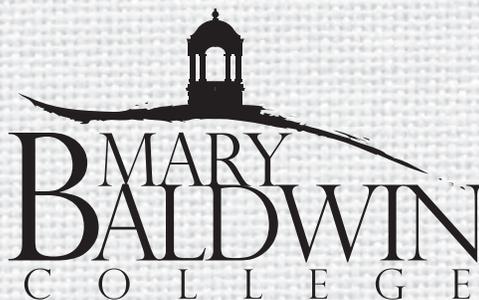


THE SHOWCASE OF UNDERGRADUATE RESEARCH,
SCHOLARSHIP, AND CREATIVE ACTIVITY AT MARY BALDWIN COLLEGE

SENIOR PROJECTS ● HONORS PROJECTS ● SPECIAL PROJECTS

MAY 9, 2013

CAPSTONE FESTIVAL



PARTICIPANTS IN THE CAPSTONE FESTIVAL HAVE BEEN NOMINATED BY THE FACULTY BASED
ON THE HIGH QUALITY AND ORIGINALITY OF THEIR WORK AND HAVE ACCEPTED NOMINATION.

CAPSTONE FESTIVAL

In the early days of Mary Baldwin Seminary, a Capstone Festival of sorts existed.

“All final examinations were held in public and members of the Board of Trustees and the townspeople attended to view students parse sentences, do intricate math problems, and recite soliloquies,” writes Professor Emerita of History Patricia H. Menk in her book *To Live in Time: The Sesquicentennial History of Mary Baldwin College 1842–1992*.

By the late 1800s, the practice of public recitations had disappeared. In 2006, Mary Baldwin College inaugurated a new Capstone Festival.

At each year’s festival, a select group of students, nominated by faculty, present their senior, honors, and special undergraduate research projects to the MBC community and the general public. The high quality and breadth of research, scholarship, and creative activities on display is a testament to the legacy of those earlier years and a celebration of our future.

The Festival is sponsored by the Advisory Board of Visitors, the Office of Sponsored Programs and Undergraduate Research, the Global Honors Scholars Program, and the Committee on Research, Scholarship, and Creative Activity.

FESTIVAL PARTICIPANTS

JACQUELINE AVERY

Project Advisor: Jodie Miller

Academic Advisor: Ellen Lucius

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Teaching Fractions: Research on Effective Theoretical Frameworks

Abstract: The concept of fractions is one of the most difficult in elementary and middle school mathematics education. As part of an undergraduate research project, a study of undergraduate students at a women’s liberal arts college was conducted to see if a relationship exists between how fractions are taught in the elementary years (conceptual or algorithmic) and college-age mathematical reasoning skills with rational numbers. This presentation will provide a brief overview of theories of fraction education and summarize the results of an undergraduate research project devoted to answering the following question: Does the type of fraction education that a student receives in elementary and middle school affect her ability to perform elementary fraction comparison, and subsequently understand higher math concepts? Finally, the presentation will address implications for current practice and propose directions for future research in fraction education.

Biography: Jacqueline Avery, a Staunton native, is a mathematics major with an education minor. She looks forward to teaching high school math locally and pursuing a master’s degree in math education.



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AMY JO BAKER

Project Advisors: Susan Stearns and Mary Hill Cole

Academic Advisor: Lallon Pond

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Backcountry Settlement: Land Rights of Settlers versus Land Speculators on the American Frontier, 1740-1780

Abstract: As America made its transfer from British colonial rule to a free democracy during the period of the 1740s through the 1780s, land became a human rights issue. Colonial leaders wanted new territories to become a commodity that could be bought and sold, whereas frontier settlers wanted recognition of ancient cultivation laws for those who could not afford to pay cash prices for land. The focus of this research is to look at the struggle of backcountry settlers as they fought to make a place for themselves in the new United States.



PHOTO BY WOODS PIERCE

Biography: Amy Jo Baker is an Adult Degree Program student from Verona. She is double majoring in history and anthropology, with a minor in philosophy. She has previously presented her research at the Phi Alpha Theta regional conference and at the Southern Anthropological Society annual conference in Birmingham, Alabama. She has two children, Kearee, 17, and Justin, 15. She plans to continue to graduate school and earn her PhD in environmental anthropology.

VICTORIA BARRETT

Project and Academic Advisor: Daniel Métraux

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Pakistan’s Role in the Future of Afghanistan

Abstract: The country of Afghanistan has been plagued by warfare and instability since the Soviet invasion of Afghanistan in 1979. Thirty-four years later, Afghanistan is still on the brink of potentially descending into chaos. The combat mission of the United States Armed Forces will come to an end in 2014 and will officially transition to a support mission. The number of troops that will remain in Afghanistan during the support mission is still being discussed. The fate of Afghanistan’s future is not in its own hands, but in the hands of its neighboring country Pakistan. Since the partition of India, Pakistan has been determined to establish close ties with Afghanistan at all costs. As a result, Pakistan will play a large role in Afghanistan once the combat mission of the United States Armed Forces comes to an end in 2014. This is due to Pakistan’s security and its economic and political interests in Afghanistan that are essential to blocking India’s influence in the region.

Biography: Victoria Barrett is an international relations major from Chesapeake, Virginia. She is a cadet in the Virginia Women’s Institute for Leadership and is a Distinguished Military Graduate. Barrett will commission into the United States Army as a Second Lieutenant in May of 2013.



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JOHANNE BEAUDOIN

Project and Academic Advisors: Martha Walker and Anne McGovern

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: Masking Problems in the Play *Les Belles-Soeurs*

Abstract: Historically, the Francophone population of Quebec was disadvantaged linguistically and economically and repressed by a strict Catholicism. During the 1960s, the province went through many changes, politically, culturally and economically. In 1965, Michel Tremblay wrote the play *Les Belles-Soeurs*, depicting the lives of

eight women from the working class who meet to help Germaine glue the million trading stamps she won in a contest. Johanne examined the balanced use of exaggeration and realism in the text and the staging of the play to express the deep sadness and grief of the characters. This structure offered a distorted mirror to the audience, helping them realize the issues that oppressed them. This presentation will focus on the signification of the trading stamps in the hostess's poverty-ridden life.

Biography: Johanne Beaudoin is a French major in the Adult Degree Program. She was born and raised in Quebec, Canada, but has lived in Charlottesville, for the past seven years. In the fall of 2013, Beaudoin will teach French at the International School of Charlottesville.



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KAITLYN CEROW

Project Advisor: Joseph Sprangel

Academic Advisor: Jane Pietrowski

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: The Power of Wind

Abstract: Wind power has been used to solve various problems around the world for centuries. In recent years it has been used as an alternative energy source to curb dependence on fossil fuels and reduce air pollution. This research focuses on three options available to a private individual with interest in wind power. First, through tax credits and energy savings, owning a personal turbine has become affordable in most places across the United States. Second, major wind developers have created wind farms by leasing farmland across the country from willing and able landowners without disturbing their land use. Third, socially responsible investing (SRI) is another way to support the industry without such a serious lifestyle commitment. There are several mutual funds and other socially responsible investment options. For more risky investments, an example is shared where one can choose to invest directly into the top two wind manufacturers worldwide, General Electric and Vestas.



PHOTO BY WOODS PIERCE

Biography: Kaitlyn Cerow is a Business for a Sustainable Future major from Ashburn. She has participated as a member in STARS and is the VWIL commanding officer. In May 2013, she will commission as a Second Lieutenant in the US Army in the Medical Service Corps.

ANGELICA FLEMING

Project Advisors: Anne Allison and Paul Callo

Academic Advisor: Paul Deeble

Type of Project: Senior Project

Presentation Category: Poster

Title: The Measurement of Estrogenic Activity of Thermal Receipt Paper and its Effects on the Reproduction of *Caenorhabditis elegans*

Abstract: Endocrine-disrupting chemicals (EDCs) are toxic and ubiquitous pollutants that interfere with the body's endocrine system. These chemicals have been shown to produce many adverse effects on many different physiological systems in humans and other species.

While many studies on EDCs have been and are being done, it remains uncertain to what extent these environmental pollutants influence the health of humans and other organisms. One particularly common EDC is Bisphenol A (BPA), which can be found in items such as water bottles, the inside lining of cans, and thermal receipt paper that you typically receive after purchasing something at a store. In a study that sampled different thermal receipt papers from across the world, the amount of BPA in receipt papers was determined. BPA was detected in 94% of thermal receipt paper samples at various concentrations. Despite this, there exists scant knowledge on the toxicological and endocrine-disrupting effects of thermal receipt paper. In my research, the estrogenicity of thermal receipt paper was quantified using the yeast estrogen assay (YES) and toxicity effects were tested using a reproduction test with *Caenorhabditis elegans* (*C. elegans*), a transparent, free-living nematode. The number of eggs and *C. elegans* were counted over a five-day period after being exposed to different concentrations of thermal receipt paper extract. The results of this study show that thermal receipt paper has estrogenic activity and produce toxic effects on the reproduction of *C. elegans*. With thermal receipt paper being used every day by major manufacturers and consumers, and exposed to our environment, it is important for the possible harmful effects to be further investigated.

Biography: Angelica Fleming is a biology major with minors in chemistry and sociology from Chesapeake. Fleming has future plans of pursuing her lifelong dream of becoming a family physician. In the fall, she plans to work as a research assistant at Eastern Virginia Medical School in Norfolk.



PHOTO BY WOODS PIERCE

DAVID FOLEY

Project Advisor: Bruce Dorries

Academic Advisor: Dan Dowdy

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Salem VA Medical Center Social Media Campaign

Abstract: In an effort to help Veterans in Southwest Virginia improve the quality of their health care, David

Foley teamed up with the public affairs office at the Veterans Affairs Medical Center in Salem to promote their social media initiative. By promoting the social media site, David and the public affairs team enabled the hospital to effectively communicate with the Veteran population and provide them with information regarding upcoming health clinics, events, and policy changes.

Biography: David Foley was born in Bexar County, Texas, and grew up in Troutville. He attended Lord Botetourt High School and Virginia Western Community College before enlisting in the Army as a public affairs specialist. During his time in the Army, he worked on many major newspaper articles, including during the Iraqi referendum election. He is attending Mary Baldwin's Adult Degree Program as a GI Bill recipient under the Yellow Ribbon Program. He plans to work in public relations with a veterans organization after graduating.



KATHARINE M. GIVEN

Project and Academic Advisor: Janna Segal

Type of Project: Special Project

Presentation Category: Presentation with multi-media support

Title: Dramaturging Edward Albee's *Three Tall Women*

Abstract: Edward Albee's *Three Tall Women* tells the story of a 91- (or 92-) year old woman, covering her life and last moments. Given worked on a February 2013 production at the Mary Baldwin College Theatre with director Dr. Janna Segal, attempting to tell this story as cohesively as possible. She attended rehearsals and production meetings to help bring the production together. She also worked with the audience by designing the lobby and holding talk-backs after performances to engage the Staunton and Mary Baldwin theatre communities in a dialogue about the nature of the play, life, and aging.

Project and Academic Advisor: Mary Hill Cole

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: 'Suffer Not a Woman to Teach': The Decline of Christian Women's Position in England Before 1215

Abstract: When an early England was re-Christianized by Roman missionaries in the seventh century, women in the highest classes were essential in accepting and spreading the new faith. As Christianity grew in England over the next few centuries, women took on extremely important roles in various faith communities as nuns and abbesses. Men saw them as equals in the faith, and in some cases women even held positions of authority over men and other women. However, in the ninth and tenth centuries, invaders destroyed many Christian establishments. When the establishments were rebuilt and as Christianity became more common and institutionalized, roles for women grew



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far scarcer. Using primary and secondary sources, Given tracked this marked decline for women who had enjoyed such powerful positions in earlier centuries.

Biography: Katharine Given is a theatre and history major from Virginia Beach. After graduation she is taking a break from school while still remaining active in her two fields through volunteer work. She hopes to pursue graduate studies in theatre history in the next several years.

LAUREN GREEN

Project Advisor: Peter Ruiz-Haas

Academic Advisor: Maria Craig

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: The Destruction of Bisphenol A and Bisphenol S through Ozonation

Abstract: Bisphenol A is a known endocrine disruptor that has been found in trace amounts in waste water. These small amounts have been found to cause feminization of male fish, which could also mean that it can cause adverse effects in people as well. Ozonation is an advanced oxidative process that is commonly used to treat waste water to clear it of most contaminants, but like other processes the amount of destruction of bisphenol A seen is small. This work uses ozonation to find out what percentage of bisphenol A could be destroyed in under 30 minutes and then compares that to the amount of bisphenol S destroyed by the same process. While bisphenol S has not been studied as much, its similarities in chemical structure to bisphenol A and other endocrine disruptors make it a good candidate for study. Results show that overall it is difficult to destroy even 50% of the bisphenol A through ozonation while it is possible to destroy over 50% of bisphenol S.

Biography: Lauren Green is a chemistry major with a biochemistry emphasis. She is from Newport News and after graduating this May she will continue pursuing her dream of working with animals by becoming a veterinarian.



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NANCY C. WILL HILL

Project Advisor: Susan Stearns and Mary Hill Cole

Academic Advisor: Bob Robinson

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Ever Changing Perceptions of America's Mentally Ill

Abstract: During World War II, a staffing shortage in mental hospitals across the country led to conscientious objectors (COs) filling the open positions. Seeing the mistreatment and poor living conditions within America's mental hospitals, the COs began to educate the public about new



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treatment methods and how to interact with the mentally ill. This shift in public perception led to a movement known as deinstitutionalization of the mentally ill and new regulations meant to give the mentally ill more rights over their treatments, bodies, and admittance to hospitals. Over the course of the following decades, it came to light that deinstitutionalization fell short of its supporters' expectations, and mentally ill people joined America's homeless in cities all across the country. Once again, Americans' perceptions of the mentally ill had changed.

Biography: Hill is an Adult Degree Program student from Mt. Crawford. She will be graduating in May with a BA in history and minors in education and women's studies. In the fall, she will be student teaching and will continue working with her family on their dairy farm and creamery.

ELIZABETH JACKSON

Project and Academic Advisor: Chandra Mason

Type of Project: Senior Project

Presentation Category: Poster

Title: Is That Real? A Look at the Effect of Realistic Television on Belief Change

Abstract: Since the 1970s, most studies have failed to show a significant effect of message modality (i.e. written, audio, visual, etc.) on attitude change (e.g. belief in the paranormal). However, studies on paranormal attitudes have found empirical support for a relationship between message modality and attitude change, a relationship that is moderated by education level and gender. This study sought to expand our knowledge about this relationship by examining the relationship between degree of reality portrayed in television shows and paranormal beliefs. Specifically, I hypothesized that greater realism in television shows would result in greater change in attitudes about the paranormal. To test this hypothesis, I asked participants (N=77) to complete the Revised Paranormal Belief Scale before and after watching an episode of one of three paranormal-themed shows that varied in degree of realism. A 2x3 mixed ANOVA revealed a significant difference in the interaction between show type and time (i.e., before and after). To follow up on this finding, a post-hoc test was conducted to examine where the interaction was significant. The post-hoc test revealed one significant difference in the comparison of the after surveys for the reality television show and the moderate reality show. It is possible that the most realistic television show had an inoculating effect on participants, thereby increasing skepticism and showing a decrease in paranormal beliefs.

Biography: Elizabeth Jackson is a psychology and history major from Virginia Beach. She hopes to continue to work in an academic environment as a researcher, teacher, or professor like her mentor and good friend Chandra Mason.



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MICHELLE JONES

Project Advisor: Katherine Turner

Academic Advisor: Sarah Kennedy

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: How Female Slave Narratives Divulge the Reality of the African-American Woman

Abstract: In the 21st century, neo slave narratives are emerging and shedding light on an American experience that has been ignored for many years. Authors such as Toni Morrison and Alice Walker have worked to provide insight into the lives of black women, continuing a tradition that began centuries ago with the work of female slave narratives. By examining the ways in which literary devices are used in the narratives of Mary Prince, Harriet Jacobs, and Lucy Delaney, all audience members can understand the many ways that African-American women sought to express their plight. While black women are no longer in bondage, the words of these narratives show that the change to free status has not ended the haunting ordeals that occurred within slavery. Through the continued observation of the narratives of Prince, Jacobs, and Delaney, the negative view of the black woman continues to be combated.

Biography: Michelle Jones, an English major who is minoring in both creative writing and African-American studies, is from Dinwiddie. Jones would like to further her studies in English and plans on attending graduate school in August of 2013.



BENJAMIN E. LACY

Project Advisor: Lundy Pentz

Academic Advisor: Abby Arnold

Type of Project: Senior Project

Presentation Category: Poster

Title: Endocrine-Disrupting Compounds and Intersex in the Red Breasted Sunfish, *Lepomis auritus*

Abstract: Recent studies have shown certain species of fish inhabiting waters with high concentrations of endocrine disrupting compounds (EDCs) have increased incidences of testicular oocytes (a form of intersex) among males. The red breast sunfish (*Lepomis auritus*) is a popular sport fish native to the Eastern United States, yet little previous knowledge exists about testicular oocyte occurrence in them. The goal of this study was to determine if *L. auritus* forms testicular oocytes (TO) and if so, do they do so at similar rates to previously studied species. Fish were captured from one site along the Shenandoah River and another along the Middle River. Gonads were excised, sectioned, and stained to determine presence of TO. Water samples were obtained and estrogenicity was determined by means of a Yeast Estrogen Screen (YES). We found that *L. auritus* does form TO (36% of specimens captured) at comparable rates to the common roach (*Rutilus rutilus*) but are much



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less sensitive to EDCs than smallmouth bass (*Micropterus dolomieu*).

Biography: Ben Lacy is a biology major from Charlottesville. He has enjoyed working with the chemistry and biology departments in fulfillment of his senior project. Future plans will hopefully include dental school.

HANNAH LAYNE

Project Advisor: Katherine Turner

Academic Advisor: Marion Ward

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: The Womanist Angel

Abstract: In the speech "Professions for Women" (1931), Virginia Woolf urges women to kill "the angel in the house" — the nineteenth-century stereotype that keeps women from discovering their true identity. This paper explores how "the angel in the house" is depicted (and eventually killed) in some ground-breaking African-American novels: W.E.B. DuBois's *The Quest of the Silver Fleece* (1911), Zora Neale Hurston's *Their Eyes Were Watching God* (1937), and Alice Walker's *The Color Purple* (1982). The ideology of "the angel in the house" is enforced by the male characters of these novels in order to maintain patriarchy. The female characters are illustrated as silenced, marginalized, and oppressed. In each novel, the female protagonists struggle with discovering their identity, finding their voice, and determining where they belong in society, in contexts specific to the experience of African Americans. In each novel, the women embrace what Alice Walker deems a "womanist" personality in which they rely on their relationships with other female characters in order to stand up against oppression and "kill the angel in the house."

Biography: Hannah Layne is an English major with a minor in education from Staunton. In the fall of 2013, she plans to student teach at a local elementary school.



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ANDREA KIBLER MAXWELL

Project Advisor: Sara Nair James

Academic Advisor: Virginia Trovato

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Iconography of Saint Peter: Finding Meaning in the Brancacci Chapel

Abstract: Painted nearly 600 years ago, the fresco cycle in the Brancacci Chapel in Santa Maria del Carmine, Florence, continues to intrigue and inspire artists and scholars alike. The influence of the Brancacci Chapel on the art world continues unquestioned; however, the chapel embodies more than a revolution in art theory and practice. The frescoes that adorn the chapel walls culminate in one of the most extensive Petrine cycles known. In this work, Maxwell uses the four methods of scriptural interpretation to unlock the meanings of the frescoes. Unrealized until

now, the Brancacci Chapel fresco cycle functions as a sermon, representing the life of Saint Peter, while simultaneously providing support for the papacy, Florentine government, and education for proper Christian living for the church and followers.

Biography: Andrea Kibler Maxwell is an art history major and Adult Degree Program student from St. Albans, West Virginia. She spent the last two years working as a teaching assistant and studied abroad in Italy last May. This fall, she will enter a graduate program in art history at either Ohio University or Kent State University, with a full scholarship and teaching assistantship.



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SHANEQUA MCDOWELL

Project and Academic Advisor: Maria Craig

Type of Project: Senior Project

Presentation Category: Poster

Title: LL-37 Peptide Interactions with CpG and Poly-A DNA

Abstract: LL-37 is a small, antimicrobial peptide that is over-expressed in certain tissues in autoimmune diseases such as lupus and psoriasis. The peptide binds to DNA with unknown specificity and facilitates entry into certain cellular compartments. Upon entering the cell, the complex causes an immune response against self-DNA, and as a result the immune system attacks and damages tissue. In our experiments, we used electrophoretic mobility shift assays (EMSA) to investigate whether the LL-37 would bind to different sequences of DNA (CpG and Poly-A). The results of our experiments showed similar binding between LL-37 and both CpG and Poly-A DNA. The LL-37 bound to both DNA sequences at constant DNA concentrations of 2.5 μM and LL-37 concentrations greater than 10-15 μM . These results suggest that LL-37 binding to DNA may not be highly dependent on DNA sequence.

Biography: Shanequa McDowell is a chemistry major with a emphasis in biochemistry and a minor in Health Care Administration from Stephens City. She worked as an RA on campus for three years. She plans to apply to graduate school in the coming year.



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JESSIMOND MCLAUGHLIN

Project Advisor: Allan Moyé

Academic Advisor: Terry Southerington

Type of Project: Senior Project

Presentation Category: Performance or reading

Title: *The New Romanovs*

Abstract: July of 1918 marked the end of Imperial rule in Russia with the assassination of the Romanov family in Ekaterinburg. Propelled into infamy by their controversial deaths, the Romanov family's downfall remains one of the most fascinating stories in history. *The New Romanovs*,

a project in screenwriting, seeks to examine the family based on primary sources and re-imagine their lives in modern terms. Nick Romanov is the Governor of Texas who thinks he has a hold on his picture-perfect family. He soon comes to realize, however, that things are not what they seem. His life begins to fall apart, and luckily, a documentary film crew is there to catch (almost) every moment.



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Biography: Jessi McLaughlin is a theatre major from Johnson City, Texas. She has spent most of her life doing theatre and only in the past few years has realized her passion for film. She intends to return to Austin, Texas, to find a job in the theatre or film industry.

MANDY MILLER

Project Advisor: Nancy Ross
Academic Advisor: Paul Ryan
Type of Project: Senior Project
Presentation Category: Visual or audio-visual creation
Title: Equa Equa Ulisi

Abstract: Inspired by her full-blooded Cherokee great-great grandmother, her "Equa Equa Ulisi," Miller decided to incorporate selected symbols from Native American tribes into her ceramic senior project. Using her sculptural pieces as a three-dimensional aspect of drawing, Miller made the symbolic language of the Native American culture more universal. Each piece is a representation of a selected symbol of the Native American culture. The individual pieces are covered in harsh textures that reflect the struggles of the Native Americans, and the similar relationship the pieces share illustrates the unity the Nation still has despite its struggles. Equa Equa Ulisi speaks to the transformation of the two-dimensional symbols of the Native American Tribes into three-dimensional sculptural works of art.



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Biography: Mandy Miller is a studio art major with emphases in ceramics, drawing, and painting from Staunton. After graduation, Miller plans to continue her career in art, using her artwork as a tool for ministry.

MEREDITH MILLER

Project and Academic Advisor: Laura van Assendelft
Type of Project: Senior Project
Presentation Category: Presentation with multi-media support

Title: A Clouded Vision: Using Word Clouds to Examine Rhetoric in Convention Speeches

Abstract: Presidential rhetoric has been increasingly studied as a way of critiquing a president's stance on various issues, including whether or not a candidate is likely to be a responsible party leader or a vote maximizer. This project uses word clouds, visual representations of word frequency in documents, to analyze the national

party convention speeches of Barack Obama and Mitt Romney during the 2012 presidential election, in an attempt to determine which party model these candidates follow.

Project Advisor: Judy Klein
Academic Advisor: Laura van Assendelft
Type of Project: Senior Project
Presentation Category: Presentation with multi-media support

Title: A "NEET" Problem: Youth Unemployment in Northern Ireland

Abstract: One in five youths in Northern Ireland between the ages of 16 and 24 is unemployed, and this rate continues to increase. This project examines the causes of rising youth unemployment in Northern Ireland for youths 16–24, particularly those who are considered not in education, employment, or training (NEET). Policy solutions for combating this problem on a macroeconomic level are considered, while also recognizing limitations to these solutions.

Biography: Meredith Miller is a political science and economics major from Purcellville. This past year, she has served as Honor Council Chairwoman of the Student Government Association. She is currently working to become gainfully employed and one day aspires to earn a master's degree in public policy.



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IAN GREGORY MOWBRAY

Project Advisor: Abigail Wightman
Academic Advisor: Abigail Arnold
Type of Project: Senior Project
Presentation Category: Presentation with multi-media support

Title: Shifting Paradigms: Individualism within American Education and Its Effect on the New Group-Centered Movement

Abstract: In this project, I choose to look at individualism within the educational system and how it affects student outlook towards more sociocentric methods of education.

To study this, a survey was given to 35 students on the Mary Baldwin College campus and was used to gauge student attitudes towards group work both in their high school and college careers. Students overall showed a negative view towards group work in their high school and college careers, despite many claiming to see the positive learning benefits. From their perspective, this was mainly due to their grades relying on other students' work. When applying this to American culture more broadly, individualism could be so engrained in youth that social issues such as government-funded healthcare may be seen by those entering the adult world as an encroachment on their individual rights. Shifting teaching paradigms towards sociocentric models may



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produce citizens who are more socially engaged and aware of the class system and inequalities, possibly increasing support of legislation aimed at social change.

Biography: Ian G. Mowbray is originally from Scottsville. In January of this year, he graduated from Mary Baldwin College with a bachelor of arts in anthropology/sociology. Currently working for Relay Foods, Mowbray is applying his anthropological research skills in analyzing Relay's customer base. He plans to continue to graduate school in the fall of 2014 to study for a PhD in anthropology.

MARIA NAVARRO

Project and Academic Advisor: Maria Craig

Type of Project: Senior Project
Presentation Category: Poster
Title: LL-37 and Interactions with CpG DNA

Abstract: LL-37 is an antimicrobial peptide that is a member of the cathelicidin protein family. The interest in this specific protein has grown since scientists realized that improper levels of LL-37 are associated with chronic respiratory diseases and autoimmune diseases such as psoriasis. The experiment involves performing a gel assay in order to determine the strength of binding of LL-37 to certain DNA sequences. Specific amounts of CpG (DNA) and LL-37 were combined and analyzed by gel electrophoresis to determine whether binding occurs. By analyzing these gels with a gel imager, we were able to develop a method in which we saw the correlation between CpG and band density, and were able to confirm that LL-37 binds to CpG DNA. We also investigated self-associations of LL-37 using Western Blotting.

Biography: Maria Guadalupe Navarro is a chemistry major with a biochemistry emphasis from Manassas. She is the first in her family to graduate from a four-year college.



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Through chemistry, she discovered her passion is working in the laboratory. She plans to fulfill her dream of working in a pharmaceutical company, but later in life aspires to become a teacher and inspire other students to be as passionate about chemistry as she is.

CASEY C. NYE

Project Advisor: Jenna Holt
Academic Advisor: Virginia Trovato
Type of Project: Senior Project
Presentation Category: Presentation with multi-media support

Title: The Role of a Damaged Ventromedial Prefrontal Cortex in Moral Judgment: A Critical Literature Review
Abstract: The ventromedial prefrontal cortex (vmPFC) is an area of the brain that is considered a base for emotions, behavior, and particularly decision making. Studies in humans with bilateral damage to this cortex have demonstrated acquired social conduct deficits, such as the inability to respond appropriately to social cues in the environment or a failure to obey conventional social rules. Primarily, though, patients who have had lesions to the vmPFC display dramatic disturbances in personality and possess an overwhelming lack in their character and social awareness. Nye created a critical literature review of articles written by psychologists who conducted experimental studies that were based on finding a selective deficit in personal moral judgment following damage to the vmPFC.

Biography: Casey Nye is a January 2013 graduate, earning a bachelor's degree in psychology with a concentration in criminal justice, from Lexington. She plans to pursue her goal of becoming a forensic psychologist by applying to graduate school in the fall.



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PHOTO BY IAN BRADSHAW

MADELINE S. OGDEN

Project and Academic Advisor: Judy Klein

Type of Project: Senior Project

Presentation Category: Poster

Title: Climate Change and Food Security in Bangladesh

Abstract: As global climate change poses an increasing threat to the world, we must look at what will happen to the developing world, especially countries which already lack food security. Bangladesh is in the extremely volatile region of the tropics and has been and will continue to be hit hard by climate change. Changes in growing and seasonal patterns will result in production changes and increases in the price of rice, the most important crop to Bangladeshis. The extremely poor will be affected the most. This presentation addresses the importance of adequate post-harvest technology to provide proper food storage and distribution during times of high prices.

Biography: Madeline Ogden is an economics major from Alexandria. In the fall, she will enter a master's of public policy program at the Trachtenberg School of Public Policy and Public Administration at George Washington University in Washington, DC.



PHOTO BY WOODS PIERCE

VIRGINIA POPE

Project and Academic Advisor: Daniel Métraux

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: American and Japanese Responses to Obesity

Abstract: Today, over two-thirds of Americans are overweight, and one-third are obese. While Japan is often touted as having one of the lowest obesity rates in the world, the country uses a modified Body Mass Index scale. According to this modified scale, just over one-fifth of the population is obese. Both Americans and Japanese are extremely concerned with their weight and seek ways to reduce it. This has resulted in both cultures focusing on dieting and government policies. Both Japan and America have developed "dieting cultures" that do little to actually decrease the obesity rate and potentially contribute to it. Each country has also looked to political regulations to reign in the problem, but their actions to date will likely create more ill health effects than they solve. Americans are becoming used to larger sizes than normal, while simultaneously putting pressure on the population to be normal or underweight.

America has taken political action in the form of educating children and has also debated the use of bans and taxes as a form of consumption control. Japanese reject larger sizes despite the growing waistlines in the country. In Japan, the pressure and the desire to be thin or underweight is



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strongest for women under forty, which has contributed to the appearance of eating disorders. The Japanese government has passed laws that state that those with a waist measurement exceeding a certain number must receive diet and lifestyle re-education courses. Until education about weight issues is improved in both countries and society moves away from dieting culture, the obesity problem will likely continue to grow.

Biography: Virginia Pope is an Asian studies major from Chester. Next year, she will continue her education at Mary Baldwin in order to complete a second major in international economics and business.

TARA S. RIGGS

Project Advisor: Daniel Métraux

Academic Advisor: Laura van Assendelft

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Requiem for Disaster: Evaluating State Failure in Yemen

Abstract: The study of state failure is critical to the understanding of the contemporary world order. Yemen, the poorest country in the Middle East, seems likely to become the next country to be added to the list of contemporary failed states. Stephen W. Day recently wrote, in a report in *Foreign Policy*, that intolerance of political and social differences that exist in both the former North and South Yemen will catalyze true state failure.

This project combines scholarly definitions of state failure to create a definition that captures the realistic problems state failure creates for nations. The significance of state failure in Yemen can be derived from many factors and theories, but examining the implications of state failure in Yemen and the rest of the global community leads to the most realistic impact calculus.

Biography: Tara S. Riggs is a double major in political science and economics from Levittown, Pennsylvania. She has interned for Americans for Informed Democracy and the Hudson Institute's Center for Political Military Analysis. She will serve as a Charles Koch Fellow at the Institute for World Politics after graduation.



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QUIANA ROBINSON

Project and Academic Advisor: Edward Scott

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: 'Oh What Did I Do, to Be So Battered, Black, and Blue? I Don't Know When but I WILL Enter': Lifting African-American Women up from the Margins

Abstract: Slavery is one of the greatest crimes against humanity. The heinous institution is responsible for the defamation of the character of African-American women today. Described as base, violent, and sexually licentious, African-American women suffered a significant reduction of their intrinsic worth. Despite the abolition of slavery

148 years ago, the negative perceptions and caricatures still remain. They currently permeate almost every aspect of life, particularly the justice system. The two most prominent stereotypes of African-American women are the Jezebel and the Sapphire.

These two caricatures impede black women from receiving adequate legal protection in instances of sexual harassment and domestic violence. The race-based stigma generated by the Jezebel and Sapphire caricatures excludes these women from being vulnerable to abuse because they are contradictions to what is associated

with the pre-conceived notion of the classic raped or battered woman. This presentation will focus on the Jezebel stereotype and Hegel's theory of recognition.

Biography: Quiana Robinson is a philosophy major with a minor in African-American studies from Accokeek, Maryland. Robinson's current career goal is to become an attorney specializing in the public interest. She hopes to attend law school in the fall of 2013. Eventually, Robinson would like to become an administrative law judge. Robinson has a deep passion for serving the community and is also a strong advocate for social justice.



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REBECCA D. RUDOLPH

Project Advisor: Eileen Hinks

Academic Advisor: Steven Mosher

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Evaluation and Analysis of Health Care Services at Mary Baldwin College, A Four-Year Liberal Arts College

Abstract: College health services have become an increasingly important facet of health care delivery in the United States. These services must care for large numbers of students at particularly vulnerable times for occurrences of diseases while at the same time providing students with the knowledge to develop healthy habits for life. Since this care is so critical for students' present and future health, the student health center takes on many roles including, but not limited to, providing basic medical services, counseling services, and preventative health services. This study examines this critical role of Mary Baldwin College's student health care services in providing services for its unique, women's centered residential student body. The evaluation and analysis were conducted using information collected from Mary Baldwin College and national student survey reports completed through the American College Health Association-National College Health Assessment and the National Alliance on Mental Health. The conclusion includes critical suggestions for future research, including an original survey created for this purpose.



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Biography: Rebecca Rudolph is a Health Care Administration major with an emphasis in public health and a minor in women's studies from Stafford County. She plans to enter a master of public health/juris doctor program in order to pursue a career as a health advocate, focusing on women's and college health.

ELLEN SCOTT

Project Advisor: Katherine Turner

Academic Advisor: Sarah Kennedy

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: A Plunge into Madness: Women and the Pressure to Write

Abstract: This senior thesis explores the recently realized concept of the "plunge memoir" using Charlotte Perkins Gilman's "The Yellow Wallpaper," Sylvia Plath's *The Bell Jar*, and Susana Kaysen's *Girl, Interrupted*. The plunge memoir emerges out of a collision between outside patriarchal influence and an internal pressure to write, creating a formula that yields conflict, collapse, and — sometimes — recovery. Based in both feminist and psychoanalytic literary theory, this essay attempts to understand how the mental collapse of each work's central female character and its causes are represented.

Biography: Ellie Scott is an English major and a creative writing minor, born and raised in Strasburg. She intends to pursue a master's degree in library science and was recently inducted into Sigma Tau Delta.



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BRITTANY SHAW

Project and Academic Advisor: Maria Craig

Type of Project: Senior Project

Presentation Category: Poster

Title: LL-37 Binding to Poly-G DNA

Abstract: In previous studies, autoimmune diseases such as psoriasis and lupus have been connected with an over-expression of the peptide, LL-37. LL-37 can bind to DNA and cross the cell membrane, and this process allows entry of self-DNA into cellular compartments, where it can activate the immune system. The binding specificity of LL-37 to DNA sequences has not yet been studied. To understand these interactions, we investigated how LL-37 binds to certain DNA sequences, both immune-activating CpG sequences and non-activating poly-G sequences. We used gel electrophoresis in combination with further image analysis to assess formation of LL-37 and DNA complexes at various concentrations of LL-37. Our results indicate that both sequences bind to LL-37, but with different affinities.

Biography: Brittany Shaw is a chemistry major from Richmond with minors in health care administration and Spanish. She plans to join the Peace Corps and eventually to become a pediatrician.

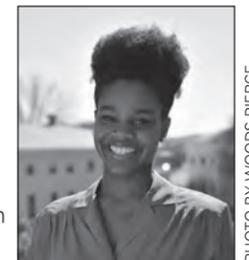


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AUBREY SPARKS

Project Advisor: Laura van Assendelft

Academic Advisor: Laura van Assendelft and James Gilman

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: Carrying Her Own Weight: Women in Mayoral Positions

Abstract: This research seeks to investigate the barriers faced by women running for local office and how those obstacles compare to those faced by women in gubernatorial and congressional campaigns, leading to an analysis of women's involvement at different levels of government. The hypothesis is that women will be more equally represented at lower-level positions, owing to the barriers of the "glass ceiling" and professionalism for women holding higher office. A further hypothesis, however, posits that gender discrimination will be more prevalent in local campaigns than in campaigns for higher offices, because the lack of professionalism allows for more frank communication and airing of grievances and prejudices. This project includes a case study of the recent election of Mayor Karin Tome of Brunswick, Maryland.



PHOTO BY WOODS PIERCE

Project Advisor: James Gilman

Academic Advisors: James Gilman and Laura van Assendelft

Type of Project: Honors Thesis

Presentation Category: Delivered paper

Title: Timeless Leadership: Analyzing Plato's Philosopher King through Theories of the Modern Presidency

Abstract: Although we still value the same traits of honesty, integrity, thought, and education, the conception of the Philosopher King as described by Plato in *The Republic* has been thoroughly discarded from current concepts of political leadership in America. Modern theories of presidential leadership value traits that are at odds with those of the Philosopher King; as our concepts of knowledge have changed, so has our picture of ideal leadership. This is an important and interesting area of interdisciplinary study, as it provides a philosophical Archimedean point from which we can gauge the success of our own conception of leadership in the modern presidency and presidential politics.

Biography: Aubrey Sparks is a senior with majors in political science and philosophy and a minor in conflict resolution and peacemaking. Originally from Williamsport, Maryland, she plans to attend law school after her graduation from Mary Baldwin.

RILEY STEINER

Project and Academic Advisor: Janna Segal

Type of Project: Senior Project

Presentation Category: Performance or reading

Title: Pieces from *Three Tall Women* by Edward Albee

Abstract: In February 2013, Riley played the lead role in Edward Albee's Pulitzer Prize-winning play *Three Tall*

Women at Mary Baldwin College.

The project was Riley's senior thesis undertaking. The role of the 91-year-old autocrat was a tremendous challenge physically and emotionally but ultimately a deeply gratifying experience. The play's journey is one of acceptance and forgiveness.

Biography: Steiner has been a professional actor for 30 years. She played Ophelia in a New York production of *Hamlet* directed by Sir Anthony Hopkins and has numerous other credits, including television and commercial appearances, voice roles in Disney films, and a season on "General Hospital." Steiner is now pursuing her MFA in Shakespeare with plans to teach and direct theatre.



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KELSEY STILL

Project Advisor: Eileen Hinks

Academic Advisor: Steven Mosher

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Nursing Home Discharge Rates in Augusta and Rockingham Counties

Abstract: The threat of transfer or discharge from a nursing home can be both frightening and stressful for residents and their families. Too often, a facility may respond to resident's difficulties, increasing need for care, repeated questions, or complaints from family members by transferring or discharging the resident. The Federal Nursing Home Reform Law of 1987 was enacted to protect residents from unnecessary discharges. However, how have discharge trends changed since 1987? What are the rates of for-profit and nonprofit nursing home discharges in Augusta and Rockingham Counties? The objective of the study was to identify the rates of discharges in nonprofit and for-profit nursing homes in Augusta and Rockingham Counties. The research was conducted by interviewing six social workers in six nursing homes in Augusta and Rockingham Counties. The data reveal that nursing home residents are primarily discharged because the homes are unable to provide adequate care for the resident, and because a resident's health has improved to the point that he or she no longer needs nursing home care.

Biography: Kelsey Still is a health care administration major from Alderson, West Virginia. She served as the lead advocate on the Executive Committee of the Student Government Association and as the chairwoman of the President's Society. Next year she plans to enroll in a master's program for health care management at Virginia Commonwealth University.



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SOPHIA STONE

Project and Academic Advisor: Louise Freeman

Type of Project: Senior Project

Presentation Category: Poster

Title: An Investigation of Sexual Differentiation in the Asian Musk Shrew Medial Preoptic Area

Abstract: Sexual behaviors in most mammals are regulated in sexually dimorphic brain centers such as the medial preoptic area (mPOA) in the anterior hypothalamus. In rodents, neural aromatization of testosterone to estradiol during the perinatal period masculinizes both adult mounting behavior and the density of dendritic spines in the mPOA via COX-2 upregulation and activation of prostaglandin E2 (PGE2). Aromatization of androgens, however, is less important for brain masculinization in primates or in the Asian musk shrew (*Suncus murinus*). Instead, androgen receptor activation by testosterone or dihydrotestosterone appears necessary for masculinized sexual behavior. It is currently unknown whether the primate or shrew brain is masculinized via the COX-2-PGE2 axis or by a different mechanism. We investigated mPOA dendritic spine density via western blot analysis of spinophilin, a marker of dendritic spines, and direct quantification of dendritic spines by Golgi-Cox impregnation. A measured sex difference in mPOA dendritic spines will provide an anatomical marker of sexual differentiation in the musk shrew brain for evaluation of COX-2-PGE2 pathway involvement in brain masculinization.

Biography: Sophia Stone is a double major in psychology and biology with a biomedical emphasis from Pacific Palisades, California. Stone will participate in a research program at Oklahoma State University this summer and plans to continue her studies in a graduate program in biological sciences after graduating in 2014.



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JANET WEAKLEY

Project Advisor: Louise Freeman

Academic Advisor: Marion Ward

Type of Project: Senior Project

Presentation Category: Delivered paper

Title: A Mock Grant Proposal for Grace House

Abstract: Grace House is a Sober Living House in Shenandoah, Virginia for women in early recovery from alcohol and substance abuse. Research indicates that there is a positive relationship between success in early recovery and residence in sober living houses that encourage 12-Step programs, such as Narcotics Anonymous and Alcoholics Anonymous. A critical review of scholarly literature on the effects of sober living houses shows that practices at Grace House are consistent with the most effective



methods for maintaining abstinence and personal growth. Grace House is the only sober living house in the area and is currently at capacity with seven residents. With increased funding, Grace House could offer services to more women who need a safe environment to begin their recovery.

Biography: Janet Weakley is a psychology major from Harrisonburg. She works for the Harrisonburg/Rockingham Community Services Board as a residential advisor. She is on the board of directors at Grace House, Inc. and is a member of the recovery community.

SKY WHISONANT

Project Advisor: Joseph Sprangel

Academic Advisor: Janet Ewing

Type of Project: Senior Project

Presentation Category: Presentation with multi-media support

Title: Hush Day Spa, LLC

Abstract: This research investigated the business plan requirements for the start-up of Hush Day Spa, LLC to be located in St. Paul, Minnesota. The business plan covers the company overview; services to include massage spa treatments, manicures, pedicures, waxing, and facials; and products to include a variety of aromatherapy products. The research also describes the proposed marketing plan along with financial projections and a human resource plan.

Biography: Sky Whisonant is a business major with a minor in leadership from Orange, New Jersey, but she currently resides in Virginia Beach. Her future plans are to open Hush Day Spa, LLC, and other businesses. She also plans to attend graduate school for a dual MBA/JD degree.



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PHOTO BY JAN BRADSHAW

MAY TERM ABROAD CAPSTONE NOMINEES

The following students were nominated for the Capstone Festival but are unable to participate because they are on study abroad programs during May Term. We include their information here in recognition of their achievement and commitment to international awareness.

LINNEA BARKLUND

Project Advisor: Janna Segal

Academic Advisor: Terry Southerington

Type of Project: Senior Project

Title: *The Maids*: A Senior Directing Project

Abstract: Jean Genet's 1947 play *The Maids* shows the ritual of two sisters, Claire and Solange, who work as maids in Madame's home. Their ceremony entails taking on the role of Madame and fantasizing about killing her while fulfilling their own sexual desires. Barklund translated the script into English from the original French and directed the production. This project resulted in a deeper understanding of directing and design methods, specifically for Theatre of the Absurd; the history and theories of French theatre; translation for performance; and écriture féminine.

Biography: Linnea Barklund hails from Idaho Falls, Idaho. She is a theatre major with a minor in women's studies. Although still working on the chronology of events, Barklund plans to join the Peace Corps, go to graduate school, and pursue a career in acting, directing, and playwriting.

KATRINA BROUGHMAN

Project and Academic Advisor: Daniel Stuhlsatz

Type of Project: Senior Project

Title: Naturally Religious: Exploring Environmentalism as a New Religious Movement

Abstract: Environmentalism in our world today is diverse, international, and a major institution that is shaping social reality in the United States and elsewhere. It is so important in the lives of some individuals and groups that it can have features of a religion. For instance, it is not uncommon for the wilderness, the oceans, a species (e.g., redwoods), or a local stand of forest or stretch of desert to be considered "sacred" by a group of people. There are those who would consider the earth itself to be a sacred organism from which all life develops, as in the GAIA hypothesis (see Ruether 1995). The diversity of beliefs about the sacredness of the environment can be embodied in everyday actions, such as sacred rituals, and can form the normative basis of moral communities. To what extent, then, is current American environmentalism a new religious movement? This thesis takes up this question from a sociological perspective.

Biography: Katrina Broughman is a double major in English and sociology with a double minor in education and peacemaking and conflict resolution. She is from Rockbridge County, Virginia (Glasgow and Lexington). After graduation, she plans to student teach and to work as a secondary English teacher for approximately four years and then enter graduate school to study sociology, environmental issues, education, and/or communication, ideally in the western U.S. She would also like to join the Peace Corps and go to law school, as well as to get a Ph.D.



PHOTO BY IAN BRADSHAW

Congratulations to all students participating in the 2013 CAPSTONE FESTIVAL

Nomination to the Capstone Festival is in itself a high honor. To recognize extraordinary achievement, top honors will also be given in each presentation category (delivered papers; presentations with multi-media support; posters; and visual/audio-visual creations). Panels of three judges will evaluate the creativity, challenge, and execution of the projects as well as the ability of the presenters to communicate the content and significance of their work to a general audience. Top honors awards are accompanied by a cash prize of \$150.

