

Old Dominion University Undergraduate Research Symposium
Friday, February 7th - Saturday, February 8th, 2014
Learning Commons, Perry Library

Sessions at a Glance

FRIDAY, February 7th, 2014

12:30 – 1:00 PM	Registration (Learning Commons, Northwest Atrium)
1:00-1:15 PM	Welcome and Opening Remarks (Learning Commons, Northwest Atrium): Dr. David Metzger, Dean – Honors College Old Dominion University
1:30-2:30 PM	<p style="text-align: center;">Empowerment Evaluation and Research: A Discussion of Homelessness (Room 1310, pg. 3) Chair: <i>Dr. Narketta Sparkman, Department of Counseling & Human Services</i> Presenters: <i>Ashley Reetz, Tamika Bright-Stubblefield, Rachel Haver, Jasmine Cottom</i></p> <p style="text-align: center;">New Research in Renaissance and Baroque Art (Room, 1311, pg. 4) Chair: <i>Dr. Agnieszka Whelan, Department of Art History</i> Presenters: <i>Andrea Dalton, Olivia Morgan, Cristina Irizarry, Carly Sutphin, Yvonne Frederick</i></p>
2:45-3:45 PM	<p style="text-align: center;">Student Award Winners Session (Room 1310, pg. 5-6) Chair: <i>Dr. Ivan Ash, Department of Psychology and Former Director of Undergraduate Research</i> Presenters: <i>Kayla Farrow, Alexander Cabatbat, Alexandra Whetzel, Amanda Laverty</i></p> <p style="text-align: center;">Art Education: Critical Thinking, Collaboration and Community Connections (Room 1311, pg. 7) Chair: <i>Patricia Edwards, Department of Art</i> Presenters: <i>Autumn Bailey, Leanna James, Ruth Freisenbruch</i></p>
4:00-5:00 PM	<p style="text-align: center;">Poster Session 1 (Learning Commons, Northwest Atrium, pg. 8-10) Featuring Political Science, Psychology, English, Recreation & Tourism Studies and Biology</p> <p style="text-align: center;">Undergraduate Visual Arts Exhibit (Learning Commons, Northwest Atrium, pg. 11)</p>

Sessions at a Glance

SATURDAY, February 8th, 2014

8:30 -8:45 AM	Registration (Learning Commons, Northwest Atrium)
8:45-9:00 AM	Welcome and Opening Remarks (Learning Commons, Northwest Atrium): Dr. David Metzger, Dean – Honors College Old Dominion University
9:15-10:15 AM	Poster Session 2 (Learning Commons, Northwest Atrium, pg. 12-14) Featuring Biochemistry, Physics, Engineering, Computer Science, Ocean & Earth Sciences and Modeling & Simulation Undergraduate Visual Arts Exhibit (Learning Commons, Northwest Atrium, pg. 11)
10:30-11:30 AM	New Research in Modern and Contemporary Art (Room 1306, pg. 15) Chair: <i>Dr. Robert Wojtowicz, Department of Art</i> Presenters: <i>Christopher Madden, Tracy Hundley, Jennifer Goodrich, Preston Mosley, Ashley Nicole Yarsinke</i> Facets of Physical Sciences (Room, 1310, pg. 16) Chair: <i>Dr. Stephen Bueltmann, Department of Physics</i> Presenters: <i>Colton Katsarelis, Katheryne McMahan, Timothy Naginey, James Porter, Eric Stacy</i> The Role of Research in Participatory Evaluation (Room 1311, pg. 17) Chair: <i>Dr. Narketta Sparkman, Department of Counseling & Human Services</i> Presenters: <i>Priscilla Myers, Raquel Jefferson, De Marcus Greene, Jasmine Hobson</i>
11:45AM-12:45 PM	Deadly Medicine and World War II: Cautionary Insight into Ethical Guidelines Left Unchecked (Room 1306, pg. 18) Chair: <i>Dr. Annette Finley-Croswhite, Department of History</i> Presenters: <i>Jessica Madril, James Hennessey, Sarah Keck, Lindsey Northup, Elisa Hendrix</i> RUMS: Research for Undergraduates in Math and Science (Room 1310, pg.19-20) Chair: <i>Dr. David Gauthier, Department of Biological Sciences</i> Presenters: <i>Elizabeth Smith, Jessica Vincent, Amarilis Dyer, Amy Johnson, Joseph Brown</i> Methods and Applications of Geospatial Technologies (Room 1311, pg. 21) Chair: <i>Dr. Hua Liu, Department of Political Science & Geography</i> Presenters: <i>Daniel Felarca, Kyle Coolbaugh, Jacob Brunswick, Christopher Johnson</i>
12:45 PM	Luncheon: North Cafeteria, Webb Center (Sponsored by the Honors College)

FRIDAY, February 7th, 2014

1:30-2:30PM (Learning Commons # 1310)

Empowerment Evaluation and Research: A Discussion of Homelessness

Chair: Dr. Narketta Sparkman

Department of Counseling and Human Services

This session looks into the struggles a family may face when dealing with homelessness. These struggles can be both internal and external for all members of the family. Shelter, stability and education are some of the issues examined to gain more understanding of what it is like to experience homelessness. Research on a local agency was also conducted to see how they help individuals in this predicament. This presentation discusses different programs offered by the agency to help homeless families get on their feet again. The research shows that the agency has appropriate programs needed for these individuals but do these programs empower the families to overcome their situations and succeed? An evaluation was performed to see exactly how these programs empowered their participants. The results show that each program has different ways of empowering their participants.

Empowerment Evaluation: An Introduction

By ASHLEY REETZ

This presentation will introduce empowerment evaluation. Empowerment evaluation will be defined and discussed in terms of the role of research. The researcher will discuss methods used in empowerment evaluation to collect data.

Current State of Homelessness Research

By TAMIKA BRIGHT-STUBBLEFIELD

This presentation will discuss the current state of homelessness. The researcher will define homelessness and discuss research findings on homelessness. The researcher will then discuss challenges in servicing homeless populations.

Use of Empowerment Evaluation

By RACHEL HAVER

This presentation will discuss the use of empowerment evaluation to evaluate agencies that service homeless populations. This presentation will discuss the assessment of a local agency that services homeless populations and describe the research methods utilized to collect data.

Evaluation of a Local Agency Servicing Homeless Populations

By JASMINE COTTOM

This presentation will discuss the findings of evaluating a local agency that services homeless populations. The researcher will discuss how goals and objectives are developed out of findings as well as how these findings improve program development. The researcher will discuss how empowerment of homeless populations can be improved through researcher recommendations that are evaluation based.

1:30-2:30 PM (Learning Commons # 1311)

New Research in Renaissance and Baroque Art

Chair: Dr. Agnieszka Whelan

Department of Art

The Interior of The Arnolfini Portrait by Jan van Eyck

By ANDREA DALTON (Mentor: Dr. Agnieszka Whelan)

The paper investigates the interior setting of The Arnolfini Portrait and asks the question whether the established reading of the space as the symbolic and spiritual realm is correct. This investigation begins with looking into the ancestries of both Giovanni Arnolfini and Giovanna Cenami and continues with an exploration of common practices for merchants at the time. The analysis then connects possible meanings to many of the objects in the room. It then concludes that the painting may be read entirely as a profane scene with objects of spiritual devotion present.

Rosso Fiorentino: A Metaphorical Message for the Masses

By OLIVIA MORGAN (Mentor: Dr. Anne Muraoka)

During the time of Florentine painter Rosso Fiorentino, Europe was experiencing a myriad of changes within its culture. From the emergence of Mannerist artists, to the revolutionary Ninety-Five Theses of Martin Luther, there were plenty of sources of inspiration for the artists of that time. Typically cast as merely a Mannerist painter Rosso Fiorentino presents more than Mannerist conceit in his Deposition. I will argue that Rosso dramatically depicted this biblical scene with the intention of challenging the current spiritual and theological belief system of the Florentine church, while also communicating his own personal convictions concerning the Christian faith.

The Face of Change: Mannerism and Modern Art Movements as Reflections of Crisis

By CRISTINA IRIZARRY (Mentor: Dr. Anne Muraoka)

The Mannerist artists of the sixteenth century created a style that surprised and shocked their viewers. These artists emerged out of a time of great uncertainty and change in the social-political and religious environments in which they lived. This paper argues that Mannerism should be considered a forerunner to the artistic demonstrations of more modern styles - such as Dada, Surrealism, and Abstract Expressionism - and how crisis can lead to innovation. The works we now encounter by the artists of these movements are their own protests against a reality they were discontented with.

The Jokes on You: The Jokes and Innovations of Guiseppe Arcimboldo's Allegorical Portraits

By CARLY SUTPHIN (Mentor: Dr. Anne Muraoka)

Giuseppe Arcimboldo was a celebrated sixteenth-century artist in his time, yet, contemporary art historians debate his impact. It has been argued that his allegorical portraits were comedic jokes of the royal court. In this paper, I will argue that Arcimboldo was in fact a great innovator of his time. I will demonstrate that his allegorical portraits are more than visual puns. He paved the road in elevating the still life in the hierarchy of genres, and more importantly to the development of highly intellectual styles of art such as Surrealism and Conceptual art.

Identifying St. Matthew

By YVONNE FREDERICK (Mentor: Dr. Anne Muraoka)

The artwork of the Baroque painter Caravaggio is overshadowed by his notorious reputation as a secular individual. He has been charged with being misinformed in all things sacred due to the method in which he arranged religious figures in his biblical scenes, particularly St. Matthew in The Calling of St. Matthew. From its completion in 1601, St. Matthew was undeniably identified as the bearded man in the painting. This paper will demonstrate that Caravaggio's informed relationship with religious doctrine, St. Matthew's traditional attributes, and varying accounts from the artist's biographers, aid in proposing an alternative identification for St. Matthew.

2:45-3:45 PM (Learning Commons # 1310)

Student Award Winners Session

Chair: Dr. Ivan Ash

Department of Psychology and Former Director of Undergraduate Research

Every semester, the Honors College sponsors the university-wide undergraduate research grant program. This program provides students with an opportunity to pursue original research, scholarship, or creative work under the mentorship of a full-time faculty member. This session includes presentations by four students who have been awarded these research grants in recent years; some of these projects have also received recognition at regional and national research conferences/meetings.

Correlational Study of Open Circuit Resonant (SANSEC) Sensor's Electric Field Distribution on Lightning Attachment

By KAYLA FARROW (Mentor: Dr. Linda Vahala), Department of Electrical and Computer Engineering

NASA Langley Research Center is conducting research to develop an open circuit SansEC sensor to provide lightning strike protection in conjunction with damage detection and diagnosis for composite aircraft. SansEC sensors are simplistic devices consisting of an open circuit conductive trace shaped in a planar geometric spiral. When the sensor is placed on a composite substrate, the electric impedance of the substrate is reflected in the sensors resonant response thus enabling it to detect permittivity and conductivity changes associated with composite damage. Test results indicated several SansEC sensor geometric configurations demonstrated an intrinsic ability to steer the lightning current along the corner of the sensor. To investigate this phenomenology, electromagnetic computational simulations were conducted to calculate the electric field distribution on the SansEC sensor's conductive trace to determine if the associated electromagnetic radiation preceding lightning attachment establishes modal structures on the conductive trace which predisposition the direction of the current flow.

Temperature Regulation of Algal Bloom Succession in the Lower James River Estuary

By ALEXANDER CABATBAT (Mentor: Dr. Margaret Mulholland), Department of Ocean, Earth & Atmospheric Sciences

I examined how water temperature controls the emergence of dinoflagellate blooms in the lower James River Estuary of the Chesapeake Bay. Because we believe temperature will play an important role in eliciting seasonal shifts in the dominant dinoflagellate populations, we conducted a targeted laboratory study during which we determined the growth kinetics of four of the dinoflagellates that commonly form blooms at different times of the year within the estuary. This data will be shared with modelers and the Virginia Department of Environmental Quality's James River Study Advisory Committee (of which Professor Mulholland is a member) who has expressed a need for such data to better parameterize bloom dynamics and their impacts.

Molding and Casting Materials Exploration as an Artist's Tool

By ALEXANDRA WHETZEL (Mentor: Dr. John Roth), Department of Art

As a medium, casting requires a technical understanding and a great deal of patience. The results can be endless and sophisticated with a proper mold. The point of this research was to explore molding and casting techniques and materials as an artist's tool. While material exploration held priority, the end goal was to have a set of skills to use to create conceptual work centering on interpersonal relationships in media culture, which was also researched separately. The physical nature of the work required much trial and error with a focus on three mold types: alginate molds from a live model, resin full body molds of a sculpted model, and rubber molds from separate parts. The alginate mold was poured over top of both the researcher and a volunteer to experience both perspectives. This was the hardest process and had the least results, but provided future insight into polishing the end piece. Resin molds are not as difficult and provided a reusable mold, but they are the most dangerous, technically sensitive, and time consuming. A reusable mold to pour into was made, but this is not a reliable method to use repeatedly due to weather, fumes, and disposability. Lastly, rubber molds were made in smaller box forms due to a high expense. Rubber molds came out the easiest to use with the results the closest to the desired outcome; however, to be used on a human sized subject, great care needs to be taken to conserve material as it hardens the slowest and must fill a container. From these processes and through direct discussion with professors and experts in the material, a more thorough understanding of the material is reached to create art pieces out of this process. Rubber molds seem the most efficient way to make smaller works, but resins are also viable on larger pieces if used safely at the right time of year. Alginate molds are very difficult to create full body casts and needs further research in warmer weather in order to be successful.

Antibiotic Resistance in *Vibrio Vulnificus* Isolated from the Chesapeake Bay during the Summers of 2006 and 2013

By AMANDA LAVERTY (Mentor: Dr. Fred Dobbs), Department of Ocean, Earth and Atmospheric Sciences

Vibrio vulnificus is a human pathogen that accounts for 95% of seafood-related deaths in the United States. The objective of this study was to assess whether antibiotic resistance in *V. vulnificus*, isolated from the Chesapeake Bay, has changed over time. Antibiotic-resistance profiles of strains collected and cryo-preserved in 2006 were compared with profiles of strains isolated in summer 2013. In both years, samples were collected from the water column and from oysters. A greater percentage of isolates from 2013 were resistant to streptomycin, along with increased intensities of resistance to the antibiotic. These results suggest increased antibiotic resistance over time.

2:45-3:45 PM (Learning Commons # 1311)

**Art Education: Critical Thinking, Collaboration and Community
Connections**

Chair: Patricia Edwards

Department of Art

Studio Collaborative Works

By AUTUMN BAILEY (with Nicole Dixon and Amanda Howell)

Ms. Bailey presents studio collaborative works: "Live Chess" Studio Art Methods Project and Dr. Seuss Event held at the Baron and Ellin Gordon Art Gallery and Village Bookstore (window) location where reading comes alive.

Studio Methods to Integrate Art into Practice

By LEANNA JAMES

Ms. James presents studio methods designed to integrate contemporary art into studio practice for teachers in early childhood education. Ms. James will share her discoveries through researching an artist and interpreting his work.

Studio STEAM Project

By RUTH FREISENBRUCH

Ms. Freisenbuch presents highlights from the studio STEAM project (kite) and community campus events in art education including connections with Hope House and the people they serve and our Dr. Seuss Celebration.

4:00-5:00 PM (Learning Commons: Northwest Atrium)

Poster Session 1

1) Risk versus Risk Perceptions: How Ideology Mediates perceptions of Vulnerability to Sea Level Rise

By KRISTA ANDREWS (Mentor: Dr. Jesse Richman)

Political Science

We examined how ideology interacts with personal vulnerability (living in a coastal flood zone) to shape perceptions of risk from global warming and sea level rise. 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.

2) A Model of Spaces where a Spoiler 3rd Party Candidate can Win a Negative Advertising War

By ROBERT POTTER (Mentor: Dr. Jesse Richman)

Political Science and Philosophy

This paper will inspect areas where it is possible to win an advertising war as a 3rd party spoiler candidate. Specifically I will focus on the space where the 2 major candidates are locked in a negative advertising battle. This leaves the candidate in the spoiler position an opening to move and take the election via a positive messaging campaign or a surprise negative attack. This model is focused on the last week of the election but can be expanded to examine more possibilities with further data.

3) Do Non-citizens Vote in U.S. Elections?

By CHATTHA GULSHAN (Mentor: Dr. Jesse Richman)

Political Science

In spite of substantial public controversy, very little reliable data exists concerning the frequency with which non-citizen immigrants participate in United States elections. Although such participation is a violation of election laws in most parts of the United States, enforcement depends principally on disclosure of citizenship status at the time of voter registration. This study examines participation rates by non-citizens using a nationally representative sample that includes non-citizen immigrants.

4) Mechanical Turk: A Viable Alternative to Laboratory Data Collection?

By KATIE MURPHY (Mentor: Dr. Debra Major)

Psychology

In recent years, Internet crowdsourcing has become an increasingly popular means of outsourcing human intelligence tasks to a temporary workforce. Websites, such as Amazon's Mechanical Turk (Mturk), offer researchers an alternative to traditional in-person data collection within the laboratory. An experimental study of stereotype threat in leadership, conducted in the summer of 2013, utilized both methods of data collection. The viability of using Mturk in research will be examined by comparing the Mturk sample to the laboratory sample. Comparisons will be made in five major areas: demographics, data quality, completion time, performance on outcome variables, and sample distributions.

5) The Relationship between Minority Stress and Drinking Motives among Lesbian Women

By TOLU AKINOLA, with Melissa Gaskins, Lance Irons and Colleen Rennie (Mentor: Dr. Robin Lewis)

Psychology

Lesbian women report more alcohol use than heterosexual women. However, less is known about why lesbian women drink more than heterosexual women. Researchers have hypothesized that lesbian women may drink more as a result of the increased stress of identifying as a sexual minority (i.e., minority stress). The purpose of the current study was to examine correlations between minority stressors and drinking motives in a large sample of self-identified lesbian women. Minority stressors included internalized homophobia, outness, and connection to the lesbian community. Drinking motives included enhancement, social, coping, and conformity motives.

6) Student Satisfaction and Faculty Evaluations: Does Grade-Curving have a Factor?

By KEVIN CULLEN (Mentor: Dr. Miguel Padilla)

Psychology

The purpose of this study is to determine if fairness and grade curving affect overall student satisfaction and evaluation of faculty. Researchers have suggested that there is a possible link between grading procedures and end-of-the-year evaluations. Here, students from Old Dominion University who have taken Quantitative Methods or a content course in Industrial/Organizational Psychology within the past two years will be given a set of professor evaluation measures and a knowledge-based assessment. This study can potentially provide empirical support that grade curving is positively related to student satisfaction ratings and variance in faculty evaluations.

7) Does Course Content influence Student Satisfaction?

By JOHN MART DELOSREYES (Mentor: Dr. Miguel Padilla)

Psychology

The results of course evaluations are often a determinant on the livelihood of the college instructors of these courses; however, these results may not actually reflect the skills of these instructors. Past research has shown that students typically rate social science courses higher than natural science courses (Beran & Violate, 2005). This study will explore how students' perceptions of course content influence overall course satisfaction. This will be evaluated by a means difference approach looking at the satisfaction scores of a quantitative methods course and a psychology content course. We expect that satisfaction will be higher in the content course.

8) L2L Game

By KATELYN KIETLINSKI (Mentor: Megan McKittrick)

English

To facilitate a commitment to learning, our team of faculty, graduate, and undergraduate students from the English and Education Departments are currently designing a digital gaming environment providing instruction for various learning skills and prompts for meta-reflective activities, while motivating students with game-style reward systems. This environment will also allow faculty to associate specific learning skills with relevant course content. We will collect qualitative and quantitative data to assess learning outcomes. We will assess how faculty members implemented the game into their courses by collecting course materials and interviews. We will then collect reflective responses by the students during game play. This poster session is an opportunity to share research results that are currently in progress.

9) Epigenetic Effects of Pollutants on Mya Arenaria in the Chesapeake Bay

By ZACHARY FITZPATRICK (Mentor: Dr. Lisa Horth)

Biology

Due to the state of the Chesapeake Bay watershed, there are species existing in polluted benthic sediment. The study was done to quantify potential epigenetic changes of *Mya arenaria*, when exposed to contaminated benthic sediment and multiple concentration oil spills in the laboratory. Clams were exposed to multiple forms of polycyclic aromatic hydrocarbons. Epigenetic changes are known to exist in marine invertebrates when in the presence of PAHs. The study was done to test which significant contaminants generate epigenetic activity in *Mya arenaria*.

10) The Current Status of Marine Protected Areas in the Western Central Atlantic

By SHANNAN HURLEY (Mentor: Dr. Kent Carpenter and Christi Linardich)

Biology

The effectiveness and coverage of marine protected areas (MPAs) in the Western Central Atlantic is of high concern in relation to conserving biodiversity in the region. In light of initiatives to expand coverage and management capacity, it is essential to know the current status of MPAs in this region. This study compiled and analyzed data for 709 MPAs from 42 nations and territories. The results indicate that future marine conservation planning in this region should strive to install meaningful management plans, integrate high-level species protection such as no-take zones, and choose to incorporate a variety of habitat types when possible.

11) Determination of Pollinator Preference by Artificial Ultraviolet Cue Manipulation

By JUSTIN WESTERFIELD (Mentor: Dr. Lisa Horth)

Biology

Visual cues from flowers have long been known to facilitate the attraction of pollinators such as bees. Previous studies on black-eyed susans have shown that bees visit selectively according to, among other things, the ratio of ultraviolet (UV) reflecting to UV absorbing portions of flowers' petals. By constructing an artificial flower out of light emitting diodes, I manually manipulated the UV reflecting to absorbing ratio. The effects of this manipulation on pollinator attraction were then studied in hopes of finding an "ideal" ratio. Although preliminary results are inconclusive, the portable devices are prepared for continued experimentation in the spring.

4:00-5:00 PM FRIDAY 7th
and
9:15-10:15 AM SATURDAY February 8th
(Learning Commons: Northwest Atrium)

Visual Art Exhibition
Chairs: Elliott Jones and Heather Bryant

Student	Concentration	Faculty Mentor
Christopher Breighner	Crafts (Metalsmithing)	Dianne deBeixedon & Jane Ritchie
Rebekah Hall	Crafts (Metalsmithing)	Dianne deBeixedon & Jane Ritchie
Shakira Brooks	Drawing & Design	Elliott Jones
Rebekah Hall	Drawing & Design	Elliott Jones
Jux Howell	Drawing & Design	Elliott Jones
Sandra Connors	Graphic Design	Kenneth FitzGerald, Ivanete Blanco & David Shields
Anna Patricia Tobias	Graphic Design	Kenneth FitzGerald, Ivanete Blanco & David Shields
Robert Wolford	Graphic Design	Kenneth FitzGerald, Ivanete Blanco & David Shields
Margaret Bush	Painting	Elliott Jones
Yvonne Frederick	Painting	Elliott Jones
Karina Nigro	Painting	Elliott Jones
Michael Santos	Painting	Elizabeth Leeor
Frances Sahagan	Print & Photo Media (Printmaking)	Ken Daley & Heather Bryant
Suzanne Burns	Print & Photo Media (Printmaking)	Ken Daley & Heather Bryant
Jessica Gunsher	Print & Photo Media (Printmaking)	Ken Daley & Heather Bryant
Zachary Stille	Sculpture	Peter Eudenbach
Angela Van Dyke	Sculpture	John Roth
Amelia Wood	Sculpture	John Roth

SATURDAY, FEBRUARY 8TH 2014

**9:15-10:15 AM (Learning Commons: Northwest Atrium)
Poster Session 2**

1) Expression and Purification of HRV-14 3D Polymerase for In Vitro Studies

By JUHI RAMCHANDANI (Mentor: Dr. Steven M. Pascal)

Biochemistry and Biology

Rhinovirus is the etiological agent responsible for causing the common cold, a most prevalent, yet uncured, illness. A member of the Picornaviridae family, rhinovirus is found among other notable human pathogens, including poliovirus and hepatitis A virus. Members of this family share a common, highly conserved replication mechanism, which involves synthesis of a polyprotein that self-cleaves into several structural and non-structural proteins, such as 3D, an RNA-dependent-RNA polymerase necessary for genome replication. The overall goal of the Pascal lab is to understand the interactions of protein 3D during genome replication in the aims of facilitating drug design against Picornaviral infections.

2) Exploring the Plasmonic Optical Properties of Single Silver Nanoparticles

By SETH WARREN (Mentor: Dr. Nancy Xu)

Biology and Biochemistry

One of the emerging fields of research is that of nanomaterials. Nanomaterials are particles of small size, typically between 1-100 nm, made from noble metals, metal oxides, and other elements. Furthermore, their size lends them to have remarkable optical properties, such as their absorbance, scattering, and extinction, which are remarkably different than their bulk counterparts. This allows them to be used for far more applications in biology, chemistry, and engineering. In this study we look at the theoretical modeling of the optical properties of silver nanoparticles, in order to determine future sizes, shapes and surrounding environments for specific future applications.

3) The Effect of Harmonic Vibrations on the Disruption of a Bacterial Biofilm

By AMARILIS DYER (Mentor: Dr. Dayle A. Daines)

Biochemistry

Bacterial biofilms are composed of cell populations that adhere to a surface using a self-produced matrix of extracellular polymeric substances. Our goal was to identify the characteristics of harmonic excitation, namely the frequency, which would be most effective to de-laminate biofilms from an abiotic surface. First we determined which bacterium formed the maximum biofilm over 24 hours, then subjected these to various frequencies of harmonic excitation in 96-well plates and quantitated the effect of each frequency on biofilm disruption. We conclude that 931 Hertz was the optimal frequency to de-laminate *E. cloacae* biofilms under the conditions of our assay.

4) A Solid Polarized Target for CLAS12 at Jefferson Lab

By MATHIEU EHRHART (Mentor: Dr. Stephen Bueltmann)

Physics

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 technique of dynamic nuclear polarization (DNP) requires very low temperatures around 1 Kelvin and a high magnetic field of around 5 Tesla. The very large natural polarization of free electrons inside the target material under these conditions is transferred to the nuclei via microwave radiation (electron Larmor frequency). The polarization of the protons and deuterons is measured with the nuclear magnetic resonance (NMR) technique.

5) Laser-Induced Fluorescence and Optical Emission Spectroscopy used for Plasma Diagnostics

By JOSEPH NEWTON (Mentor: Dr. Leposava Vuskovic)

Physics

Gas discharges of Argon can be characterized by a method called optical emission spectroscopy (OES). The spectral lines can provide information regarding which energy excitations and emissions occur and how much intensity those transitions have. When atoms are excited by electron impacts, those electrons exchange energy by the emission of photons; this is the basis of OES. Despite OES's effectiveness with finding certain population densities, the population density of metastable states cannot be determined without an external source of excitation such as a laser. Laser-induced fluorescence is a viable option for determining this value. By combining optical emission spectroscopy and laser-induced fluorescence, we were able to characterize Argon discharges in the supersonic gas flow and well as Cl₂/Ar plasma for the surface processing of cylindrical cavities. The population densities of the s and p levels were determined as well as electron density and electron temperature for varying pressures.

6) A New Simulation Architecture to Reduce the Computational Complexity of Agent-Based Simulations

By JESSE CALDWELL (Mentor: Dr. Jim Leathrum)

Modeling, Simulation and Visualization Engineering

Agent-based simulation is an emerging field of simulation, which can be used to simulate very unique systems. One of the largest issues with agent-based simulation is their computational complexity. This project takes a new approach at the underlying simulation architecture to improve the performance by reducing the computational complexity of the underlying simulation architecture. Using this new simulation architecture, the project was able to simulate an order of magnitude or more agents than traditional agent-based simulations.

7) A Multifractal Approach to Human Brain Tumors

By RANDALL MAYS (Mentor: Dr. Khan Iftekharuddin)

Electrical Engineering

Automated brain tumor detection methods require robust processing methods to accurately identify regions of interest for use in a clinical setting. Tumor regions of interest consist of necrotic regions, active tumor growth, and the associated edema surrounding the tumor. This research is to identify additional features in MR imaging using multifractal analysis to improve accuracy in image segmentation. Supplementing current methods with multifractal analysis will provide improved robustness in the automated process and thereby improve accuracy in medical diagnosis and prognosis.

8) Power Control System for Small Satellites

By JASON HARRIS (Mentor: Dr. Dimitrie Popescu)

Electrical Engineering

ODU is conducting research into launching satellites. The purpose of this research experiment is to investigate the electrical characteristics of lithium polymer batteries and to develop a power management system. The batteries are currently being investigated to see how many charge cycles they can have. A power management system will be designed to be capable of charging the batteries and withdrawing power from them when needed. The system will be connected to solar cells which will have a constantly changing orientation with respect to the sun, so it must be designed to be as efficient as possible.

9) Correlational Study of Open Circuit Resonant (SANSEC) Sensor's Electric Field Distribution on Lightning Attachment

By KAYLA FARROW (Mentor: Linda L. Vahala)

Electrical Engineering

Lightning-direct effect current tests were conducted on multiple SansEC sensor configurations to evaluate their ability to withstand the incident lightning energy and protect the underlying composite. Test results indicated several SansEC sensor geometric configurations demonstrated an intrinsic ability to steer the lightning current along the corner of the sensor. To investigate this phenomenology, electromagnetic computational simulations were conducted to calculate the electric field distribution on the SansEC sensor's conductive trace to determine if the associated electromagnetic radiation preceding lightning attachment establishes modal structures on the conductive trace which predisposition the direction of the current flow. The simulations provide a means to

visualize the trace's modal structure and identify electric field regions residing on the sensor. This research presents a correlational study of the SansEC sensor's computed electric field distribution to the measured lightning propagation direction for various SansEC sensor configurations.

10) The Use of Flash Hydrolysis as a Means of Extracting and Recycling Nutrients during Production of Algae Biofuels

By JONATHAN RICCI (Mentor: Dr. Sandeep Kumar)

Mechanical Engineering

Algae biofuels show a great deal of promise as a safe and renewable source of fuel. However, there are currently some limitations in the process that make algae biofuels less efficient than other potential alternative energy sources. For example, algae tends to use a large amount of Nitrogen and Phosphorus. These nutrients, Phosphorus in particular, are valuable and finite. In this project, we used flash hydrolysis in subcritical water in order to remove the nutrients from the algae before it is processed into biofuel. These nutrients can then be recycled to make the process more efficient and less resource intensive.

11) Synthesis of PbTe and PbSe Thin Films by Atomic layer Deposition for Thermoelectric Applications

By KAREN BOLLENBAH (Mentor: Dr. Helmut Baumgart)

Engineering Science

This study successfully established, for the first time, a thermal atomic layer deposition process (ALD) to synthesize nanolaminate superlattice structures of alternating layers of lead telluride (PbTe) and lead selenide (PbSe) thin films on silicon (Si) substrates covered with native oxide. PbTe and PbSe are AIVBVI narrow gap semiconductor lead chalcogenides with an FCC rock salt structure. PbTe is of particular interest due its high operating temperature of 600-850 K and melting point of 900K which is well suited for automotive and industrial applications.

12) Antibiotic Resistance in the Vibrio Vulnificus Isolated from the Chesapeake Bay during the Summers of 2006 and 2013

By AMANDA LAVERTY (Mentor: Dr. Fred C. Dobbs)

Ocean and Earth Sciences

Vibrio vulnificus is a human pathogen that accounts for 95% of seafood-related deaths in the United States. The objective of this study was to assess whether antibiotic resistance in V. vulnificus, isolated from the Chesapeake Bay, has changed over time. Antibiotic-resistance profiles of strains collected and cryo-preserved in 2006 were compared with profiles of strains isolated in summer 2013. In both years, samples were collected from the water column and from oysters. A greater percentage of isolates from 2013 were resistant to streptomycin, along with increased intensities of resistance to the antibiotic. These results suggest increased antibiotic resistance over time.

10:30 AM – 11:30 AM (Learning Commons # 1306)
New Research in Modern and Contemporary Art
Chair: Dr. Robert Wojtowicz
Department of Art

Mark Rothko and Theater

By CHRISTOPHER MADDEN (Mentor: Dr. Vittorio Colaizzi)

Theater is a venue tailored to conveying human emotions. Before he was a famous painter, Mark Rothko had ties to theater and drama. Could this have influenced the art he created in his later life? This paper examines the connection between theater and Mark Rothko's paintings. Exploring both the cerebral and aesthetic realms of influence, I aim to highlight this connection and show how specifically his work was impacted.

Sigmar Polke: Small “m” modernist

By TRACY HUNDLEY (Mentor: Dr. Vittorio Colaizzi)

There are two different types of modernist practice; One is a general modernism and the other is the more specific form, which was conceived by Clement Greenberg and is sometimes designated with a capital M. Sigmar Polke's work would be excluded from Greenberg's Modernism due to its use of mass culture and "low" art forms. Polke's work could possibly be associated with postmodernism, but the seriousness of his subject matter pushes him away from postmodernism's shallow play of signs. This paper seeks to prove that Polke's body of work is modernist with a lowercase m.

Mapplethorpe and the Sublime

By JENNIFER GOODRICH (Mentor: Dr. Vittorio Colaizzi)

With photographs that offended many viewers, Robert Mapplethorpe (1946-1989) combined formal perfection with unrestrained human nature. Like Rothko and Caravaggio, who achieved the sublime through the transgression of norms, Mapplethorpe attempted to touch the sublime through visceral images that arouse intense feelings. His S&M photographs explore human vulnerability. At a posthumous obscenity trial, a jury found the perfection of formal qualities qualified his work as art. Paradoxically, it is the "obscenity" of his photographs that makes them effectively stirring rather than merely formal.

Yoshi Taniguchi, Museum of Modern Art Expansion

By PRESTON MOSLEY (Mentor: Dr. Robert Wojtowicz)

Founded in 1929, as the personal art collection of John D. Rockefeller, the Museum of Modern Art has since transformed into one of the premiere art museums in the world. Throughout this transition, MoMA has been expanded and redeveloped several times. However, none were as monumental in scale and/or vision as Japanese architect Yoshie Taniguchi's 1997-2004 expansion. Taniguchi's work would nearly double both the museum's exhibition space and total overall size. Taniguchi's clean and elegant design style, with its restraint from unnecessary ornament, transformed MoMA into a beautiful example of Modern architecture.

World's Fair Gardens in Maymont Estate: The Case of the Japanese Garden

By ASHLEY NICOLE YARSINKE (Mentor: Dr. Agnieszka Whelan)

The world's fairs brought cultures from far and wide to the Americas. They introduced foreign skills and the excitement of outdoor arts. It was during the 1876 Centennial Exposition in Philadelphia that the concepts of landscape design were explored, current trends were reflected and the new styles of Japanese gardening were introduced to the public. In this paper I will be making a case for connecting the Maymont Estate in Richmond, Virginia to the gardens exhibited at the fairs. My specific focus will be on the Japanese garden commissioned by Mrs. Sallie May Dooley, wife of the owner of Maymont.

10:30 AM – 11:30 AM (Learning Commons # 1310)

Facets of Physical Sciences

Chair: Dr. Stephen Bueltmann

Department of Physics

Corrosion of Aluminum on Navy Ships

By COLTON KATSARELIS

Corrosion of metal depends on its chemical activity and the environmental conditions. Aluminum used in naval vessels is mainly susceptible to galvanic corrosion due to salt water. Examples of aluminum corrosion and its analysis on navy ships will be discussed and protective methods described.

Polarized Target for CLAS12 at Jlab

By KATHERYNE MCMAHAN

The study of the spin-dependence of the nucleon structure with electron scattering experiments requires targets of spin-polarized nuclei. 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.

The Determination of Positronium Formation Cross Sections using the CTMC Method, and its Applications

By TIMOTHY NAGINEY

Charge exchange cross sections are presented for collisions of positron and protons with hydrogen, neutral and singly ionized helium targets, using a variant of the classical trajectory Monte Carlo (CTMC) approach. The basic physics of e^+e^- creation and annihilation is overviewed and a formalism for the computational calculation presented.

Scintillation Counters for Hall C at Jlab

By JAMES PORTER

The doubling of the electron beam energy at Jefferson Lab to 12 GeV requires the development of new or reconfiguration of existing detectors. Scintillation detectors, previously used with the CLAS detector in Hall B are being refurbished at ODU and will be used for new experiments in Hall C.

Positronium Formation from Positron Impact *off* Hydrogen and Helium Targets

By ERIC STACY

Charge exchange cross sections are presented for collisions of positron and protons with hydrogen, neutral and singly ionized helium targets, using a variant of the classical trajectory Monte Carlo (CTMC) approach. The basic physics of e^+e^- creation and annihilation is overviewed. It is shown that for atomic hydrogen and helium targets electron capture by a free positron to form positronium is vastly more probable than inflight annihilation. Good agreement with available experiment is found and the charge cross section for positron of He^+ predicted.

10:30 AM – 11:30 AM (Learning Commons # 1311)

The Role of Research in Participatory Evaluation

Chair: Dr. Narketta Sparkman

Department of Counseling & Human Services

In this session the presenters will guide the audience through the necessary steps to conduct an evaluation using the participatory research method and explain their experiences with using the method. When an evaluator uses a participatory evaluation they get stakeholders to accompany them through the process of assessing the program. This would entail generating questions, outlining a plan, selecting the necessary measures and data collection methods, and interpreting the data. From the information gathered, analyses are formed and recommendations are then derived from the findings. Conducting this type of evaluation allows stakeholders to build knowledge, skills and relationships among the community.

Introduction to Evaluation

By PRISCILLA MYERS

In this presentation the researcher will provide an introduction of evaluation and the role of research in developing an evaluation plan utilizing participatory evaluation method. The presenter will discuss how research informs the evaluator and helps guide the evaluation plan.

Constructs in Conducting Participatory Evaluation

By RAQUEL JEFFERSON

In this presentation the researcher will define participatory evaluation and discuss the related constructs of conducting a participatory evaluation. The presenter will discuss the research conducted prior to executing the evaluation as well as possible methods of collecting data.

Methods in Participatory Evaluation

By DE MARCUS GREENE

In this presentation the researcher will discuss research methods used in conducting participatory evaluation. The presenter will give an example of the use of participatory method in the evaluation of a local non-profit agency. The presenter will discuss finding of the evaluation.

Role of Evaluation in Program Development

By JASMINE HOBSON

In this presentation the researcher will discuss the role of evaluation findings in program development. The presenter will discuss how to develop goals and objectives out of evaluation findings as well as how this informs stakeholders.

11:45 AM – 12:45 PM (Learning Commons # 1306)

Deadly Medicine and World War II: Cautionary Insight into Ethical Guidelines Left Unchecked

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

Language and Mass Murder during the Holocaust

By JESSICA MADRIL

This paper explores how German doctors and scientists used terms like "racial hygiene" and "eugenics" to legitimate mass murder. It explores the evolution of ideas that eventually led to ethical violations in medicine before World War II even began.

Scientific Research and Ethical Crimes in Germany in the 1930s and 1940

By JAMES HENNESSEY

This paper highlights the tremendous disconnect that existed in Nazi Germany between medical practice and ethical ideals. It explores the human experimentation, mutilation and extermination that took place during the World War II as doctors committed horrific crimes to enhance the Nazi state's scientific understanding. It offers a cautionary tale about ethical violations and medicine.

'Perverse Logic': The Transformation of German Medicine into Nazi Medicine

By SARAH KECK

This paper discusses the Eugenics movement in Germany and the United States. It shows how eugenics led to sterilization and euthanasia projects in Germany under the title "Action T-4" in the 1930s. The German T-4 physicians eventually ended up in Nazi death camps by 1942 overseeing medical experiments tied to the "Final Solution." They were perpetrators in crimes against humanity.

Nazi Medicine and Josef Mengele

By LINDSEY NORTHRUP

Dr. Josef Mengele, commonly known as the "Angel of Death" was an SS physician who worked at the infamous Auschwitz death camp in Poland. This paper explores his background and legacy with regard to Nazi medicine. Mengele committed some of the worst ethical violations in medical history.

The Creation of the Nuremberg Code and its Impact on Medical Ethics

By ELISA HENDRIX

This paper explores the Nuremberg Code, a set of ten ethical ideals adopted by the Allied countries after World War II during the trial known as the Doctor's Trial held at Nuremberg. This legal forum considered the fate of twenty-three doctors and health administrators who were found responsible in the post-war period for conducting unethical medical experimentation on human subjects and participating in mass murder during the Holocaust. The judges were shocked by what they heard in the witness testimonies in accounts of what became known as crimes against humanity. The resulting Nuremberg Code was devised to prevent such ethical violations in the future.

11:45 AM – 12:45 PM (Learning Commons # 1310)

RUMS: Research for Undergraduates in Math and Science
Chair: Dr. David Gauthier
Department of Biological Sciences

Effects of Temperature on Experimental Mycobacteriosis in Striped Bass (*Merone saxatilis*)

By ELIZABETH SMITH, with Wolfgang Vogelbein and MariCarmen Korngiebel-Rosique (Mentor: Dr. David Gauthier)

The bacterial disease mycobacteriosis is highly prevalent in striped bass of Chesapeake Bay. *Mycobacterium shottsii* and *Mycobacterium pseudoshottsii* appear to be the major agents associated with disease in this system. With increased eutrophication, the deeper waters of Chesapeake Bay have become increasingly hypoxic and it is speculated that striped bass are subject to a "thermal oxygen squeeze"; hypoxia in the deeper waters pushes the fish into shallower, warmer waters, potentially leading to increased susceptibility to infection. In this study, we examined the effect of temperature on infection with *M. shottsii* and *M. pseudoshottsii* in striped bass.

Birds as Vectors of *Rickettsia parkeri*

By JESSICA VINCENT, with Chelsea Wright and Erin Heller (Mentors: Drs. David Gauthier, Eric Walters, Holly Gaff)

In 2004, the bacterial pathogen *Rickettsia parkeri* was identified as the causative agent of Tidewater spotted fever in humans. *Amblyomma maculatum*, the Gulf Coast ticks, are carriers and spread in a rapid, punctuated pattern which is atypical of terrestrial animal vectors. This implicates birds as likely dispersal agents. To determine whether birds play a role in the spread of *A. maculatum*, we are attempting to detect *Rickettsia parkeri* in wild avian blood samples. We use a *Rickettsia* spp. specific TaqMan assay, and test positive samples for species-level identification. Currently, out of the 200+ samples tested, none have been positive.

The Effect of Harmonic Vibrations on the Disruption of a Bacterial Biofilm

By AMARILIS DYER, with Jarrod Cath (Mentors: Drs. Onur Bilgen, Dayle Daines)

Bacterial biofilms are composed of cell populations that adhere to a surface using a self-produced matrix of extracellular polymeric substances. Our goal was to identify the characteristics of harmonic excitation, namely the frequency, which would be most effective to de-laminate biofilms from an abiotic surface. First we determined which bacterium formed the maximum biofilm over 24 hours, then subjected these to various frequencies of harmonic excitation in 96-well plates and quantitated the effect of each frequency on biofilm disruption. We conclude that 1931 Hertz was the optimal frequency to de-laminate *E. cloacae* biofilms under the conditions of our assay.

Interactions between Small Mammals and Ticks in the Hampton Roads Area

By AMY JOHNSON, with Robyn Nadolny and Jana Eggleston (Mentor: Dr. Holly Gaff)

Ticks are the most significant disease-causing arthropods in the United States. In the Hampton Roads area, there are fourteen species of ticks, many of which are confirmed disease vectors or have the potential to transmit pathogens to humans. Ticks have a unique life history with each species having a preferred host or hosts for each of their three life stages: larval, nymphal and adult. Tick species that do not bite humans have the capability to amplify these pathogens in wildlife, which can in turn spill over to increased risk to humans. Although some immature ticks are also collected via flagging, the typical methodology for collection, immature ticks can more readily be collected off of wild birds and small mammals. Small mammals are the preferred host of the immature stages of many tick species. To collect data on small mammal populations, movement, and tick load, we have been live trapping for small mammals. Modified Fitch traps are baited with seed in the evening and checked at sunrise the following morning. Results of the frequency of ticks found on each small mammal species will be presented. Additionally, seasonal variation in these frequencies will be presented. Small mammal trapping has been shown to be an effective source of information on host preference for the immature stages of ticks.

Using Pheromones to Enhance Field Tick Collection Techniques

By JOSEPH BROWN, with Pamela Kelman (Mentor: Dr. Holly Gaff)

The established method of tick flagging was tested against a new method, consisting of a newly designed flag with four different treatments. The different treatments included an unscented flag, a flag scented with hog urine, a flag dispersing carbon dioxide, and a flag both scented with hog urine and dispersing carbon dioxide. The new flag design was tested against the traditional flag, and the different treatments were also compared to each other. The species collected include *Amblyomma americanum*, *Dermacentor variabilis*, *Amblyomma maculatum*, and *Ixodes scapularis*. When compared, the new flagging method was shown to collect the most ticks overall, but there was some variation between the different sites in which flag had more. Further research is needed in order to further confirm the results.

11:45 AM – 12:45 PM (Learning Commons # 1311)

Methods and Applications of Geospatial Technologies

Chair: Dr. Hua Liu

Department of Political Science & Geography

Assessing Hospitals, Population, and Mortality Rates in Ohio with Geospatial Technologies

By DANIEL FELARCA

This project attempts to determine how Ohio's mortality rate is increased or decreased by the amount of medical facilities it contains, as well as the amount of people who live there. ArcMap is used to create six maps: one for Ohio's population, another for its hospital count, and the third for its death rate. Regression maps are then created for all three in order to determine which had a higher effect on the Ohioan death rate.

Geostatistics of Tornadoes in Virginia

By KYLE COOLBAUGH

Despite Virginia's eastern location in the continental United States, tornadoes still play a major role in the meteorology of the state. Studying these severe weather events and the injuries and destruction they cause helps to further the understanding of what causes the impacts seen after these storms strike. Through the use of geostatistics it is possible to examine past events to find trends into the future. Tools such as mean and median centers, as well as directional distributions are used to show where these storms strike most frequently and to where they move. Clustering tools such as hotspot analysis and clusters and outliers break down the trends of the storms and the injury patterns therein. Spatial autocorrelation helps to look at the patterns of the storms.

Mapping Gaps in Virginia Beach Bus Service

By JACOB BRUNSWICK

The project objective is to identify areas in Virginia Beach that are lacking transit service using 203 points of interest including grocery stores, schools, churches, libraries, and tourist attractions to represent places people need to go. Current bus service are drawn and buffered to eliminate points already being serviced. Only points that have a neighbor within 2000 feet are remained. The results are 21 clustered points representing 8 heavily utilized areas that are lacking public transportation service in the city.

Earthquake Study East of the Mississippi River with GIS

By CHRISTOPHER JOHNSON

The objective of this research is to determine where the largest earthquakes east of the Mississippi River have occurred. A group of point shapefiles representing earthquake occurrences are created based on four time frames: USGS date of foundation (1879-1899), 1900-1949, 1944-1999, and 2000-present. A 200-mile buffer is created around each earthquake event to show where the effects of the earthquake might have been felt.