

Old Dominion University Undergraduate Research Symposium
Saturday, February 13, 2016
Learning Commons, Perry Library

Sessions at a Glance

8:00 – 8:40 AM	Registration and Continental Breakfast (Learning Commons, Northwest Atrium)
8:40 – 8:45 AM	Welcome and Opening Remarks (Learning Commons, Northwest Atrium): David Metzger, Dean of Honors College
8:00 AM – 12:30 PM	Poster Session (Learning Commons, Northwest Atrium, pp. 3-8) Featuring Electrical, Computer, and Civil Engineering, Physics, Computer Science, Psychology, Biological Sciences, Chemistry, and Human Services Undergraduate Art Exhibit (Learning Commons, Northeast Atrium, p. 2)
9:00 – 10:00 AM	Oral concurrent session I <i>Biological Sciences I: Birds, Ticks, and Algae</i> (Rm. 1310) Chair: Eric Walters <i>Facets of Physics Research</i> (Rm. 1311) Chair: Stephen Buelmann <i>Art History Session 1: Convergence and Synthesis: Style, Media, Philosophy</i> (Rm. 1306) Chair: Vittorio Colaizzi
10:15 – 11:15 AM	Oral concurrent session II <i>Biological Sciences II: Aquatic Sciences</i> (Rm. 1310) Chair: Dan Barshis <i>Undergraduate Research in Psychology I</i> (Rm. 1311) Chair: Debra Major <i>Art History Session 2: The Subject and Society: Negotiating Conventions</i> (Rm. 1306) Chair: Anne Muraoka
11:30 AM – 12:30 PM	Oral concurrent session III <i>Biological Sciences III: Microbiology</i> (Rm. 1310) Chair: Dayle Daines <i>Undergraduate Research in Psychology II</i> (Rm. 1311) Chair: Michelle Kelley <i>Drawing and Digital Animation</i> (Rm. 1306) Chair: Elliott Jones
12:30 – 1:30 PM	Lunch in Café 1201 – Webb Center

8:00 AM – 12:30 PM
(Learning Commons: Northeast Atrium)
Undergraduate Art Exhibit
Chairs: Elliott C. Jones & Heather Bryant, Art Department

Student	Concentration	Faculty Mentor
Aimee Bruce	Drawing & Design	Elliott Jones
Amanda Gonzalez	Drawing & Design	Elliott Jones
Melissa Griffis	Drawing & Design	Elliott Jones
Monica Turley	Drawing & Design	Elliott Jones
Phillip Percy	Fibers	Dianne deBeixedon
Janice Davidsson	Fibers	Dianne deBeixedon
Sabrina Brooks	Graphic Design	Kenneth FitzGerald, Ivanete Blanco & David Shields
Eleazar Sunglao	Graphic Design	Kenneth FitzGerald, Ivanete Blanco & David Shields
Katelyn Curtis	Painting	Elliott Jones
Elizabeth Goebel	Painting (Drawing & Design)	Elliott Jones
Christina Irizarry	Painting (Drawing & Design)	Elliott Jones
Dave Laperrier	Painting	Elliott Jones
Joseph Colon	Print & Photo Media (Photography)	Greta Pratt
Roland Felipe	Print & Photo Media (Photography)	Greta Pratt
Mary Morris	Print & Photo Media (Photography)	Greta Pratt
Shea-La Gatz	Print & Photo Media (Printmaking)	Ken Daley
Meghan Leach	Print & Photo Media (Printmaking)	Ken Daley
Justin Salas	Print & Photo Media (Printmaking)	Ken Daley
Kerry McGeein	Metals	Dianne deBeixedon, Jane Ritchie
Brett Baril	Metals	Dianne deBeixedon, Jane Ritchie
Kaitlyn Hennessy	Sculpture	John Roth
Jack Van Dyke	Sculpture	John Roth
Casey Rowan	Sculpture	Peter Eudenbach
Christine Hammett	Sculpture	Peter Eudenbach

8:00 AM-12:30 PM (Learning Commons: Northwest Atrium)

Poster Session

Real Time Multi-Class Facial Expression Recognition For Therapeutic Aid In Autism Spectrum Disorders

Megan Witherow and Tucker Wash (Mentor: Dr. Khan M. Iftekharuddin)
Electrical Engineering

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social-emotional reciprocity, nonverbal communication, and relationship building. Earlier studies report oddity as lack of natural traits in the facial expressions of affected individuals. The development of therapeutic tools to train and correct oddity in facial expressions may help children with ASD overcome related challenges in nonverbal communication. The goal of this project is to develop a real-time software application for recognizing facial expressions from live video feed to supplement a research platform for studying the efficacy of robot-mediated intervention in children with ASD.

Training of CSRN

Bryan Brevard (Mentor: Dr. Khan M. Iftekharuddin)
Electrical Engineering

In the past decade researchers put significant effort to solve complex problems using Artificial Neural Networks (ANNs). A unique type of ANN known as a Cellular Simultaneous Recurrent Network (CSRN) has shown excellent performance for solving complex topological mapping problems such as maze traversal. However, the complexity of CSRN architecture makes it very hard to train. Researchers in ODU's Vision Lab have improved the training by introducing Unscented Kalman Filter (UKF) algorithm but it is not yet real time. In this research we plan to implement CSRN in a hardware platform to achieve real time performance for large scale problems.

Software Defined Radio Implementations for HDTV Receivers

Peter Oelslager (Mentor: Dr. Dimitrie C. Popescu)
Electrical Engineering

The poster presents research on digital modulation techniques currently in use for high definition broadcast television (HDTV) in North America, how those signals are implemented using software defined radios (SDRs), and how are they affected by noise. The MPEG video standard along with the ATSC information transmission protocol for video and audio data has been studied, and receivers for QAM modulation schemes have been implemented on HackRF and Universal Software Radio Peripherals (USRP). Noise effects and bandwidth requirements for these two types of SDRs have been compared in the project.

Low-Cost Communication System Implementations Using Raspberry Pi and Software Defined Radio Platforms

Ntiana Sakioti (Mentor: Dr. Otilia Popescu)

Computer Engineering

The poster presents research on implementing low-cost communication systems using Universal Software Radio Peripherals (USRP) from National Instruments/Ettus Research. A Raspberry Pi single-board computer is used to program two USRP boards to act as transmitter and receiver, respectively, and to establish a radio link. Through appropriate programming the types of transmitter and receiver implemented can be changed to accommodate multiple modulation schemes and radio interfaces. A live demo of the system is also planned for presentation along with the research poster.

Challenges Of *Scenedesmus* Cultivation For Biofuels

Siobhan McFarlane (Mentor: Sandeep Kumar)

Civil Engineering

The process of lipid extraction from *Scenedesmus* calls for a sizeable amount of algae. In order to reach the extraction stage, aquaculture must first be used to grow and harvest usable algae. Through inoculation of starter bottles from a single vial of 10 mL along with consistent effort and time to continue the growth process, the end results are algal columns of sizeable means (70 litres). The current challenges of column scale-up include, but are not limited to, the presence of cyanobacteria and rotifers, which delay progress and are being further investigated in order to remove further hindrances.

Familiar Video Stories as A Means for Children with Autism: An Analytics Approach

Alexis Brueggeman (Mentor: Dr. Nikos Chrisochoides)

Computer Science

Chen et al. developed a video face replacement technology, which presents a unique and individualized video to a child with Autism Spectrum Disorder (ASD) that includes familiar faces and places. With this technology, it was found that the personalized videos encouraged children with ASD to express more positive emotions during a novel experience. In order to ascertain how much of the desired information was actually gleaned from watching the video social story, an existing video learning analytic system was used to determine how subjects with ASD perceived the videos. The preliminary results of this pilot study indicate the need for further investigation into how the user interface and its enhancements can provide precise information on the perception and cognition of the individuals with ASD.

Designing Mobile Educational Games for Informal Learning Environments

David Jones (Mentor: Dr. Nikos Chrisochoides)

Computer Science

This research focuses on the integration of mobile technology with STEM education in “informal learning environments,” such as museums and aquaria. In this stage of a multi-year study, a game for mobile devices is being designed that instructs high school students in earth science and mathematical reasoning. The game corresponds to the “Journey of Water” exhibits at the Virginia Aquarium, and can be used by students as they progress through the exhibits. The researchers used semi-structured interviews with aquarium staff and STEM education specialists to create the design guidelines. The game may potentially improve engagement and learning at such centers.

Gamma Spectroscopy Analysis Of An Unknown Photopeak

Wesley Lacaze (Mentor: Dr. Gail Dodge)

Physics

During gamma spectroscopy experiments conducted using a NaI scintillator detector an unknown peak was noticed in the background spectrum when no radioactive sources were present. This peak could potentially affect further experiments using the gamma spectroscopy detection system if the peak is either an error in the detection system or an unknown radiological source. An investigation was conducted to examine this unknown peak by establishing multiple background spectra with a calibration process using known radiological sources to determine the energy of the observed peak. Shielding experiments were also used in an attempt to determine if the source of the peak was something within the detector or being caused by an isotope in the surrounding environment. This investigation showed that the unknown peak was being produced outside of the detection system. Through research of known isotopes in the vicinity of the energy observed for the unknown peak it was shown that there is a high probability that Potassium-40 is the source of the peak. Further experiments were conducted using known Potassium sources; concentrated potassium in pill form showed a distinct increase in the investigated peak, giving a high confidence that Potassium-40 is the source of the unknown peak.

Sequence Alignment of Malware Data

Daniel Brill (Mentor: Dr. Yaohang Li)

Computer Science

Sequence alignment has been used to align DNA sequences to find matching segments of DNA from different specimens. These DNA sequences can be used to find similar patterns in DNA, this process can also be used on computer programs to identify when segments of code have been reused. Malware programs are made most of the time from other malware programs or malware templates. We can sequence align the byte information of these decompiled programs to identify them as malware from known

samples. Sequence alignment is a time consuming process but when a sequence has been found it can be used to identify malware orders of magnitude faster than the sequence alignment of two whole files.

Have Retailers Modified the Way they Sell Toys?

Sarah Brown (Mentor: Dr. Brooke Schaab)

Psychology

Research using toy catalogs during the 2014 Christmas season suggested that retailers market toys in gender specific way (Cross, Scott, and Schaab, 2015). Even more disturbing was the finding that STEM toys were almost exclusively shown with boy models. Negative feedback from parents led to retailers claiming to advertise in a gender neutral fashion this season. Research compared 2014 and 2015 advertising from 3 major retailers to determine if advertising was more gender neutral. Data collected in 2014 suggested that a young-adult population may view toys as more gender neutral. Therefore, we explored how different adult age groups classified toys.

Developing a Measure of Psychological Aggression: Stage 2

Arushi Deshpande (Mentor: Miguel Padilla)

Psychology

Current research indicates that psychological aggression can lead to physical aggression. Thus, accurate measures of psychological aggression can be used to quell future physical aggression. However, unsound psychometric properties and fragmented definitions have diminished the accuracy of current psychological aggression scales. The purpose here is to create a sound psychological aggression scale. This part of the study focused on pilot testing preliminary items written to capture behaviors that constitute psychological aggression. An analysis revealed that some preliminary items required removal because of their abnormal distributions. The next step is to field test the items to establish the factor structure of the new scale.

Developing a Measure of Internalized Homophobia/Biphobia: First Steps

Jessica Burgess (Mentor: Miguel Padilla)

Psychology

Internalized homophobia/biphobia is defined by private feelings of segregation and self hatred in relation to sexual orientation. How internalized homophobia/biphobia manifests in the lesbian, gay, and bisexual communities is pertinent due to its social consequences. However, existing scales are not inclusive of all sexual minorities and in some cases use heterosexuals. This study has two purposes: establish what thought processes define internalized homophobia/biphobia and create a scale based off this definition. To achieve this goal, focus groups from various sexual minorities will be used to provide information as to what constitutes internalized homophobia/biphobia. The focus group information will then be used to write preliminary items for pilot testing.

The ratio of human hosts among species of ticks found in the Mid-Atlantic

Cameron Lenahan (Mentor: Dr. Holly Gaff)

Biological Sciences

Ticks are ectoparasitic animals known to be vectors of various diseases known to be pathogenic to humans. In this study, we explore several species of ticks, their likelihood to use humans as hosts, and compare the results to findings of our active surveillance project. The species of ticks include the American dog tick, lone star tick, blacklegged tick, and Gulf Coast tick. We limited ourselves to obtaining data from various sites found in Virginia, Maryland, Delaware, and North Carolina. Data was obtained by flagging as well as submission from volunteers of ticks found on themselves. We found fewer American dog ticks on human hosts than lone star ticks; however, when the number of encounters is compared to the total number of American dog ticks found through flagging, the percentage skyrockets. Based on our results, we found that American dog ticks are far more likely to feed on human hosts than lone star ticks.

How sequence directs structure: My first steps to unlock the protein folding code in GB1

Brittney Ruedlinger (Mentor: Dr. Lesley Greene)

Chemistry and Biochemistry

The β 1 domain of Streptococcal protein G consists of 56 amino acid residues arranged in a two-layer alpha-beta sandwich. We are interested in understanding how the sequence encodes the three-dimensional structure of this protein. In support of this research investigation, two mutations were selected, designed and synthesized. The first is glutamic acid 42 to glycine and the second is valine 39 to alanine. The variant proteins were expressed in preparation for future experimental studies which will involve purifying the proteins as well as conducting thermodynamic and kinetic studies to elucidate the effect of the mutations on structure, stability and folding.

Program Evaluation: Participatory Evaluation Model

Kathryn Macken (Mentor: Narketta Sparkman-Key)

Human Services

This presentation will focus on utilizing participatory evaluation model in conducting program evaluation. The roles of the stakeholders in the evaluation process will be explored.

The Role of Observation in Naturalistic Program Evaluation

Jamie Anderson (Mentor: Narketta Sparkman-Key)

Human Services

This presentation will focus on utilizing observations as a method of collecting qualitative information when evaluating programs.

Objective Based Program Evaluation

Julie Snell (Mentor: Narketta Sparkman-Key)

Human Services

This presentation will focus on utilizing objective based model in program evaluation of community agencies.

Program Evaluation: Examination of Healthy Lifestyles

Anaya Porter (Mentor: Narketta Sparkman-Key)

Human Services

This presentation will focus on afters school and summer programs that focus on healthy lifestyles utilizing program evaluation methods.

Naturalistic Program Evaluation: A Review of an After School Tutoring Program

Kendra Reed (Mentor: Narketta Sparkman-Key)

Human Services

This poster will outline the research methods involved in program evaluation utilizing the Naturalistic Program Evaluation Model.

Utilizing Program Evaluation to Examine Effective Case Management Practices

Ariyan McDonald (Mentor: Narketta Sparkman-Key)

Human Services

This presentation will review the relationship between program evaluation and research methods to explore effective case management practices.

9:00-10:00 AM (ROOM 1310)
Biological Sciences I: Birds, Ticks, and Algae
Chair: Eric Walters

Diet Components of Waterfowl Wintering in Virginia

Anderson Miller (Mentor: Dr. Eric Walters)

Understanding the diets of waterfowl is critically important to the preservation and conservation of waterfowl on the eastern coast of Virginia. Diets of waterfowl have been intensely studied over the past century but the diets of Mallards (*Anas platyrhynchos*), Gadwalls (*Anas strepera*), and Canada Geese (*Branta canadensis*) have not been studied in southeastern Virginia, an important wintering stopover area for migrating waterfowl. The most common seed species found in all samples was Pennsylvania smartweed and Smith's bulrush. Waterfowl have high nutritional demands when migrating and a higher preference for natural grain because of its high carbohydrate and mineral content.

Survival Rate of *Amblyomma americanum* In Subzero Temperatures

Duke Kunzler (Mentor: Dr. Holly Gaff)

The predominant hypothesis is that ticks will survive more readily with snow cover than without if exposed to the same freezing temperatures. *Amblyomma americanum* were placed in microclimates and kept inside a freezer for up to seven days. The experimental groups without snow survived at a significantly higher rate than groups with snow.

Identifying the Plant Communities Preferred by Tick Species in Hampton Roads, Virginia

Leo Notto (Mentor: Dr. Holly Gaff)

Tick borne disease is the number one cause of vector borne disease in the United States. Understanding tick habitat is key to avoiding contact with disease. This study focused on mapping tick population density, herbaceous ground cover, and plant diversity on three different trails in Southeastern Virginia in the summer of 2015. Understanding how different tick species utilize plant communities will be important knowledge in the fight to prevent diseases.

Algal Community Composition and Water Quality in an Urban Tidal Tributary

Kathryn Wiesner*, W.S. Millman, and G. Clardy (Mentor: Dr. T.A. Egerton)

Knitting Mill Creek is an urban sub-tributary of the Lafayette River in Norfolk, VA prone to algal blooms and water quality impairments. Bloom initiation and phytoplankton succession were assessed by collecting water samples 2-3 times per week from May through August, 2015. Physical and chemical parameters (water, temperature, salinity,

pH, dissolved oxygen, Secchi depth, chlorophyll fluorescence, total nitrogen, and total phosphorus) were measured along with analyses of algal species composition. Significant heterogeneity in vertical structure was detected, with subsurface Chla 2-3x surface concentrations in some cases, indicating limitations of traditional surface monitoring. A total of 48 phytoplankton species were identified in Knitting Mill Creek during the study, dinoflagellates were the dominant group present, and among the dinoflagellates observed was the harmful algal bloom (HAB) forming species, *Cochlodinium polykrikoides*. *Cochlodinium* is responsible for extensive blooms throughout the lower Chesapeake Bay region when water conditions are favorable. *Cochlodinium* was present in Knitting Mill Creek for 10 weeks with peak blooms occurring mid-June, mid-July, and early August followed by a decrease in biomass. Further applications of this study could be used to monitor other urban tributaries to assess water quality based on algal species composition dominated by species that cause harmful algal blooms.

9:00-10:00 AM (ROOM 1311)

Facets of Physics Research

Chair: Stephen Bueltmann

Decoupling Linear and Nonlinear Regimes: An Evaluation of Efficiency for Nonlinear Multidimensional Optimization

Chris Cotnoir (Mentor: Dr. Balša Terzic)

Solving a large subset of multidimensional nonlinear optimization problems can be significantly improved by decoupling their intrinsically linear and nonlinear parts. This effectively decreases the dimensionality of the problem, reduces the search space and improves the efficiency of the optimization. This decoupled approach is generalized with mathematical formalism and its superiority over standard methods empirically verified and quantified on a couple of examples involving chi-square curve fitting to data.

Compton Scattering in the Low-Field Regime

Erik Johnson (Mentor: Dr. Balša Terzic)

I have developed a general calculation for the spectrum of photons back-scattered from photon-electron collisions. This first calculation differs from similar calculations used in models recently published in peer-reviewed journals in that it is firmly rooted in a four-vector energy-momentum analysis; this distinction is vital for working with high energy, relativistic photon-electron collisions.

Mapping De-Icing Salt Deposition on Moore Drive Bridge, Rochester, New York

Sterling Gordon (Mentor: Dr. Desmond Cook)

The Chloride percentages across the webs of the girders on Moore Drive Bridge, Rochester, New York have been determined using X-ray fluorescence. The percentage of Akaganeite (β -FeOOH) was determined through X-ray diffraction and it was found to follow the same trends as the Chloride percentage. It was found that webs of girders facing incoming traffic have higher Chloride percentages than those facing away from traffic.

Investigation of Maximum Drift Time as a Function of Gas Mixture in a Drift Chamber

Heather Hagood (Mentor: Dr. Gail Dodge)

Drift chambers are gaseous ionization detectors that are used to determine the trajectory of a particle traveling through the chamber. In this presentation, the functionality of a drift chamber in a large 5 T magnetic field was studied in the interest of preparing for an upcoming Jefferson Lab experiment to study the structure of the neutron. To examine the effect of magnetic fields on drift chambers, various drift chamber configurations were simulated using the CERN program Garfield.

Scintillator Repair and Testing for the Large Acceptance Detector

Katheryne McMahan (Mentor: Dr. Lawrence Weinstein)

Scintillation counters are used to detect fast moving elementary particles in nuclear physics scattering experiments. The scintillation counters of Jefferson Labs CLAS detector are presently being refurbished at ODU for future experiments with the Large Acceptance Detector in Hall C. Defective counters are being replaced with new ones. The methods of characterizing and testing scintillation counters and amplification photomultiplier tubes will be discussed.

9:00-10:00 AM (ROOM 1306)

***Art History Session 1: Convergence and Synthesis: Style, Media,
Philosophy***

Chair: Vittorio Colaizzi, Art Department

Fragmented: Categorization and Contextualization of Terracotta Fragments Found at Morgantina

Sarah K. Gorman (Mentor: Dr. Jared Benton)

Over 200 terracotta figurines and fragments have been unearthed in the ancient city of Morgantina. Many of these can fit into several types and none are more prevalent than the Tanagra. While the original concept of a Tanagra can be traced to Athens, the workshop in Syracuse has been credited with the creation of multiple Sicilian variants. Discovery of these variants in Morgantina suggests a creative link between the two cities. Through examination and comparison with known examples, identification and dating of these figurines is made possible. This knowledge nuances our understanding of the site and ancient stylistic exchange networks.

Humanistic Didactic Morality in Bruegel's "Netherlandish Proverbs"

Jo-Ann Estes (Mentor: Dr. Anne H. Muraoka)

"Netherlandish Proverbs" by Pieter Bruegel the Elder is a form of didactic humanistic morality. Bruegel's caricatured figures in a village landscape act out 80 to 100 individual scenes of social ills based on Greek and Latin proverbs from Erasmus' "Adages." Bruegel intended his work to encourage morality in society through the negative examples of social ills such as social inequality and deception. Interestingly, he encouraged morality without attaching it to religious subject matter. This irregularity can be explained by Erasmus' Christian humanistic influence as well as the tumultuous religious nature of the times.

Lights Out: An Examination of Edward Hopper's Surreality

Justice Kaufman (Mentor: Dr. Vittorio Colaizzi)

Edward Hopper is considered a realist, and though it is true that his ultimate goal was to depict the world as he saw it, his style is in fact much more nuanced. The nearly Impressionistic treatment of light juxtaposed with flawed geometry applied to everyday scenes activates a nearly dreamlike state that can only be described as surreal. The subsequent feeling of incongruity gives his paintings such lasting impact.

A Whole New World: The Distorted Perspective of Jeppe Hein's "Follow Me" and Anish Kapoor's "Cloud Gate."

Nicole Eaker (Mentor: Dr. Vittorio Colaizzi)

Jeppé Hein's "Follow Me" and Anish Kapoor's "Cloud Gate" utilize enlarged scaling and reflective materials to alter assumed perspective which creates a transition between the immediate environment of the piece and its surrounding space. Among art media, sculpture stands out because it is viewed in three-dimensions while remaining static. Through space manipulation by increased scale and perception-altering material these sculptors successfully create new worlds through their installations. This allows sculpture to deviate from painting's two-dimensionality providing an alternative art experience. Hein and Kapoor aim to provide an interactive experience for viewers and space to formulate new environments.

10:15-11:15 AM (ROOM 1310)

Biological Sciences II: Aquatic Sciences

Chair: Dr. Dan Barshis, Department of Biological Sciences

Calcification Rates Indicate Thermal Stress Tolerance in Belize “BackReef” Corals

David D. Jones (Mentor: Dr. Dan Barshis)

Reef-building corals host symbiotic algae known as zooxanthellae living within their tissues. Exposure to prolonged elevated temperature can cause corals to expel their symbionts and lead to coral bleaching. In this study, corals from Florida and Belize inshore reefs (high temperature variability) and offshore reefs (low temperature variability) were subjected to a 6-week-long heat stress experiment to determine if inshore corals displayed higher stress tolerance than offshore samples. Measurements of calcification rates suggested that Belize’s inshore or “BackReef” corals demonstrated the greatest growth and stress tolerance. Ongoing symbiont density measurements will provide further clues to stress tolerance.

Establishing Phylogeographic Relationships of *Symbiodinium* in Sites in Florida and Belize

Benjamin Maxie (Mentor: Dr. Dan Barshis)

Samples of *Porites astreoides* were taken from inshore and offshore reefs in the Florida Keys, as well as fore-reef and back-reef locations in Belize. DNA was extracted and the chloroplast 23S gene was sequenced from the samples in order to identify *Symbiodinium* taxonomy. All samples were most closely related to subclades A4 and A13, which were identical at the CP23S locus. A phylogenetic network was generated to show similarities and differences among experimental samples and established subclade samples taken from Genbank. The phylogenetic network as well as statistical analysis showed differences between the Florida and Belize samples, as well as differences between inshore vs. offshore and fore-reef vs. back-reef samples.

Damsels in Distress: A Preliminary Assessment of Pomacentridae Extinction Risk

Allison Roberts (Mentor: Dr. Kent Carpenter)

The family Pomacentridae is among the most diverse of the perciformes, boasting 400 different species of damselfish. These fish are found in coral reefs of varying depths around the world, most of which risk great damage due to climate change. In addition, many species are key components of the ornamental aquarium trade. Considering these threats, the importance of examining the state of Pomacentridae is paramount in examining the health of our oceans. Using IUCN Red List methods, preliminary data suggests some species of damselfish are at elevated risk of extinction.

Monacanthidae: The Importance of an Adaptable Species in a Changing Ocean

Alborz Shirmohammadi (Mentor: Dr. Kent Carpenter)

Coastlines are the bridge between human activity and marine life. Increased human activity along coastlines damages and destroys marine communities that live in these shallow waters. Monacanthidae, an adaptable coastal fish family, has shown versatility in finding complementary habitats ranging from temperate to tropical waters. The IUCN Red List of Threatened Species assessment of the conservation status of threatened species shows the Monacanthidae survivability fares relatively well compared to other families within coastal marine communities. This presentation discusses the importance of these fishes, and outlines reasons to protect and research them.

10:15-11:15 AM (ROOM 1311)
Undergraduate Research in Psychology I
Chair: Debra Major, Department of Psychology

Differences Between Men's And Women's Experiences When Transitioning Into The STEM Workforce

Kelsey Ellis and Rachel Green (Mentor: Dr. Debra A. Major)

The purpose of Project RISE (Research Investigating STEM Embeddedness) is to understand the discrepancies between men and women's experiences as Science, Technology, Engineering, Math (STEM) majors by following them in their transition into workforce. Participants were interviewed 3 months after entering their job or graduate program and were asked about their experiences in the field. These responses were then analyzed to investigate how embedded STEM graduates are in their entry level positions. This presentation will address differences in student's transition to post-graduation roles based on the type of position (i.e., graduate school vs workforce) and gender.

A Methodological Study Of The Use Of "Aha!" Ratings In Research On Insight Problem Solving And Creativity

Alonzo Anderson, Aekta Javia, Joesph Abijaoudi, Holly Fizgerald, Won Valerius, and Chelsea Dilks (Mentor: Dr. Ivan K. Ash; Graduate Student Mentor: Kimberly Lee, M.S.)

Creativity is often associated with people experiencing sudden flashes of inspiration and understanding. These type of experiences have been called insights or "Aha!" moments. "Aha!" moments or insightful solutions are often described as answers that suddenly appear in the mind, with little effort, and extreme confidence that the answer is correct. This can be contrasted with incremental or analytically solved problems where solutions are reached through effortful, deliberate, and strategically application of prior knowledge. Researchers have often used subjective ratings of participants' own "Aha!" experiences to differentiate between insightful and incrementally solved problems. In the current study we investigated the construct validity of these Aha! ratings, by presenting participants with the three different aspects of the "Aha!" rating (Suddenness, Effort, and Confidence) as separate measures to see if these aspect of the solving experience were highly correlated.

Academic Performance and Help Seeking Among College Transfer Students

Sarah Brown (Mentor: Dr. Konstantin P. Cigularov)

College transfer students make up over a third of the total student population and their numbers are continuously growing. Although transfer students are likely to experience academic adjustment challenges at their new institution, there has been little research on the relationship between help-seeking and academic performance among college

transfer students. In the present study, we investigated differences in help seeking between low (< 2.0) and high (> 3.5) GPA transfer students, and the effects of gender on help-seeking and GPA. Participants were 157 transfer students, most of them in their second semester at their new institution, who complete a web-based, anonymous survey. There was no significant difference between the low and high GPA groups in terms of the number of sources for help the students sought when faced with a university-related problem. When we examined specific sources for help, high GPA transfer students were more likely to seek help from faculty than low GPA transfer students; the other sources (i.e. academic advisors, other students, friends or family, tutors, and university counseling center) had similar likelihood of being sought out by both groups. Female and male transfer students reported similar likelihood for seeking help in terms of number of sources and type of source. Our findings suggest that seeking help from faculty is a useful strategy distinguishing high from low performing transfer students. Therefore, higher education institutions should encourage faculty to engage students and build rapport, and also provide opportunities and encourage students to engage with faculty.

10:15-11:15 AM (ROOM 1306)

Art History Session 2: *The Subject and Society: Negotiating Conventions*

Chair: Dr. Anne H. Muraoka, Art Department

Oh, Susanna: Exploring Artemisia's Most Painted Heroine

Kerry Kilburn (Mentor: Dr. Anne H. Muraoka)

Artemisia Gentileschi (1593-1656?) was a rare female Baroque artist who successfully established herself in the field of narrative history paintings. Her work included several series of paintings representing variations on a single theme. Her "Susanna and the Elders" series is unique among these: it contains the largest number of paintings executed over the longest period of time with no repetition of image types. This series exemplifies Artemisia's practice of portraying heroic female protagonists and her narrative originality. Her potential identification with the character of Susanna moreover has allowed Artemisia to create a series of rare insight and nuance.

"I'm Starting with the Man in the Mirror": Albrecht Dürer's Self-Portraits Reconsidered

Lindsay Brown (Mentor: Dr. Anne H. Muraoka)

Albrecht Dürer's oeuvre is replete with a considerable volume of self-portraits. When considering Dürer's self-images many art historians neglect a fundamental aspect required for properly reading the artist's work: the societal impact derived from the undulating religious climate of Dürer's epoch. Previous oversight of religion's significance has left many chasms in the interpretations of Dürer's self-renderings. This paper examines selected works by Dürer, diary excerpts and letters, along with concurrent rifts in German spiritual doctrine to establish religious dogmas held by the artist ultimately leading to a pellucid interpretation of Dürer's self-portraits as statements of the artist's conviction of faith.

Diego Velázquez: The Glorification of State and Self

Justice Kaufman (Mentor: Dr. Anne H. Muraoka)

Diego Velázquez actively secured a reputation by exploiting one theme, "the concept of glory," and its application to the two central elements of country and career. The first of these, the glorification of state, is found in the colossal *Surrender of Breda* while his later painting *Las Meninas* serves as a tribute to himself and his career. Both of these paintings indicate that Velázquez became increasingly preoccupied with his status as an artist. To that end he utilized original methods as well as borrowed elements from other great canvases in order to elevate the presentation of skill in his art.

When Will You Marry?: Gauguin, Orientalism, Sexuality, and Women

Jo-Ann Estes (Mentor: Professor Martha Wyatt)

When Will You Marry? by Paul Gauguin is a statement of Gauguin's views about the "civilized" West, the "uncivilized" Orient, women, sexuality, and oppression. Through the juxtaposition of two young Tahitian women, Gauguin expressed his view that the West was a corrupted civilization in regard to sexuality, specifically that European cultures were sexually oppressive of women. In contrast, he found non-western "primitive" societies such as Tahiti to be closer to his ideal of humanity because women in these cultures enjoyed sexual freedom. This work thus represents a rejection of the widely held views of European cultural superiority.

Tagged: Assigning Authorship to Figural Graffiti in Ancient Pompeii

Sarah K. Gorman (Mentor: Dr. Jared Benton)

While graffiti is an inevitable part of any modern cityscape, it is not a modern convention. Examples of man's desire to write on walls can be found as early as the Paleolithic Era. Thus it is not surprising that large amounts of graffiti, both figural and textual have been discovered in the ancient city of Pompeii. Most scholarship attributes these inscriptions to elite, albeit naughty schoolboys, however, this narrow interpretation neglects the copious amounts of graffiti discovered throughout homes and along the city's walls. Through examination of these drawings, it becomes evident their artists comprise the totality of Pompeian citizenry.

11:30 AM -12:30 PM (ROOM 1310)
Biological Sciences III: Microbiology
Chair: Dayle Daines, Department of Biological Sciences

Characterization of a toxin-antitoxin locus in *Acinetobacter baumannii*

Michaela Frost (Mentor: Dr. Dayle Daines)

Toxin-antitoxin (TA) systems are mechanisms of survival in many species of bacteria. In nontypeable *Haemophilus influenzae* (NTHi), the type II TA gene pair vapBC-1 encodes the VapB-1 antitoxin protein and the VapC-1 ribonuclease toxin. This locus contributes significantly to NTHi's survival and virulence during infection. Orthologues of vapBC-1 are present in the Gram-negative bacillus *Acinetobacter baumannii*, a causative agent of nosocomial infections. In this study, we hypothesized that protein homologues of VapB-1 and VapC-1 in *A. baumannii* would interact similarly as those in NTHi. We also investigated whether the VapCAB toxin protein had ribonuclease activity and led to growth arrest.

Analyzing phylogenetic relationships of bacterial strains in *Mycobacterium marinum* using ortholog clustering

Dillion Matthews (Mentor: Dr. David Gauthier)

Mycobacterium marinum is a species of bacteria known for its ability to cause fish and zoonotic infections in aquaculture. Phylogenetic analysis of 32 strains of *Mycobacterium marinum* revealed a clade organization based on host. The strains that were isolated from a broad range of hosts, including humans, fish, and amphibians, formed clade I; those isolated entirely from fish grouped together in clade II. Within clade II, a subgrouping of strains infecting solely hybrid striped bass was termed the KST-clade. The evolutionary paths of these clades were analyzed and compared through ortholog clustering. Each clade's core genome was defined as the genes present in every strain of a particular grouping. These cores were compared to the entire collection of genes in all 32 strains to determine the presence of genes exclusive to each clade. No such genes were found in clade I, but clade I and KST groupings possessed 7 and 13 respectively. Of these genes, almost all code for functions that have yet to be determined. Further investigation is necessary to determine whether these hypothetical proteins actually play a role in the selection for fish or striped bass hosts in these groupings.

Examining Positive Selection in *Mycobacterium marinum* genomes

Miranda Ryan (Mentor: Dr. David Gauthier)

Mycobacterium marinum, infects multiple poikilothermic and endothermic species, and can produce zoonotic infections. Comparative analyses of *M. marinum* isolates revealed two apparent clades, clade I, a mix of human, fish and reptile/amphibian isolates, and clade II, comprised almost exclusively of fish isolates. A sub-clade of clade II, the KST

clade, is composed of strains isolated exclusively from hybrid striped bass. To analyze clade II and the KST clade, rates of nonsynonymous to synonymous mutations (dN/dS) were calculated. Analysis of results from dN/dS analyses may reveal virulence and host selection of isolates characteristic to specific *M. marinum* clades.

11:30 AM -12:30 PM (ROOM 1311)
Undergraduate Research in Psychology II
Chair: Michelle Kelley, Department of Psychology

Kids on Drugs: Parenting Practices and Substance Use among Children of Substance-abusing Parents

Rebecca A. Price (Mentor: Dr. Michelle L. Kelley)

This presentation will examine both mothers' and fathers' psychological control, knowledge of youth whereabouts, activities and peers, and acceptance as related to depressive symptoms and substance use (i.e., alcohol and marijuana) among children of substance abusers. After controlling for child age and fathers' knowledge of youth, mothers' knowledge of youth whereabouts, activities, and peers contributed to lower depressive symptoms which contributed to less likelihood of ever having tried alcohol and marijuana. Controlling for child age and fathers' parenting, mothers' use of psychological control and acceptance contributed to lower depressive symptoms which contributed to less likelihood of ever having tried alcohol.

Does Poor Mental Health Influence Parenting Behavior among Substance Use Disorder Parents? An Examination across Father Only and Dual Couples with a Substance Use Disorder

Tyler D. White (Mentor: Dr. Michelle L. Kelley)

This presentation will examine father only and dual parent substance abuse on parents' reports of depression, anxiety, and hostility, and their children's reports of mothers' and fathers' acceptance, psychological control, knowledge of youth's whereabouts. Controlling for mothers' mental health symptoms, fathers' depressive symptoms and anxiety were associated with higher maternal knowledge of children's whereabouts. Controlling for fathers' mental health symptoms, higher reports of depression, anxiety, and hostility for mothers were associated with lower paternal knowledge of children's whereabouts. Other findings demonstrated the importance of parents' mental health symptoms by family type for parenting, especially father only families with substance use.

Impacts of Beliefs and Personality on Ratings of Technology-Mediated Interviews when that Technology Malfunctions

Rachel E. Green (Mentor: Dr. Richard N. Landers)

Videoconferencing technology is used frequently by organizations in the interview process because it offers increased convenience in comparison to face-to-face interviews; however, little research has examined the impact of malfunctions during such interviews. This study examined the effect of technology malfunctions on ratings of interviewees by experimentally assigning participants to view a recording of either a

pristine videoconference interview or a recording of the same videoconferencing interview with addition of technology malfunctions. Participants' locus of control and prior beliefs about videoconferencing were hypothesized as moderators of the relationship between technology malfunction and ratings of the interviewee in the recorded interview.

HIT Me Baby, One More Time: Optimal Worker Incentive Strategies for Human Intelligence Tasks on Amazon Mechanical Turk

Julia L. Brigden and Andrew B. Collmus (Mentors: Dr. Richard N. Landers and Dr. Tara S. Behrend)

The use of crowdsourced human intelligence tasks (HITs) is increasing in research and business, with Amazon Mechanical Turk (MTurk) being one of the most popular platforms connecting workers and requestors. Despite this popularity, data on optimal strategies to minimize attrition and maximize data quality is lacking. This study assesses the effects of different payment strategies on worker participation, speed, effort, and retention in HITs. MTurk workers were recruited to participate in a multi-wave study on personality, values, and behavior. Multiple payment strategies were developed with total payment for both phases ranging from \$1.00 to \$10.00 across experimental conditions. Results and implications will be discussed.

11:30 AM -12:30 PM (ROOM 1306)
Drawing and Digital Animation
Chair: Elliott Jones, Art Department

Melissa Griffis (Mentors: Elliott Jones & Konrad Winters)

Student will speak on how the technique of rotoscope was used in combination with traditional and digital drawing methods to produce a short animation. She will also talk about the research that went into the project. Her animation will be shown at the end of her talk.

Eirene Espinoza (Mentor: Elliott Jones)

Student will speak on her use of traditional and digital drawing methods in combination with elements of animation to produce architectural renderings inspired by mundane objects. She will talk about her background in interior design as well as the research that went into the project. Her animation will be shown at the end of her talk.

Stefan Hancock (Mentor: Elliott Jones)

Student will discuss his revisiting of the de Stijl Art Movement using computer generated 3D images and animation. From his research, he will talk about the nature of the movement and how he used 3D modeling and animation software for the project. His animation will be shown at the end of his talk.