Feb 7th, 2:45 PM - 3:45 PM

Student Award Winners Session

Ivan Ash
Old Dominion University

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 Mulholand), 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.