from Furnham (1984) and Tang (1992); Verplanken and Herabadi's (2001) impulse-buying scale; Lea, Webley, and Walker's (1995) attitudes toward debt scale; Zuckerman's (1994) sensation-seeking scale; and Costa and McCrae's (1992) openness to experience scale.

Simultaneous entry regression analyses revealed two marginally significant interactions between materialism and money-spending attitudes. Individuals less materialistic and tight with money had particularly negative attitudes toward debt, and individuals less materialistic and loose with money were particularly open to experience. Results are discussed with respect to how materialism may be related to a variety of individual difference variables, both at the main-effect level and in interaction with money-spending attitudes.

The findings of research studies such as this have many practical implications, including influences on layperson judgments, heightened levels of self-awareness, and potential therapy and counseling avenues (as materialism levels and certain money-spending attitudes can be related to unhealthy psychological practices). Indeed, this study is but one small step toward understanding that there is much more

information to be analyzed about personality and money spending.

*Supported by: FURSCA*

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## JORDAN TROISI, '06

(See Kelly Parsell, '07, Jordan Troisi, '06)

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## NICOLE VILLIERE, '05

### Analysis of the Degradation of Semi-volatile Organic Compounds and the Application to the EPA Holding Time Limit

Faculty Sponsor: David Green

Major: Chemistry  
Hometown: Clarkston, Michigan

The U.S. Environmental Protection Agency (EPA) has set the holding time limit for semi-volatile organic compounds in soil samples at 14 days. My research analyzes the degradation of six compounds that are each representatives of a specific compound class. I have repeated the analysis of soil samples containing dibutyl phthalate that was previously analyzed by Anjali Arora from 2002 to 2004 for her honors research at Albion College. This compound was chosen in order to validate the reproducibility of the results attained through the previous study. I have also included in my study two isomers of the compounds that were investigated in this previous research: 1,4-dichlorobenzene and 4-nitroaniline. These compounds were chosen so that conclusions can be made regarding the behavior of compounds in the same class. Adhering to the guidelines outlined by the U.S. EPA in Method 3540C (1996) and Method 8270C (1996), my research investigates the degradation of chrysene, dibutyl phthalate, isophorone, 1,4-dichlorobenzene, 4-nitroaniline, and 3-methylphenol over a period of 40 days. I have examined the stability of the selected compounds within as well as past the 14-day holding time limit.



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## KATHERINE VOJTKO, '05

### Dental Anxiety, Dental Fear, and Self-Esteem as Predictors of Dental Hygiene

Faculty Sponsor: Andrew Christopher

Major: Psychology  
Hometown: New Carlisle, Indiana

Dental fear is ranked one of the most common fears globally, as 40 percent of the Western population is apprehensive about dental visits, and 20 percent are extremely anxious (Doebling & Rowe, 2000). This study was designed to determine if dental anxiety, dental fear, concern about one's smile, and health concerns predicted various dental hygienic behaviors.



It was hypothesized that dental anxiety and dental fear would be predictors why people engage in brushing and flossing. It was also hypothesized that concern for one's smile would predict the use of whitening products such as toothpaste or strips. A sample of 239 participants was recruited from dental and non-dental settings in Europe, Mexico, and the United States. Each person was surveyed on the Corah Dental Anxiety Scale (Corah, 1968), Dental Fear Scale (Kleinknecht, Klepac, & Alexander 1973), Smile Survey (Dental Cosmetic Advisory Service, 2004), and a general health concerns inventory.

The data were analyzed with multiple regression, using dental anxiety, dental fear, smile concerns, and health concerns as predictors of hygiene behaviors. The set of four predictors was significantly related to the use of whitening toothpaste and frequency of flossing.

These findings suggest that fear and anxiety affect individuals and cause barriers to their hygiene behaviors (Doebling & Rowe, 2000). Dental professionals and clinicians may be able to promote healthy oral hygiene practices by using such negative emotions as persuasive tools. In the process, they may be able to lessen negative feelings toward dental procedures.

*Supported by: FURSCA*

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**MATTHEW WALTERS, '05****German “Soft Power” and the European Union, 1990 to the Present**

Faculty Sponsor: Geoffrey Cocks

Majors: International Studies, German  
Hometown: Elgin, Illinois

Since the end of World War II, Germany has sought to create a position for itself within Europe. Even with all of the skepticism that it encountered as a nation—could it rebuild, how it could interact with



the West and the East, what were its true intentions—it went on, seeking only to be a member of the European community. In recent years, however, Germany has begun to take on an even greater role. After reunification, there was little doubt that Germany could be a major power in Europe. It had both the largest population and the largest economy. One does not, however, see the Germany of the 1930s in Europe today. The modern German state is one that does not seek to force its way upon other nations, but rather is a consensus-builder. This is not to say that it does not seek its due when it comes to power-sharing within Europe. With the advent of the European Union (EU), Germany has become an ever larger power, but not in the traditional sense. Germany, it seems, has almost taken on an elder statesman-like position in that it is always given an opportunity to voice its concern, and its view is held in high regard by other nations. This text explores Germany’s use of soft power in regards to monetary/fiscal policies, eastern enlargement, and the Common Agricultural Policy.

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**AMY WEINMEISTER, '05****“Dwelling”**

Faculty Sponsor: Bille Wickre

Major: Art and Art History  
Hometown: Edmond, Oklahoma

Photography invites interpretation. As a medium useful for documentary and explanatory purposes as well as artistic invention, photography has a vast scope and meaning. My interest in photography as a medium with special implications for postmodernism led me to create a series of three artists’ books addressing postmodern issues through photography.



The primary imagery of these books, abandoned houses and buildings in Michigan, serves as a central metaphor and the visual vocabulary for my exploration of postmodernism and photography.

*Supported by: FURSCA*

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**VALORIE WHITE, '05****Assessing Invasive Species at the Whitehouse Nature Center through the Use of Geographic Information Systems**

Faculty Sponsor: Dean McCurdy

Major: Biology  
Hometown: Gaylord, Michigan

According to the state and federal government, an invasive species is any species that is non-native to a particular area, and whose introduction causes or is likely to cause harm.



Invasive species threaten biodiversity, natural resource use, and even the stability of ecological systems. I explored distributional patterns of invasive species at Albion College’s Whitehouse Nature Center, a

managed environment that contains a variety of invasive species introduced at various points in time and through a variety of methods. During my study, I mapped out locations of four invasive species: garlic mustard (*Alliaria petiolata*), honeysuckle (*Lonicera japonica*, *Lonicera tatarica*), autumn olive (*Elaeagnus umbellata*), and emerald ash borer (*Agrylus planipennis*). Data collected in the field were entered into a geographic information system (a computer-based system for the analysis of spatially-oriented data) for the Whitehouse Nature Center. After creating an interactive database for the area (including maps of hydrological features, soil types, elevation, and historical features), I analyzed data on distributions of invasive species in relation to land-use patterns, soil types, presence of water, and patterns of existing vegetation. The final product is a series of maps that illustrates interactions of various invasive species in a managed environment. This model for the Whitehouse Nature Center can be used as a template for other managed properties, possibly to develop monitoring programs and management plans for invasive species.

*Supported by: FURSCA, MITC, NITLE*

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**JOE ZESSIN, '05****Albion, Michigan in the 1950s: Dreams and Realities of the Boom Years**

Faculty Sponsor: Wesley Dick

Major: History  
Hometown: Holland, Michigan

The decade of the 1950s is generally viewed as a time of splendid prosperity for Albion, Michigan. Albion’s population increased from 10,406 in 1950 to 12,749 in 1960.



This increase was stimulated by the arrival of the new Corning Glass Company in Albion in 1950. However, economic expansion does not tell the entire story of the city of Albion during the 1950s. Social problems such as crime, blighted neighborhoods, and racism were also prominent. In addition, rapid growth encouraged optimistic future projections. City planners created public works projects for a city of 20,000 people. Albion’s “boom” would last

for another 10 years, but the boom turned to bust in the 1970s. Corning Glass closed. The over-extended public works infrastructure became a taxpayer burden, unemployment became epidemic, and the city began to lose

population. The once prosperous city became a symbol of rustbelt America. One hope of this study is that the citizens of Albion will have an enriched sense of community history as they debate strategies for recovery. This study is part

of the project “Boom, Bust, Recovery: Explorations of Albion, Michigan—The Last Half-Century.”

*Supported by: FURSCA, NCUR/Lancy Initiative*

## 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 Kalamazoo, Mich., with his wife, Edith.

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.

## PAST ISAAC SYMPOSIUM SPEAKERS

### Elkin R. Isaac 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)

### Isaac Symposium Keynote Address

- Wade Davis (1999)
- Stephen Jay Gould (2000)
- Doris Kearns Goodwin (2001)
- Kurt Vonnegut (2002)
- Salman Rushdie (2003)
- Gloria Steinem (2004)

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