

Old Dominion University Undergraduate Research Symposium
Saturday, February 9, 2013
Learning Commons, Perry Library

Sessions at a Glance

8:00 -8:45 AM	Registration (Learning Commons, Northwest Atrium)
8:45-9:00 AM	Welcome and Opening Remarks (Learning Commons, Northwest Atrium): Dr. Carol Simpson, Provost and Vice President for Academic Affairs Old Dominion University, Old Dominion University
9:00-10:00 AM	Poster Session 1 (Learning Commons, Northwest Atrium, pg. 2-4) Featuring Political Science, Geology, Psychology
10:15-11:15 AM	Undergraduate Research in Biology: Aquatic. (Room 1310, pg. 5) Chair: Dr. David Gauthier, Department of Biological Sciences Innovative Computing in Engineering and Medicine I (Room, 1311, pg. 6) Chairs: Drs. Chung-Hao Chen, Khan Iftekharuddin, & Christian Zemlin, Department of Electrical and Computer Engineering The History of Medicine: Benefits Derived From Exploring the Sciences through the Lens of the Humanities (Room 1306, pg. 7) Chair: Dr. Annette Finley-Croswhite, Department of History
11:30-12:30	Undergraduate Research in Biology: Ticks (Room 1310, pg. 8) Chair: Dr. Holly Gaff, Department of Biological Sciences Innovative Computing in Engineering and Medicine II (Room 1311, pg. 9) Chairs: Drs. Khan Iftekharuddin, Dean Krusienski, & Jiang Li, Department of Electrical and Computer Engineering New Research in Renaissance and Baroque Art (Room 1306, pg. 10) Chair: Dr. Anne H. Muraoka, Department of Art History
12:45-1:45 PM	Luncheon: North Cafeteria, Webb Center (Sponsored by the Honors College)
2:00-3:00 PM	Undergraduate Research in Biology: Field Studies (Room 1310, pg. 11) Chair: Eric Walters, Department of Biological Sciences Facets of Experimental Physics at ODU (Room 1311, pg. 12) Chair: Dr. Stephen Bueltmann, Department of Physics New Research in Modern and Contemporary Art (Room 1306, pg. 12) Chair: Dr. Vic Colaizzi, Department of Art History
3:00-4:30 PM	Reception (Learning Commons, Northwest Atrium) Poster Session 2 (Learning Commons, Northwest Atrium, pg. 14-16) Featuring Engineering, Kinematics, Interdisciplinary Social Sciences Undergraduate Visual Arts Exhibit (Learning Commons, Northwest Atrium, pg. 17)

Learning Commons Map

9:00-10:00

(Learning Commons: Northwest Atrium) Poster Session 1

1) Study Abroad: The Real Motivations for the Pursuit of an International Experience

By Nathaniel Arnold (Mentor: Dr. Kathleen Winters)

Political Science

This project is a well-structured, multi-faceted glimpse at the practical drawbacks of study abroad, and examines in a straightforward manner the limitations that face modern students who are interested in studying abroad. Through survey results collected from current ODU undergraduates, fiscal issues, family obligations, and limited contact with home and college campus are all shown to be essential factors in a student's decision whether or not to study abroad.

2) What Affects Young People Who Voted for Obama in 2008 to Change Their Vote in 2012?

By Tara E. Chang (Mentor: Dr. Kathleen Winters)

Political Science

This research project explores why young people who voted for Obama in 2008 changed their vote in 2012 or did not vote. By looking at the 22-30 age group the research will involve different subjects, such as researching how the youth received information about their candidate of choice while also researching the range of enthusiasm towards a candidate. I define young people as 22 to 30 because this age group was more likely to vote in both elections and as they got older their ideas and thinking may have changed. This hypothesis is important to look at because this age group created the most enthusiasm and energy for Obama in both elections.

3) The Importance of a Bottom-up Approach in Crafting Policy Involving Firearms on College Campuses

By Rachel Williams (Mentor: Dr. Kathleen Winters)

Political Science

This project will use previous literature to propose several benefits of employing the bottom-up approach when creating policy. A survey will be administered in order to gain a better perspective on how Old Dominion students feel about allowing firearms on campus. The survey results will also relay whether ODU students support the policy position that Virginia has taken. In addition to gaining insight into student opinion, the variables used in the survey will offer an outlook into what shapes students' attitudes on this issue.

4) Does Age Influence Voter Turnout?

By I'Esha Wynn (Mentor: Dr. Jesse Richman)

Political Science

Age has often been a major indication when describing voter turnout in the past. However, in this research design the effect of whether age directly impacted voter turnout or did other exterior factors such as income, education, or geographical location have a larger impact on voting behavior. All these factors were measured based on data retrieve from the 2008 U.S. Census Current Population Survey. This data was used to measure the correlation between the variables and voter turnout.

5) Why Do Some People Stay Homeless and Others Do Not?

By Christina Brady (Mentor: Dr. Jesse Richman)

Political Science

Being homeless is often an issue of being on the streets, returning to a home, then going back to the streets. What factors make it more likely for a person to return to housing and safely stay in housing? This research focuses on finding what factors, services, and programs make people more likely to keep themselves off the streets. Examination methods include examining the funding and general availability of certain programs and comparing them to the amount of homeless people in the local area, surveying general satisfaction with programs, and looking for gaps in awareness and weaknesses in otherwise effective programs so that the report not only examines the core problem, but potential solutions for improving effectiveness.

6) What Affects Stability in Voting Habits

By Robert Potter (Mentor: Drs. Kathleen Winters & Jesse Richman)

Political Science

Although many studies and polls have been done about what causes people to vote in particular ways, there is little research on voting stability. What affects stability in voting habits? Why do some people vote for the same party every time, and others switch frequently? I examine the influence of the media, party ideology, peer pressure, and family.

7) Legislation's Effects on Gun Violence

By Nathaniel Brown (Mentor: Dr. Jesse Richman)

Political Science

In the United States there is profound issue with gun violence. Over the past 18 months the mass shootings that have occurred have sparked public outrage and have brought gun control back to the forefront of mainstream media. Despite the vast amounts of research that this subject has produced, little has been done as a result of these studies. In other studies that were conducted in years past, topics such as suicide and interest groups were left out of the results. This study changes things and looks at different variables as an explanation for this violence that persists. This study has found that while legislation alone does not deter violence, the larger implications focus on a need for different types of legislation as well as enforcement of these laws.

8) Does Felon Disenfranchisement Reduce Voter Turnout?

By Amber Pitzen (Mentor: Dr. Jesse Richman)

Political Science

This research project focused on determining the effects of felon disenfranchisement laws on voter turnout rates. I rank state laws according to the severity of voter disenfranchisement. Additional data is accessed from the Department of Justice Statistics in order to calculate the number of ex-felons and from the Current Population Survey to determine voter turnout rates in National Elections. Results indicate that states with more severe felon disenfranchisement laws have lower voter turnout rates than states with less severe felon disenfranchisement laws.

9) Creation of Virtual Geological Specimens for Viewing in Google Earth Using AutoDesk 123D Catch Technology

By Melissa Bateman, Mary Martin,

& Dr. Declan De Paor (Mentor)

Geology

Moving courses on-line presents a problem for subjects such as geology that require students to study specimens of rocks, minerals, fossils, etc. In the past, instructors in distance education courses sometimes mailed samples out to their students or arranged for occasional onsite labs but both approaches have their problems. In the Geospatial Visualization research group at ODU, we are working to create virtual specimens. These models, once complete, will be entered into the Google Earth database for geologists and students across the globe to use. Previous undergraduate research students used a 3D laser scanner to create models but that is expensive and time-consuming. Using the AutoDesk 123D-Catch program to make three dimensional models of samples, the team has been manipulating the images to get the most detail available. We are currently working with mantle rocks sent to us from a colleague in Hawai'i. These are particularly good for teaching on-line as few students ever see mantle specimens in real life. Furthermore, these rocks will be destroyed in geochemical analyses so the virtual specimens serve as an archive. This research is supported by NSF grants 1022755 and 1034643.

10) Lake Ballard Phosphate and Grain Size Comparisons at the Sediment-Water Interface

By Amanda Antosh, Daniel Christian, Rick Goshen, Jessi Strand, & Regan Thomas (Mentor: Dr. Fred Dobbs)

Ocean, Earth, and Atmospheric Sciences

Lake Ballard is a man-made lake in Portsmouth Virginia, and the site of our phosphate concentration and granulometry study. Knowing the amount of Phosphate in the lake is important because, phosphate is a limiting nutrient controlling the plankton population. To look at part of the phosphate cycle we concentrated on the sediment at the sediment-water interface.

Phosphate is predicted to bind better to smaller sediments due to the sediment's chemical composition. We hypothesized higher concentrations of phosphate would be present with smaller grain size. Using core and grab sampling methods we extracted sediment from the sediment-water interface. We then tested the phosphate concentrations using a Spectrophotometer and the mean grain size using the Malvern 2000g. We found no significant correlation between grain size and phosphate concentration. Further statistical analysis and phosphate studies on Lake Ballard will be necessary to confirm our findings.

11) Effects of Two Hurricanes on Groundwater Flow and Salinity at Lake Ballard

By Micheal Hall, Robert Hiza, Robert Murray, & William Perry (Mentor: Dr. Fred Dobbs)

Ocean, Earth, and Atmospheric Sciences

Lake Ballard is an anthropogenic lake located in Portsmouth, VA at the Hoffer Creek Wildlife Preserve. In the summer of 2011, groundwater flow around the lake was drastically altered by Hurricane Irene. Following the storm, Segar (2012) calculated the time needed for groundwater flow to return to pre-Irene conditions. Using Darcy's Law as well as average and linear flow rates, Segar (2012) estimated it would take eight months for groundwater flow directions and rates around Lake Ballard to return to pre-storm behavior given average precipitation conditions. However, because of the wet summer in 2012, we hypothesized groundwater flow would not return to pre-Irene conditions in only eight months. Using depth-to-water measurements and elevation values taken at numerous wells around Lake Ballard, we calculated and mapped hydraulic heads to generate a groundwater contour map describing the flow. Additionally, conductivity and pH values from lake and well water reflect the long-term flow patterns around the lake. These groundwater flow and water quality data gathered around Lake Ballard support our hypothesis. In October 2012 Hurricane Sandy altered the groundwater flow pattern around Lake Ballard again. Sandy provided a unique opportunity to compare the effects of two hurricanes on Lake Ballard. Data revealed the degree of groundwater flow and water quality dynamics between the lake and the nearby tidal creek during and after the storm surge events. Historical information with water quality data revealed anomalies that highlight the complexity of the freshwater/saltwater interface at the lake. Studying the effects of hurricanes on groundwater flow and water quality in a coastal environment such as Lake Ballard may establish a better understanding of how sea level rise and salt water intrusion may affect coastal areas in the future.

12) Similarities and Differences between First Generation and Continuing Generation College Students

By Dante Myers, Heather Bolen,

& Dr. Debra Major (Mentor)

Psychology

With the differences seen in first-generation college students (FGS) compared to continuing-generation college students (CGS) it is possible that there are also differences in coping self-efficacy, major commitment, and capitalization between the groups. The sample consisted of 537 STEM majors from two southeastern universities (88 women, 449 men, $M_{age} = 20.08$, $SD = 4.195$). There were four hypotheses in this study that looked at differences in academic performance, coping self-efficacy, major commitment, and capitalization between the two groups. An archival database from a separate larger study was used to assess the differences. The results indicated that there were no significant differences between groups in grade point average, coping self-efficacy, major commitment, capitalization interests, or capitalization self-efficacy. The results also indicated that FGS intended to capitalize and acted on their capitalization intentions more so than CGS. These STEM major FGS intending to capitalize and acting on these intentions may explain why there is no significant difference in grade point average between the two groups. This research provides suggestions for future research to either replicate or build on the current study.

13) The Effects of the Knowledge of Positive Marginality on Women in STEM Majors

By Lauren Mahan, Dr. Valerie Morganson & Kristina Bauer (Mentor: Dr. Debra Major)

Psychology

Women are extremely underrepresented in the STEM (Science, Technology, Engineering, and Mathematics) fields. The purpose of this study is to test an attitude-based training intervention that inoculates STEM women against barriers using positive marginality as a framework. Positive marginality supposes that being in a socially marginalized position can be a source of strength, vibrancy, and radical possibility (Hall & Fine, 2005). Unlike past research that has focused primarily on the disadvantages of being in the social margin, this study contributes to the literature by focusing on the advantages. The sample consisted of thirty-six women in the Computer Science and Engineering majors at two southeastern universities. A survey served as a pre-test/post-test for our study, with an intervention (i.e., a positive marginality training video) in between the two surveys. Dependent samples t-tests were used to determine if there were any significant differences between pre- and post-tests on several outcomes (i.e., knowledge, major satisfaction, affective commitment, continuance commitment, major involvement, career identity, persistence intentions, positive marginality, and coping self-efficacy). In partial support of the hypotheses, we found that coping self-efficacy (i.e., a person's subjective appraisal of his/her ability to cope with the environmental demands of a stressful situation) was significantly higher after training ($M = 3.92$, $SD = .76$) than before ($M = 3.38$, $SD = .61$). Limitations of this study include small sample size and low reliability. Further research is needed to investigate positive marginality in STEM women.

10:15-11:15 AM (Learning Commons, 1310)
Undergraduate Research in Biology: Aquatic
Chair: Dr. David Gauthier, Department of Biological Sciences

Experimental Oral Transmission of *Mycobacterium shottsii* and *M. pseudoshottsii* to Chesapeake Bay Striped Bass (*Morone saxatilis*)

By Brittany St.Jacques, Ashley Moye, Brandon Rowan (Mentor: Dr. David Gauthier)

The bacterial disease, mycobacteriosis, is present in Chesapeake Bay striped bass (*Morone saxatilis*) at high endemic levels. Mycobacteria isolated from these fish are predominantly two novel species: *Mycobacterium pseudoshottsii* and *M. shottsii*. Despite a century of research on finfish mycobacteriosis, only one paper has demonstrated transmission by biologically relevant exposure routes, while other accounts remain anecdotal. This work examined experimental oral transmission of *M. pseudoshottsii* and *M. shottsii* to striped bass, via amended gel-based feed. *M. pseudoshottsii* was recovered from spleens of 10% of exposed striped bass, indicating that ingestion is a viable natural transmission mode for this pathogen.

Studying the Oral Route of Transmission for *Mycobacterium marinum* to *Danio rerio*

By Ashley Moye, Brittany St.Jacques, Brandon Rowan (Mentor: Dr. David Gauthier)

The route of transmission of pathogenic *Mycobacterium* spp. to fishes is not well understood. The suggested routes of transmission include: ingesting prey infected with *Mycobacterium* spp.; direct contact; or aqueous exposure via the skin, gills or intestine. The purpose of this study was to investigate the oral exposure route by inoculating a gelatin-based food with two doses of *Mycobacterium marinum* (1218R) and feeding to the model species, *Danio rerio* (zebrafish), over a period of four weeks. Mycobacterial presence in internal organs was determined by qPCR and bacteriology. Preliminary results suggest that *Danio rerio* are refractory to oral infection with *Mycobacterium marinum*.

Marine Species Distribution and Spatial Analysis – Applications in Marine Conservation

By Angela Goodpaster (Mentors: Drs. Heather Harwell and Kent Carpenter)

The Global Marine Species Assessment, headquartered at ODU, is a unit of the Species Programme of the International Union for Conservation of Nature. The GMSA is compiling into a database global and regional distribution ranges of marine species that are reviewed by a network of scientists. Spatial analyses from these species distributions reveal patterns of species richness, concentrations of threats and threatened species and gaps in coverage of marine protected areas related to threatened species. These geospatial data can then be used to create awareness of conservation needs and influence conservation policy.

A review of the Indo-Pacific *Canthigaster solandri* complex

By Emilie Stump (Mentors: Drs. Heather Harwell and Kent Carpenter)

Canthigaster solandri was considered to be among the most widespread and variable members of the genus *Canthigaster* (the sharpnose pufferfishes), with a distribution extending from East Africa to the Hawaiian Islands. Genetic and morphological evidence support the existence of three species in the *C. solandri* complex: *C. solandri* Richardson 1845, *C. papua* Bleeker 1848, and *C. petersii* Bianconi 1850, which we resurrect as a valid Indian Ocean species based on divergence in the CO1 gene. While a substantial amount of intra-specific variation in coloration is observable within *C. solandri*, *C. papua*, and *C. petersii*, a combination of color characters can be used to reliably separate these species.

10:15-11:15 AM (Room, 1311)

Innovative Computing in Engineering and Medicine I

**Chairs: Drs. Chung-Hao Chen, Khan Iftekharuddin, & Christian Zemlin,
Department of Electrical and Computer Engineering**

Computer-Controlled Life-Support System for Cardiac Tissue,

By Mostafa Awwad

Cardiac Arrhythmias are a major cause of death. The main tool to find new therapies is experimentation with explanted animal hearts. Data that come from such experiments are reliable only if the hearts are kept in an environment that closely resembles that inside the body. Important environmental parameters are the temperature, flow rate, and pressure of the blood supply, and the temperature of the surrounding fluid. In this project, we developed a system that measures these quantities, automatically acts to keep them within the required ranges, and emits warnings when any quantity cannot be kept within its required range.

Tumor Detection in Mammography Image Analysis

By Michael Chatman

Mammography images are widely used for early detection and prevention of breast cancer. Mammograms are low dose x-rays that are used to mostly examine the breasts of mostly women. The research that we are conducting entails the analysis of vast amount of mammography images to determine if cancerous materials exist in a patient's image or not. The method of our analysis would be by tumor detection and then segmentation. The method of segmentation is done the use of fractal analysis to map where the cancer exists in our indicated region of interest.

The Utilization of Video Face Replacement Technology (VFRT) for Routine Clinical Procedures in Children with Autism Spectrum Disorder (ASD)

By Victor Habgood

Since the prevalence of Autism Spectrum Disorders (ASDs) is on the rise, it is increasingly important to examine ways to help reduce deficits in behavior for children with ASD in clinical settings. Researcher created Video Face-Replacement Technology (VFRT) will consist of a DVD for the child with ASD to view before routine healthcare visits and will incorporate the child and clinical healthcare provider's (- e.g. dental hygienist, nurse, and nurse practitioner) actual face and clinical environment. Unlike current unrealistic commercially created or animated systems, innovative VFRT will imbed the child and CHP's lifelike facial expression, skin pigmentation and head position. Children will be able to view the video prior to the healthcare visit to overcome fear and anxieties leading to inappropriate behaviors in children with ASD within clinical settings.

10:15-11:15 AM (Room, 1306)

**The History of Medicine: Benefits Derived From Exploring the Sciences through the
Lens of the Humanities**

**Chair Dr. Annette Finley-Croswhite
Department of History**

Medicine as a science is usually focused on the diagnosis and treatment of diseases and medical conditions. But medicine and disease also have histories that not only unit the sciences and the humanities but also offer critical perspective on contemporary health problems and their relation to societies, past and present. This panel attempts to break down the barriers between biology, psychology, technology, and history as disciplines by focusing on the history of amputation, childbirth, dentistry, mental conditions, and disease.

Panel Topics and Presenters

Preterm Labor and Delivery in Time.

Jordyn Armstrong, Health Sciences

The History of Amputation and the Progression to the Perfect Prosthetic

Oliver Borden, History

From Toothworms to Caries: A Brief History of Oral Disease and the Evolution of Dentistry

Rachel Casey, History

Modern Medicine Meets Ancient Anxiety: Obsessive-Compulsive Disorder”

Allison Gunn, History

Medical Mystery: English Sweating Sickness

Janet Hakki, History

Tuberculosis: From Consumption to TB

Wayne Rudolph, Environmental Health

11:30 AM – 12:30 PM (Room 1310)
Undergraduate Research in Biology: Ticks
Chair: Dr. Holly Gaff, Department of Biological Sciences

Phylogeography of *Ixodes affinis* ticks

By Mindy Marshall (Mentors: Drs. Holly Gaff and David Gauthier)

Ticks transmit the greatest variety of pathogens of any known arthropod vector of disease. Several ticks are of particular interest because they carry pathogens that cause human disease, including *Ixodes affinis* Neuman. *I. affinis* is a hard-bodied (ixodid) tick known to be a competent vector for *Borrelia burgdorferi*, the agent of Lyme disease, and agents of other human diseases, such as *Borrelia bissettii*. This study was completed to discover phylogeographic patterns of *I. affinis* distribution. A phylogeographic study was performed on 77 the individual *Ixodes affinis* from 5 different populations. Populations were sampled from Cheatham Annex, VA, Damn Neck, VA, Beaufort County, NC, and Bulloch County, GA. Three distinct haplotypes were found. One haplotype from Beaufort County, NC was completely unique. In order to generate a clear geographic pattern of *I. affinis*, more samples are to be sequenced and analyzed.

Differentiation of *Ixodes scapularis* and *Ixodes affinis* from Virginia tick collections

By Breanna White and Chelsea Wright (Mentors: Drs. Holly Gaff and David Gauthier)

Ixodes scapularis and *Ixodes affinis* are two common ixodid ticks found in Virginia and surrounding areas. Differentiation between these two morphologically similar species is vital to understanding tick-human interactions, as well as further expansion in the ranges of these vectors. This study will utilize a quantitative PCR assay to differentiate *I. affinis* from *I. scapularis*, and compare these identifications to those made on morphological grounds.

Exploring the innate immune system in *Amblyomma maculatum*: identification of the hemocyte defensin gene

By Nicole Cox (Mentors: Drs. Daniel Sonenshine and Wayne Hynes)

Defensins are a group of immunopeptides common to arthropods, as well as other eukaryotic organisms (plants to humans). The function of these immunoproteins is to lyse microbial cells, by forming channels in cell membranes (Hynes et al 2008). In light of the risks tick-borne pathogens present to humans, understanding the role of ticks' innate immune system is important to eventually controlling the spread of these disease-causing agents. The purpose of this study is to identify the sequence for the major defensin found in the hemocytes of *Amblyomma maculatum* (Gulf Coast Tick).

Enhancing tick field collection methods to attract *Ixodes scapularis*, *Ixodes affinis*, and *Amblyomma maculatum*

By Amy Johnson and Joseph Brown (Mentors: Drs. Daniel Sonenshine and Holly Gaff)

Tick surveillance was conducted in the Hampton Roads areas to study the spread of tick-borne diseases and the movement of tick species throughout the state. The previous methods used for tick collection, flagging and collection from hosts, are very time and labor intensive, and may be biased to the more aggressive tick species. This study aimed to devise a more efficient method of collecting all tick species. Our field sites are dominated by *Amblyomma americanum*, Lone star ticks, but this may be due to their behavioral differences with other species of ticks as Lone stars are known to be exceptionally aggressive in pursuing their hosts. Experimental collection techniques were tested at two different sites adjacent to sites of the surveillance project. We modified standard techniques in order to simulate the host animal of choice of the target species. At the first site, a rural area adjacent to the Great Dismal Swamp, our survey found the greatest diversity in tick species. Using a combination of different attractants on the flags, pheromones and CO₂ traps, and a CO₂ flag system, we hoped to improve the probability of collecting other species such as *Ixodes scapularis*, *Ixodes affinis*, and *Amblyomma maculatum*. At the second site, a urban park located in Portsmouth, we used a variety of semiochemicals to attract *Ixodes scapularis* and *Ixodes affinis*.

11:30 AM – 12:30 PM (Room 1311)
Innovative Computing in Engineering and Medicine II
Chairs: Drs. Khan Iftekharuddin & Jiang Li,
Department of Electrical and Computer Engineering

PTSD Patients Monitoring and Diagnosis Using Voice Features

By Andrew Le

Measuring stress levels as reflected in the voice signal has the potential for automatic diagnosis of mental related diseases such as posttraumatic stress disorder (PTSD). Past research has shown that several prominent features of speaking behavior and voice sound characteristics are closely related to the severity of patients' mental illness as well as the depression recovery time course. In this project, we propose to apply advanced feature extraction techniques and a recently developed machine learning algorithm, Random forest, to extract reliable and effective voice features for PTSD diagnosis and for emotion recognition.

Expansion of Mind-Controlled Robotic Arm Applications and Lab Demonstrations

By Benjamin McDermott

Brain-computer interfacing (BCI) is a technology that allows a human to control a computer by manipulating the electrical activity of his/her mind. Although this communication system has proven to be effective in numerous biomedical applications, many avenues have not been explored that could potentially increase its capabilities. This project focuses on elucidating practical applications for the physically disabled and novel lab demonstrations of core concepts through an attempt to merge BCI with Computer Vision, another research area that has also demonstrated enormous potential in various applications. By merging the two, a system with unique advantages can be realized that could possibly increase the versatility or efficiency of implementing BCI.

Statistical Characterization of EEG Event-Related Potentials after Single-Bit Amplitude Quantization

By George Micros

A brain-computer interface (BCI) is a device that allows severely disabled individuals to communicate and interact with their environments using brain activity. Event-related potentials (ERP) are a class of the most researched EEG signals for BCI communication. It has recently been shown that an ERP-based BCI is still highly effective following significantly reduced amplitude quantization of EEG signals, even to single-bit resolution. This research examines the statistical properties and relationships of the drastically simplified binary spatio-temporal EEG ERPs.

11:30 AM – 12:30 PM

New Research in Renaissance and Baroque Art (Room 1306)

Chair: Dr. Anne H. Muraoka, Department of Art History

Depictions of the Last Judgment in Northern Renaissance Art

By ABIGAIL JOHNSON (Mentor: Agnieszka Whelan)

Marx Reichlich's Last Judgment has an interesting pictorial description of demons. With the contrast of Rogier Van der Weyden's and Hans Memling's Last Judgment works, the distortion of the demons in Reichlich's piece seems odd. Within the invention of the printing press, around fifty years before Reichlich's work, the influx of old traditions and folklore imagery helped shape Reichlich's view on demons. Biblical references aid his depictions as well as the symbolic meanings of certain animalia found in his creatures. The composite nature of his demons is a direct connection to the new widespread interest of renewal.

MICHELANGELO: The Male Religious Nudes

By KIMBERLY GAY, (Mentor: Dr. Anne H. Muraoka)

During his lifetime, Michelangelo was the master of the human body. Many of Michelangelo's religious works, both in sculpture and painting, display nude figures. Because most of his nude figures are male, Michelangelo's sexual orientation has captured the minds and imaginations of art historians, critics, and students alike, and as a result, has clouded the meaning and function of his nudes. This paper will cast aside these speculations in order to consider the beauty of the figures that he created as a reflection of his deep faith.

The Teachings, Collaborators, and Influences of Hendrick de Clerck and His Venus and Adonis

By SARAH MCLAIN (Mentor: Agnieszka Whelan)

Painted in 1600 by Hendrick de Clerck, Venus and Adonis include several characteristics of the Mannerist style. De Clerck, however, was not just influenced by the style. Although he was native to Brussels, de Clerck had no difficulty in branching out. Hendrick de Clerck learned from, worked with, and was influenced by a number of artists including Martin de Vos, Joos van Winghe, Wenceslas Cobergher, Denjs van Alsloot, and Titian. The skills learned from these artists combined with de Clerck's own style molded him into an artist that brought Venus and Adonis.

Stylistic Indecencies of Michelangelo Merisi da Caravaggio

By GEORGIA HARRELL (Mentor: Dr. Anne H. Muraoka)

Caravaggio's religious works were met with much controversy due to their blatant realism. They typically exuded disregard for reform guidelines for religious art, which were set forth by the Church in the Council of Trent and stringently upheld by Clement VIII. This paper will assess the early influences on Caravaggio before his arrival in Rome and their effect on his religious works. I will postulate that the unsettling, atypical depiction of the Repentant Magdalen was motivated by Caravaggio's efforts to develop his characteristic style despite the religious precepts in Rome during the sixteenth century.

Identifying the Baptist: The Enigma of Caravaggio's Youth with a Ram

By BIANCA RAWLINGS (Dr. Anne H. Muraoka)

The Capitoline Youth with a Ram is the most problematic painting of Caravaggio's entire career. The identity of the youth in the painting has been a question among scholars and the artist's contemporaries for centuries. Through intensive research, I have sought to quell the unrest that surrounds the piece. In my paper, I will answer the questions surrounding the painting, including the identification of the figure in the image as St. John the Baptist, and also decipher the meaning of the ram as a metaphor for both the Baptist's sexual maturity and his rejection of the Jewish faith.

2:00-3:00 PM (Room 1310)

Undergraduate Research in Biology: Field Studies
Chair: Dr. Eric Walters, Department of Biological Sciences

Reducing the risk of ehrlichiosis at Hoffer Creek Wildlife Preserve

By Yong Suk Ko and John Warfle (Mentor: Dr. Holly Gaff)

The purpose of this research was to reduce the incidence of human monocytic ehrlichiosis (*Ehrlichia chaffeensis*) transmission from *Amblyomma americanum*, Lone star tick, to humans at Hoffer Creek Wildlife Preserve; an urban park. The project was part of an active tick surveillance project that had been flagging for ticks weekly at a variety of locations in the Hampton Roads area since 2009. The first phase of this project used a motion-activated, infrared camera to identify the abundance of known preferred host species such as white-tailed deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), etc., and the areas most frequently used by these hosts. Using this information and a map of the preserve, a simulation model was created based on a published agent-based model for ehrlichiosis. Using this simulation, locations for control measures were determined. In the second phase we built host-targeted acaricide applicator systems to target species indicated as the likely host of the infected ticks. These systems were deployed at the locations identified by our model. Surveillance continued in the reserve in order to assess the impact of these systems and compare with predicted model results.

An inventory of vegetation in a successional, forested wetland, southeastern Virginia

By Caitlin Sciulli and Jana Eggleston (Mentor: Dr. Holly Gaff)

The Stephens tract is site that is a part of The Nature Conservancy Stewardship of lands adjacent to the Great Dismal Swamp National Wildlife Refuge, a part of a greater wetland habitat restoration plan as a solution to habitat fragmentation. In 2003, TNC began the vegetative restoration of Stephens by planting *Taxodium distichum* (bald cypress) and *Platanus occidentalis* (American sycamore) trees, altering drainage, and allowing both mammalian and vegetative succession to progress. In 2005, a 1ha research grid was established to monitor the herbivorous small mammal community. The objectives of this study were to inventory the vegetation, map the dominant herbaceous species and begin determining the woodiness of the established grid. We collected, identified and prepared voucher specimens from the 1ha site, creating a master inventory. Our results show that the dominant species required by mammalian herbivores, such as *Aster* spp. (*Symphotrichium* spp.), *Juncus* spp., *Solidago* spp., *Rubus*, and assorted trees, are widespread on the site. Future work will include the completion of the measuring of all tree diameters and the determination of percent woodiness by species for correlation with the occurrence of small mammals on the site.

Vegetation and Tick Populations in Hampton Roads

By David Cutherell (Mentor: Dr. Holly Gaff)

While the distribution of ticks in a given geographic area tends to be very patchy and related to host populations, soil moisture, vegetation type, weather conditions, and other factors, the relationship between tick species and abundance, and habitat, is not well understood. A tick surveillance project has been running in the Hampton Roads area since 2009 with weekly data collection at set transect areas. In order to better understand the relationship between habitat and tick populations, these areas in will be mapped and the dominant vegetation type assessed. A relationship between vegetation type and tick species and numbers could help identify areas where ticks are most likely to be found, as well as where particular species are likely to move in the future.

Enrichment of Captive Squirrel Monkeys at the Virginia Zoo

By LaCheryl Ball (Mentor: Dr. Eric Walters)

Food enrichment is a technique used by the zoo industry to promote overall wellness of animals in captivity. I measured responses of captive squirrel monkeys to food enrichment at the Virginia Zoo. The research involved determining pre-treatment activity levels in order to test the effect of food enrichment on post-treatment activity levels. I hypothesized that feeding and active behaviors would increase as a result of food enrichment. Introduction of food enrichment resulted in a 15% increase in feeding behaviors, an 11% decrease in sedentary behaviors, and a 4% increase in active behaviors. In conclusion, food enrichment was a successful method of increasing activity in captive squirrel monkeys and has important implications for increased health and well-being of captive primates.

2:00-3:00 PM (Room 1311)
Facets of Experimental Physics at ODU
Chair: Dr. Stephen Bueltmann, Department of Physics

A Solid Polarized Target for CLAS12 at Jefferson Lab

By Sean Averill (Advisor: Dr. Stephen Bueltmann)

To be able to study the spin-dependence of the nucleon structure with electron scattering experiments, targets providing spin-polarized nuclei are needed. We report on the development of a new solid polarized target for the CLAS12 detector presently being installed in Jefferson Lab's Hall B. The talk will emphasize the polarization measurement of proton and deuterons with the nuclear magnetic resonance (NMR) technique.

Detecting and Observing Extrasolar Planet Dynamics

By Brian Brooks (Advisor: Dr. Stephen Bueltmann)

The search for extrasolar planets has resulted in an increasing number of discoveries in the past decade. Using the 24" robotic telescope on Fan Mountain (Virginia) and the IRAF analysis package, we can measure light curves of star with their transiting exoplanets. We measured and analyzed several transits of the exoplanet Qatar-1b with a transit period of 1.42 days. The system consist of a K type dwarf star orbited by a nearby giant gas planet. In combination with other amateur observations, we detect a decreasing occurrence of the mid-transit, indicating a decreasing radial orbit.

A MOTley Project: Building a Laser Lock, a Glass Cell, and a Vacuum Chamber for Obtaining a Rubidium Magneto-Optical Trap (MOT)

By Dawn Hedges (Advisor: Dr. William Williams)

Laser cooling and trapping of atoms is accomplished in a Magneto Optical Trap (MOT). The goal of this project was to set up the equipment necessary for obtaining a MOT. Each of the four phases had its challenges, but the lock was successful, the optics were set up, and the glass cell was constructed and mounted to the chamber. Future work to obtain a MOT includes fixing the ion pump, constructing new magnetic field coils, and an improvement to the DAVLL apparatus.

Remote Sensing With Continuous Wave Laser Light

By Eric Ingram (Advisors: Dr. Charles Sukenik and Dr. William Williams)

This project focuses on using a continuous wave (CW) laser to make a remote sensing light detection and ranging (LIDAR) apparatus. The project involves using phase modulation to put frequency sidebands on a continuous wave laser and from the evolution of that beam, determine the distance the laser beam travelled. One important feature is that it has a particular application in oceanography, due to the shorter distances covered. The end goal of this project is to develop a cheaper, more compact, and more readily useable LIDAR system to replace the expensive and bulky pulse laser systems used today.

Drift Chamber Detectors for CLAS12 at Jefferson Lab

By Christian Wooten (Advisor: Dr. Lawrence Weinstein)

The energy upgrade at Jefferson Lab requires the construction of a new CLAS12 detector for Hall B. For momentum reconstruction of the scattered particles, three different size regions of drift chambers will be placed inside a toroidal magnetic field. At ODU, the medium-sized drift chambers, equilateral triangles of ~2 m side length, have been built and tested under cleanroom conditions. An overview of the design, construction, testing and future use will be given. Need projector and computer.

2:00-3:00 PM (Room 1306)
New Research in Modern and Contemporary Art
Chair: Dr. Vic Colaizzi, Department of Art History

Fragonard's Return to Noble Status

By CATHLEEN NEALON (Mentor: Dr. Robert Wojtowicz)

Jean-Honoré Fragonard's *Progress of Love* was painted in 1771, but it has only been available for public viewing at New York's Frick Collection since 1935. A romantic series conceived for the walls of a French hôtel, *The Progress of Love* was removed shortly after its completion and remained in obscurity until acquired by financier J.P. Morgan and subsequently by industrialist Henry Clay Frick. This paper will analyze how the reinstallation of the series in the United States helped to restore Fragonard's reputation as a master artist.

Despicable Grace: The Shifting Legacy of Angelica Kauffman

By CELIA BROWNING (Mentor: Dr. Vic Colaizzi)

In the centuries following Neoclassical painter Angelica Kauffman's death, critics stopped using the terms with which her work is almost always described—words that also relate to Kauffman's personality, like 'charming,' 'gentle,' and 'ambitious'—in a positive light, and instead began pointing to them as evidence of Kauffman's artistic failures. This paper explores the degree to which Kauffman's gender impacted this shift in critical opinion, and argues that while Kauffman lost control of her legacy after her passing, she possessed a greater command over contemporary perceptions of her work than most scholars suppose.

Marina Abramović: Questioning Liberty

By ANNA PATRICIA M. TOBIAS (Mentor: Dr. Vic Colaizzi)

Marina Abramović, a Serbian-born and New York-based artist, uses her body as her medium. Her performances are tests of mental and physical endurance that involve placing herself in extreme and painful situations, allowing her to explore the consciousness and to use it to surpass the limits of the body. Audience participation is vital since it fuels the performance and illuminates aspects of society. Although her works have been associated with feminism, they use gender in order to ask broader questions about the validity of rights and the very notion of liberation.

Ghada Amer's Contributions to Contemporary Third Wave Feminist Dialogue

By CHELI SCOTT (Mentor: Dr. Vic Colaizzi)

Ghada Amer has had an extensive career of solo and group exhibitions, special projects, and books. This paper will focus on Amer's most critically well-known works: her embroidered canvases. Amer's work is in dialogue with the contemporary third wave feminist movement because she believes that the woman's body is intended to be under her individual control to be used as a powerful, seductive entity. Amer attests that the subject matter of her work is born from her experience with sexuality and confronting challenges with cultural hybridity. Amer's canvases utilize sexual imagery in effort to challenge the viewer, establish her own agency, and reclaim power.

Exploring Mario Botta's Ethics of Building in the San Francisco Museum of Modern Art

By ANNA WAGNER (Mentor: Dr. Robert Wojtowicz)

The Swiss architect Mario Botta wrote *The Ethics of Building* in 1997. In it he wrote, "Whenever I design a house, a school, a church, a bridge, or a theatre, I design a part of the city, a space whose *raison d'être* lies in the complexity and interactivity of its configuration." Mario Botta designs all of his work to fit into the surrounding city or nature and his creativity can be seen in all of his works including his first design in the United States, The San Francisco Museum of Modern Art.

3:00-4:30 PM
(Learning Commons: Northwest Atrium)
Poster Session 2

1) Growth of ZnO Nanorods by Hydrothermal Method

By Sushil Khadka (Mentor: Dr. Helmut Baumgart)

Electrical Engineering

ZnO nanostructures are very attractive for high-efficiency short-wavelength optoelectronic nanodevices owing to their wide band-gap (3.37 eV) with large excitonic binding energy (≈ 60 meV), high mechanical and thermal stabilities, good electrical conductivity while being optically transparent and piezoelectricity. Growth of various one-dimensional (1D) ZnO nanostructures, such as nanorods, nanowires and nanobelts has been reported using various growth methods. However, it is still a significant challenge to obtain controllable growth of ordered nanorods for specific device applications, such as in solar cells, nano-lasers, optical storage, nanoscale heterojunctions, sensors and detectors etc. Various methods have been utilized to grow ZnO nanostructures on different substrates. Among all the available processes, wet chemical approaches, such as hydrothermal growth of ZnO nanostructures, is one of the most commonly used synthesis methods. ZnO seed layers were deposited by combining a sol gel process and a spin coating technique. The sol gel was prepared by using zinc acetate in a 2-methoxyethanol (solvent) and monoethanolamine (stabilizer). The spin coating was carried out on the indium tin oxide (ITO) glass at 3000 rpm for a time span of 20 seconds. The ZnO Nanorods were successfully grown as nanostructures from a fine grain ZnO seed layer by means of heating an aqueous solution of zinc nitrate hexahydrate and hexamethylenetetramine in a water bath at low temperature in the range of 65-90°C. It was shown that a dense array of ZnO nanorods was well-aligned and nanorod growth was successfully achieved based on a sol gel seed layer covered ITO glass substrate.

2) Signal Preemption Optimization

By Tien Nahn (Mentor: Dr. ManWo Ng)

Engineering

Signal preemption allows emergency vehicles to reach destinations quickly and increases safety when emergency vehicles cross intersections. The installation of preemption equipment at intersections requires significant investments. For this reason, only a subset of intersections can be equipped. In this research, we develop an optimization model to determine the optimal locations for signal preemption equipment installation. A simulated annealing algorithm is developed, and compared with existing optimization algorithms in a commercial software package.

3) Alternative Methods to Develop Reconfigurable Models

By Richard Hartman, & Daniel Broznak

(Mentor: Dr. Holly Handley)

Engineering

The objective of this project is to compare techniques and strategies to create flexible, rapidly configurable models to evaluate human performance. These models can be reconfigured to evaluate different task sequences or team size, as well as to represent a varying operational environments. This research will use the Command, Control, and Communication: Techniques for Reliable Assessment of Concept Execution (C3TRACE) tool to design alternate methodologies to create reconfigurable models. Resulting models can then be evaluated on the tradeoffs between model complexity and ease of reconfigurability, with the strengths, weaknesses and appropriate applications of each modeling approach identified.

4) Kinematics of a Painting Gesture in Aphasia?

Sarah Pomy & Haroon Osanzada (Mentors: Dr. Stacie Ringleb & Dr. Anastasia M. Raymer)

Engineering

Patients with aphasia as a result of stroke have difficulty speaking and they may have altered movement patterns. One speech rehabilitation strategy is to perform gestures of the word that the aphasic patient cannot produce. The long term goal of this project is to determine if the gesture based speech therapy will improve the upper extremity kinematics in these patients. The first step toward this goal is to understand the differences in kinematics between healthy and aphasic participants. Data were collected from five aphasic and five age and gender matched participants performing a painting gesture. Kinematics of the shoulder, elbow and wrist were compared.

5) Prostaglandin-Mediated Ovulation: Blood Vessel Formation in the Follicle

Laysa Hedjar and Dr. Diane M. Duffy (Mentor)

Physiological Sciences

Ovulation requires formation of new blood vessels (angiogenesis) within the follicle. Prostaglandins are paracrine mediators produced within the follicle and are necessary for ovulation. Prostaglandin PGE2 acts via its 4 EP receptors to stimulate signal transduction pathways within target cells. This study was performed to provide preliminary support for the concept that each EP receptor has a unique role in regulating angiogenesis in the ovulatory follicle. Adult female cynomolgus monkeys were treated with gonadotropins to promote follicle development and initiate events leading to ovulation. A surgical procedure was performed to inject the follicle with vehicle; the COX inhibitor indomethacin (which blocks prostaglandin production); indomethacin+PGE2; or indomethacin+ an EP-specific agonist. The ovary was removed 48 hours after injection. Immunocytochemistry was performed to detect von Willebrand factor (vWF), which marks endothelial cells surrounding vessels. Follicles given indomethacin+PGE2 were similar to vehicle-injected follicles: vWF+ cells extended from the basement membrane to the follicle antrum. Follicles given indomethacin+EP1 agonist had sparse vWF+ cells in the granulosa cell layer. Follicles given indomethacin+EP2 agonist were similar to follicles given indomethacin+EP1 agonist, except with more apparent vessel lumens. Follicles given indomethacin+EP3 agonist had few vWF+ cells migrating a short distance into the granulosa cell layer. Acquisition and analysis of indomethacin+EP4 agonist injected follicles is ongoing. No single EP receptor restores all aspects of PGE2-stimulated angiogenesis in the ovulatory follicle. Future studies could examine combinations of EP. Ultimately, this information could lead to development of treatments which block ovulation (potential contraceptives) or promote ovulation (treatments for infertility).

6) Searching for the Lost Fonts of Old Dominion University Abrams/Wheeler Collection

By Leslie Renn (Ken Daley & Heather Bryant)

This project was a combination of research, design, and creative work in the field of Letterpress Printmaking. Specifically, the project focused on researching and cataloguing a collection of late 19th and early 20th century unidentified moveable type from the Abrams/Wheeler collection of lead foundry and wood type that was acquired by the Old Dominion University Letterpress Print Shop from a trade museum in Pensacola, Florida. The project also included the design and creation of type specimen sheets for the type that was successfully identified and catalogued. Ultimately, the goal of this project was to initiate a dialogue that would promote and encourage an interest in the craft, provide a relevant, visual context to the historic Gutenberg invention, and foster the viability of letterpress as a useful medium for the written word. This research is relevant to history, literature, the arts, and industry, and it is a great asset to the scholarship of the academic community at Old Dominion University because it provides new information to existing materials.

The Development of an Undergraduate Research Apprenticeship Program (URAP): Outcomes of an Interdisciplinary Methodology and Research Center (IMaRC) Posters 6-11

7) The Journey of our Research Apprentices: Data from the Interdisciplinary Methodology and Research Center (IMaRC) Undergraduate Research Apprenticeship Program (URAP)

By Logan Self, Kevin Cullen, Ashley Henry, Alexey Popov, John Delos Reyes, Shelby Davis, Evie Hempler, Edneshia Mann, Miguel A. Padilla (Mentor), and Robin J. Lewis (Mentor)

This poster summarizes the activities of the Undergraduate Research Apprenticeship Program (URAP) from its inception. Descriptive data are presented about the students who participated in the URAP and the disciplines represented. The various developmental activities that comprised the URAP are summarized. Aggregate data regarding student research outcomes (e.g. conference presentations, publications, independent research projects, graduate school applications) are also presented as well as student satisfaction data.

8) The Land of Our Ancestors: Property Rights, Social Resistance, and Biofuel Energy Production in Madagascar

By Sherry Beeler & Terrance Ratliff, & Dr. Benjamin Neimark (Mentor)

Political Science & Geography

This study focuses on a well-known biofuel battleground in Madagascar, highlighting a case-study of successful social resistance against contemporary 'land grabbing.' Development economists advocate for formal property rights to secure tenure and stimulate agricultural investment in land and markets, and while foreign aid projects are beginning to address land rights in Madagascar, most of its agricultural zones remain under extremely complex tenure systems of overlapping state and customary claims. Yet, as competing visions of land securitization take hold; significant questions remain regarding whether there is adequate alternative for protecting rural Malagasy from dispossession of livelihood resources under biofuel production.

9) Sexual Minority Women's Transition to Parenthood: How Legal Barriers Relate to Relationship Strain

By Evie L. Hempler, Edneshia V. Mann, Tyler B. Mason, and Dr. Robin J. Lewis (Mentor)

Psychology

This research project focused on legal barriers and relationship strain experienced by sexual minority women (SMW) couples in the transition to parenthood. Ninety-seven self-identified lesbian women were recruited from 26 U.S. states that have not legalized same-sex marriage or second-parent adoption. Preliminary data analysis revealed that the mean age of the participant was 31 years, almost two-thirds (63.8%) had a college degree, and about half lived in an urban area. Researchers will present qualitative data identifying themes representing the experiences of lesbian parents living within states that have yet to legalize same-sex marriage and second parent adoption.

10) Female Athletes' Confidence and Experiences

By Shelby Davis, Tyler B. Mason, and Dr. Robin J. Lewis (Mentor)

Psychology

Disclosure of sexual orientation, sport confidence (individual self-confidence and team efficacy), and Sexual Orientation Microaggressions (SOMS) were examined in N =78 lesbian and bisexual NCAA Division I, II, and III collegiate athletes. There was an inverse relationship between SOMS and disclosure; as SOMS increased disclosure decreased. There was also an inverse relationship between SOMS and self-confidence; as SOMS increase, self-confidence decreased. These findings suggest that lesbian and bisexual women who experience SOMS are less likely to disclose sexual orientation and have less sport self-confidence. This may have implications for athletic performance.

11) Relationship of Work Characteristics and Job Outcomes

By Ashley Henry, Kevin Cullen, Logan Self, and Dr. Miguel A. Padilla (Mentor)

Psychology

Many factors influence faculty satisfaction and productivity in academia. Here, 1472 faculty from 47 US doctoral research universities participated. Preliminary results indicate that distributive justice, perceived organizational support, and autonomy predict burnout and job satisfaction. In particular, the present study suggests that distributive justice and perceived organizational support were more important to females, whereas autonomy was more important to males. Faculty are the focus because little is known about these factors in academia, and faculty wellbeing is important due to their everyday interactions/influence on students. Future research can delve deeper into some of the underlying causes of these relationships.

12) Risk versus Risk Perceptions: How Ideology Mediates Perceptions of Vulnerability

By Krista Andrews and Dr. Jesse Richman (Mentor)

Political Science

We examine how ideology interacts with personal vulnerability to shape perceptions of risk from global warming and sea level rise. We analyze multiple years of original survey data from coastal residents with varying degrees of personal vulnerability to sea level rise due to global warming. The results show that personal vulnerability leads to more polarized attitudes towards risks from global warming and sea level rise, with conservatives and liberals responding in distinctly different ways to the same personal circumstances. These results have important implications both for global policy response and the capacity to respond to personal risk.

3:00-4:30 PM
(Learning Commons: Northwest Atrium)
Visual Art Exhibition
Chairs: Elliott C. Jones & Heather Bryant

Student	Concentration	Faculty Mentor
Patrick Diggs	Crafts (Metalsmithing)	Dianne deBeixedon & Jane Ritchie
Thomas Labrie	Crafts (Blacksmithing)	Dianne deBeixedon & Jane Ritchie
Jesse Switzer	Crafts (Metalsmithing)	Dianne deBeixedon & Jane Ritchie
Margaret Bush	Drawing & Design	Elliott Jones
Shanice Johnson	Drawing & Design	Elliott Jones
Daniel Rojas	Drawing & Design	Elliott Jones
Constance Georghiou	Graphic Design	Kenneth FitzGerald & Ivanete Blanco
James Harris	Graphic Design	Kenneth FitzGerald & Ivanete Blanco
Renee Stepanek	Graphic Design	Kenneth FitzGerald & Ivanete Blanco
Manuel Zavala	Graphic Design	Kenneth FitzGerald & Ivanete Blanco
Matthew Budahn	Painting	Elliott Jones
Brittany Callis	Painting	Elliott Jones
Julie Pearson	Painting	Elliott Jones
Michael Santos	Painting	Elliott Jones
James Clark	Print & Photo Media (Photography)	Greta Pratt
Alexandra Serino	Print & Photo Media (Photography)	Greta Pratt
Kathryn Swartz	Print & Photo Media (Photography)	Greta Pratt
Christa Turpin	Print & Photo Media (Photography)	Greta Pratt
James Clark	Print & Photo Media (Printmaking)	Ken Daley & Heather Bryant
Leslie Renn	Print & Photo Media (Printmaking)	Ken Daley & Heather Bryant
Christa Turpin	Print & Photo Media (Printmaking)	Ken Daley & Heather Bryant
Alexander Dorney	Sculpture	John Roth
Angela Van Dyke	Sculpture	John Roth
Alexandra Whetzel	Sculpture	John Roth