

19th Annual Summer Student Research Symposium



**July 30th, 2021
Online Event
College of Science & Mathematics
University of the Virgin Islands**

Nineteenth Annual Summer Student Research Symposium

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Friday, July 30th, 2021
University of the Virgin Islands
Online Event via Zoom

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Event Organized by:

Emerging Caribbean Scientists (ECS) Program
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*Emerging
Caribbean
Scientist*



Emerging Caribbean Scientists (ECS) Programs increase research training and promote excellence for STEM (science, technology, engineering, and mathematics), psychology, and nursing students at the University of the Virgin Islands.



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SCHEDULE

Session 1: STEM Education, Psychology & Social Science

Moderators: Lavidia Rogers & Karyl Askew

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- 1:00-1:10 pm Introduction
- 1:10-1:20pm Youth Development and Career Choices by Tyler Finch and Fatima Suid
- 1:20-1:30pm How Can Understanding the Soul of Leadership Stimulate STEM Students' Success at HBCU? by Donna Archer
- 1:30-1:40pm Are Mood and Resilience Associated to Subjective Memory in Older Adults? by Alexanne Carr
- 1:40-1:50pm UVI Students' Strategies for Navigating Disasters: "Getting Educated" through the 2017 Hurricanes and COVID-19 by Angelisa Freeman
- 1:50-2:00pm Developing and Evaluating Self-Guided Science Experience Tours at Etelman Observatory by Nikita Beck
- 2:00-2:10pm UVI Growth Model Impact on Student's Growth Mindset in STEM by Briana Cromwell
- 2:10-2:20pm Closing Remarks

Session 2: Biomedicine & Community Health

Moderators: Neelam Buxani & Laesha Hobson

Zoom Meeting ID: 970 8300 7564

- 1:00-1:10 pm Introduction
- 1:10-1:20pm Propofol Anesthesia Disrupts Stimulus-Induced Intracortical Coherence by Jordina Pierre
- 1:20-1:30pm Got Lead? An Assessment of Lead, Concentration in Cistern Water in St. Croix, USVI by Esonica Charles and Akilah Hodge
- 1:30-1:40pm Dementia: Psychosocial Interventions by Karla C. Williams
- 1:40-1:50pm An *In Silico* Investigation For More Effective COVID-19 Drug Candidates by LeAnn Horsford and T'Leah Serieux

1:50-2:00pm The Relationship among Discrimination, Anxiety, and Subjective Cognitive Change in Black Seniors residing in Boston, MA, and St. Croix, USVI. by Ashley T. Challenger

Session 3: Physics, Computer Science & Technology

Moderators: Aaron Rapp & Diana Bowen

Zoom Meeting ID: 987 4490 1516

1:00-1:10 pm Introduction

1:10-1:20pm Practical Measures to Reduce Public Network Exposures by Javier Galiber

1:20-1:30pm Approximating the Heat Equation Using Coding by Khaysaun Vanterpool

1:30-1:40pm The Status of Internet Security in the USVI by Kiandre Rogers

1:40-1:50pm Looking for Optical Astronomical Transients with the Etelman Observatory by Rickila Hanley

1:50-2:00pm Signal Peak Fitting and Analysis by Joel Mwambungu

2:00-2:10pm Developing and Evaluating Mobile Robotic Experience at Etelman Observatory by Sheneka Patrick

2:10-2:20pm Closing Remarks

Session 4: Marine Biology & Environmental Science

Moderators: Genae Gonsalves & Verleen McSween

Zoom Meeting ID: 955 0560 0786

1:00-1:10 pm Introduction

1:10-1:20pm Improving Coral Mortality Rates Using Iodine Baths by Amanda Boissiere

1:20-1:30pm Condition Assessment of Out Planted and Wild Coral at One of Cramer's Park's Patch Reefs by Chloe Camacho and Samuel Gittens

1:30-1:40pm Environmental Factors Affect White Mangrove Germination by VerNele Callwood

- 1:40-1:50pm Phase III: Air Pollution Sensor Expansions and LoRa Range Mapping for Low-cost Self-sustaining Climate Monitor Stations by Ne'kye George
- 1:50-2:00pm Can Sargassum be Used to Create an Organic, Low-cost Fertilizer for Retail? by Jackeima Flemming
- 2:00-2:10pm Ground-Dwelling Arthropods of St. Croix and its Offshore Cays by Jahnyah Brooks
- 2:10-2:20pm Solid Waste Management: Mapping the Optimal Bin Sites in St Thomas by Jaiel Wyllis
- 2:20-2:30pm The Growth Rates for Micro Fragmented Corals of Different Species by Kahlifah Powell
- 2:30-2:40pm Herbivores vs. Algae in Coral Nursery Tanks by Makayla Carino
- 2:40-2:50pm Benthic Surveys of Seagrass and Algae in the St. Thomas East End Reserves by Michael Caracciolo and Keedencia Harris
- 2:50-3:00pm Closing Remarks

ABSTRACTS

How Can Understanding the Soul of Leadership Stimulate STEM Students' Success at HBCU?

Donna Archer

Mentor(s): Dr. Karyl Askew and Nisha Clavier

Co-Author: Mentor's Aid

CASL (The Center for the Advancement of STEM Leadership), University of the Virgin Islands (Albert A. Sheen Campus), and Ultimate Medical Academy

Leadership is not an accumulation of skill...but is rather an introspective journey that uses emotional intelligence to build educational experiences, character, health, and successful achievement of personal, financial, and academic goals. However, some minorities who suffer from psychosocial issues, socioeconomic disparities, and financial inequality may not have the same luxury to learn in an intellectually stimulating environment as individuals who stem from affluent households... Understanding the soul of leadership addresses such discrepancies and diversifies the attainability of STEM education to any individual, regardless of socioeconomic status, by exposing psychosocial interventions that can be utilized to stimulate the engagement, cognitive retention, leadership, and health of STEM students as they embark on their academic journeys to success at HBCUs. Ancillary, the study examines risk factors that affect leadership such as psychosocial disorders, socioeconomic disparities, and introduces information from literature reviews and open-ended question surveys as instruments that STEM students can apply as daily practices to improve cognitive retention and success rates in STEM. Literature reviews and open-ended survey questions were used to complete this research. The survey was completed by a sample of a population of students and staff that attend the University of the Virgin Islands and Ultimate Medical Academy. In conjunction to these methods, the research conducted was qualitative and empirical and used a holistic to study the ontology and epistemology of participation in STEM. I'd like to thank you so much ECS and CASL for granting me an opportunity to study this subject during this summer.

Keywords: ontology, health, cognitive retention, improving long-term memory, psychosocial interventions, learning, resilience; broadening STEM education

Acknowledgement: Funding and Grant Information - NSF HBCU-UP ACE
Implementation Project: The UVI Growth Model Grant Award number: 1623126,
Program - SURE, Institution/Agency Collaborating - CASL

Developing and Evaluating Self-Guided Science Experience Tours at Etelman Observatory

Nikita Beck

Mentor(s): Dr. Lev Horodyskyj

Etelman Observatory

Informal education is an interesting way of showing how science exists outside the classroom. The presence of a research telescope in the Virgin Islands is an interesting concept that instantly captures the childhood wonder of people of all ages, and we can capitalize on that. The Etelman Observatory is staffed by a small group of working scientists who cannot simultaneously meet the demand of their work and burgeoning tourist interest. To combat this, a web-based self-guided tour was developed with set pieces individually focused on the cardinal directions, weather observation, astronomy basics and farming. The prototype of the experience was designed, tested and refined. This experience was developed with explicit learning outcomes that guided the creation a well scaffolded experience that was well received, but also showed the importance of proper signage, explicit directions and instructions of how to navigate the observatory.

Acknowledgement: NASA: Developing and Evaluating Self-Guided Science Experience Tours at Etelman Observatory (Grant No: 80NSSC21M0001)

Improving Coral Mortality Rates Using Iodine Baths

Amanda Boissiere

Mentor(s): Ashlee Lillis and Kristina Black

SEAS / TNC

Coral restoration is the process of rebuilding or restoring coral reefs using natural methods or by human involvement. Natural methods improve the natural quality of the reefs over time, whereas human-mediated coral propagation consists of researchers collecting samples to grow and replace species that are dying or build new reefs. One method currently being utilized is micro fragmentation, which encourages corals to grow tissue over areas where they were broken from a main colony. These coral fragments also have a faster growth rate to repair tissue.

Anecdotal evidence suggests that a bath in iodine solution will kill bacteria and may reduce coral mortality by preventing infection. In this study, we tested the success of iodine baths in reducing mortality of coral micro fragments and expected iodine to have a positive effect on survival of the fragments. To test if there is an effect of iodine on post-fragmentation mortality rate, we included controlled post-fragmentation treatments without iodine. After conducting a Chi Square power analysis to determine an appropriate number of samples, parent colonies were fragmented, randomized with half given a treatment of iodine and half for no iodine for control.

After one week, the effects of iodine treatments on frag survival were obtained by using a mixed effects logistic regression. We controlled for random effects of parents, raceways, species and number of frags. The results showed that not exposing new frags to an iodine bath has a minute positive effect on survival (OR=1.17, 95% CI=0.5-2.76). Additionally, a slightly positive correlation coefficient indicated that no iodine treatment would have the slightest improvement in survival (Point Biserial Correlation Coefficient= 0.03).

After two weeks, the results showed that not exposing new frags to an iodine bath has a much higher positive effect on survival with a broader confidence interval. (OR=149.30, 95% CI=0.01-1,512,377). Additionally, a slightly negative correlation coefficient indicated that no iodine treatment would no longer have a slight improvement in survival (Point Biserial Correlation Coefficient= -0.04).

Iodine baths are essentially ineffective in improving survivability on fragmented corals which proved the hypothesis correct that there is no difference between iodine and no iodine. However, there are some observations that were interesting to note. Survivability differs among species with the fragments of *Montastraea cavernosa* (MCAV) showing the highest number of survivors.

Acknowledgement: NSF - Supporting Emerging Aquatic Scientists (SEAS) Islands Alliance Grant Award No. 1930991

Ground-Dwelling Arthropods of St. Croix and its Offshore Cays

Jahnyah Brooks

Mentor(s): Dr. Sean Kelly and Dr. Nicole Angeli

University of the Virgin Islands, St. Thomas, USVI 00802 and Division of Fish and Wildlife, Department of Planning and Natural Resources, Government of the Virgin Islands

Arthropods are the most diverse phyla of organisms and play key roles in their ecosystems. Ground-dwelling arthropods are understudied in the Caribbean, despite being an important prey item for endangered herptiles. The objective for this study was to determine if there were differences in community composition of ground dwelling arthropods on offshore cays, where an endangered ground lizard (*Ameiva polops*) is still found, when compared to sites on the main island of St. Croix where the species has been extirpated for over 50 years. The purpose of the study is to determine if *A. polops* has a top-down effect on arthropod communities on the offshore cays and to determine if there is similar prey available on St. Croix where the lizards will be reintroduced. Pitfall traps were deployed in the field for 48 hrs and the sampling was repeated again after two weeks. A total of 3220 individuals, from 22 orders were identified in this study. No significant differences were found in arthropod communities at sites with or without lizards, although there were differences in relative abundances across sites. Hymenoptera and Diptera were the most common orders and therefore represent a potentially important energy source for lizards. This study not only contributes to a better understanding of arthropod communities across St. Croix and its offshore cays but will also be the first step in long-term sampling protocols related to a better understanding of the diet of *A. polops* and their trophic interactions with ground dwelling arthropod communities.

Acknowledgement: I would like to thank SEAS Your Tomorrow program for making this research opportunity possible.

Environmental Factors Affect White Mangrove Germination

VerNele Callwood

Mentor(s): Dr. Kristin Grimes

ECS, SURP, SEAS, VI-EPSCoR

The White Mangrove, *Laguncularia racemosa*, found in the tropics and subtropics, as well as in lagoons, estuaries and coastal zones. They provide ecosystem services such as coastline protection, pollution assimilation reduction, nursery habitat for juvenile organisms, and water purification. Mangroves can survive in waters from 0 parts per thousand (fresh water) and 90 ppt (three times the salinity of saltwater). According to two studies, the optimal salinity range is 15 ppt to 20 ppt (Leonard et.al 2021) which enables the seedlings growth (Ball, 1988). Although these studies focused on mangroves, there are not many studies and a lack of information on St. Thomas' white mangroves. This brings the question, 'Does exposure to different environmental factors (water, soil , air) affect germination time in *Laguncularia racemosa* (White Mangrove) propagules?'. White Mangrove propagules were collected from two on island locations, Vessup Bay, and Compass Point. These samples were measured, then divided into four treatments (soil, fresh water, salt water, and air), with five replicates for each treatment (A-E). Being that mangroves are exposed to these factors in their natural habitat, propagules in fresh water will have a faster germination rate than propagules exposed to other treatments. Propagules were monitored for 16 days and the collected data was analyzed using R-Studio.

Based on the linear regression model , there is a site and mass effect, both which had a p-value of less than 0.05. The overall p-value was also less than 0.05 thus, exposure to environmental factors does indeed affect the germination rate of white mangrove propagules.

Acknowledgement: VI-EPSCoR - Ridge to Reef Marine Resilience Grant 1946412

Condition Assessment of Out Planted and Wild Coral at One of Cramer's Park's Patch Reefs

Chloe Camacho and Samuel Gittens

Mentor(s): Caroline Pott

University of the Virgin Islands

The global eradication of coral reefs would have a major negative impact on the lives of all living organisms. Stony Coral Tissue Loss Disease (SCTLD) is a new threat to corals in the Caribbean. The St. Croix East End Marine Park has been trying through restoration to increase the abundance of corals since their first outplant event in 2019 at Cramer's Park. To assess the condition of the out planted corals, we utilized three universal metrics created by the Coral Restoration Consortium. The three Universal Metrics: Landscape/Reef-Level, Population-level, and Coral-level, were constructed to describe coral restoration sites in a way that can be compared among individual sites worldwide. Using the Landscape/Reef-level metric, we were able to determine the area of ecological footprint of restoration was 276.17 square meters. The Population-level metric showed us that of the 66 total out planted corals, 82% of them measured to be between 5 and 40 cm. The Coral-level metric revealed that 96.97% of the out planted coral had partial live tissue and 51.52% had 100% live tissue. In addition to assessing the out planted corals, we also compared the conditions of 16 wild diseased corals using Universal Metrics #2 and #3 over the course of 3 weeks. Of that 16-coral sample, 6 of them were treated with Amoxicillin with the hopes to halt the progression of SCTLD. In both treated and untreated groups of corals there was a negative change in the distribution of live tissue percentage.

Acknowledgements: This research was funded through the National Science Foundation/Supporting Emerging Aquatic Scientists (SEAS) Islands Alliance. (Award # 1930991). Special thanks to the St. Croix East End Marine Park (EEMP).

Benthic Surveys of Seagrass and Algae in the St. Thomas East End Reserves

Mentor(s): Kerrin Toner
Co-authors: Julia Plotkin and Danielle Olive

DPNR, STEER, DFW

Michael Caracciolo

Steer is a local organization made up of four Marine Reserves and Wildlife Sanctuaries (MRWS) located on the east end of St. Thomas. These MRWS consist of Mangrove Lagoon, Cas Cay, St. James, Compass Point salt pond. STEER works with DPNR in order to establish rules that can save these marine habitats. The goal of STEER is to Bolster Natural Resource Condition, adopt effective management, inspire the community to support and participate, fortify widespread socio-economic benefits. To achieve these goals, STEER continues to be an active part of the community by hosting local events that increase awareness, inspiring upcoming marine biologist through internships, and keeping updated through benthic mapping, research, and underwater surveying. To better understand the diversity and abundance of species in the east end reserve, we chose sample sites at random in our areas of interests to collect data from. We then used 10 by 10 grid quadrats to estimate percent coverage. By calculating diversity along with a species count, we were able to obtain data that gave us a general idea of the benthic layout of Mangrove Lagoon and Benner Bay.

Acknowledgement: DPNR, STEER, DFW, VI-ECOTOURS

Keedencia Harris

Seagrass and algae are important components of a healthy marine ecosystem. Seagrass provides food and shelter for many marine organisms, prevents sediment erosion aiding in the protection of local coastlines, and absorbs large amounts of carbon dioxide. Similar to seagrass, algae also provides food and shelter for several marine organisms. To better understand the diversity and abundance of seagrass and algae species present in the St. Thomas East End Reserves (STEER), we conducted benthic surveys at 28 random sample sites within the two bays. Using a 1 m² gridded quadrat, we measured species diversity using the Simpson Diversity Index as well as calculating relative species abundance. Through these calculations we now have a better understanding of the seagrass and algae species present in Mangrove Lagoon and Benner Bay. We are also able to look at the diversity of seagrass and algae in the area. From the results we saw that there were more species of algae, while we would find mainly two types of seagrass which was Turtle grass and Halophila at some sites. I would like to say thank DPNR, SEAS, EPSCOR and Fishery and wildlife for funding and giving me the opportunity to take part in this amazing program.

Acknowledgement: I would like to express my sincere gratitude to my mentor Kerrin Toner for guiding us through this internship. I would also like to thank the SEAS program for giving me the opportunity to be part of this program. Lastly, I would like to thank my family for all the support and encouragement.

Herbivores vs. Algae in Coral Nursery Tanks

Makayla Carino

Mentor(s): Ashlee Lillis and Kristina Black

The Nature Conservancy

The Nature Conservancy in St. Croix U.S.V.I has a closed system where the saltwater is brought in with barrels and not directly from the ocean. The saltwater is then chilled and ozonized, where the bacteria are killed before transfer into the tanks. Algae control is another task that must maintain. Algae and corals have a mutualistic as well as competitive relationship. One type of algae, Zooxanthellae, benefits the corals by producing oxygen and removing waste. In return, the coral protects the algae. In contrast, most other algae and corals compete for space, if there are too many algae, it can suffocate the coral. The goal of this research is to discover ways to keep the growth of algae at bay. We hypothesized that using herbivores and CCA (crustose coralline algae) can help in algae control. To test this hypothesis, we collected 6 Blue-Legged Hermit crabs (*Clibanarius tricolor*) and CCA near the Nature Conservancy coral innovation hub. The Blue-Legged Hermit crab is specifically used for cleaning the algae in aquariums. I created four crates using plastic racks, mesh nets, zip ties, and weights; and I placed the crabs into $\frac{3}{4}$ of the crates (1crab in the first crate, 2 in the second crate, 0 in the third, and 3 in the fourth crate). This experiment ran for 1 week and was observed daily. I recorded the algae coverage before and after the crabs were added using a homemade grid petri dish. CCA can outgrow nuisance algae like green algae as well as diatoms. CCA acts like cement binding the reefs together allowing them not to break during intense wave action. The CCA is chipped away and placed on the top and bottom of 10 plugs (5 for top and 5 for bottom). CCA will take at least a year for it to cover the entire plug. These plugs will be ready for future studies on algae control. We observed, through ANOVA that between the four treatments, there were no significant differences (P-value: 0.129). Before and after algae count, we used a paired T-test a, where there were significant differences (P-value: 0.000553). To conclude, our results showed that the number of hermit crabs did not impact algae control. However, external factors helped in the reduction of the algae before and after the experiment. Continuous future studies will determine if the herbivores or the CCA is the best to use for algae control.

Acknowledgement: NSF - Supporting Emerging Aquatic Scientists (SEAS) Islands Alliance: Award No. 1930991

Are Mood and Resilience Associated to Subjective Memory in Older Adults?

Alexanne Carr

Mentor(s): Dr. Aletha Baumann and Dr. Karin Schon

Co-Author(s): Michael Rosario, Azriel Williams, and Ashley Challenger

University of the Virgin Islands and Boston University School of Medicine

As of 2015, in the United States, about 15 percent of non-institutionalized men and women 65 years and older are living with some form of dementias. By 2030, there is projected to be upwards of 73 million people 65 years and older in the United States. The increasing population of older adults amplifies the need to better understand subjective memory and the variations to objective memory. Subjective cognitive complaints have been shown to be associated with depressive symptoms in older adults, but not an immediate indication of actual cognitive decline. An existing relationship between higher levels of resilience and a greater access to emotional and psychological support makes resilience an intriguing study variable among an aging Caribbean population. This study is looking to see if associations exist among subjective memory, mood, and resilience in older adults. This study is using data collected in a larger study being conducted at Boston University School of Medicine that is funded by the Alzheimer Association. Subjective memory will be measured using the "Subjective Memory Questionnaire." Mood will be measured using the "Geriatric Depression Scale." Resilience will be measured using the "Brief Resilience Scale." Recruitment of potential participants has been thoroughly outlined and is currently ongoing; interested people will need to be 50-80 years, fluent in English, reside on St. Croix, and identify as African American or European American. All data are collected remotely to respect and encourage social distancing practices during the ongoing COVID-19 pandemic. A multiple linear regression model will be used to analyze the association of my variables.

Keywords: subjective memory, mood, resilience, older adults

Acknowledgement: Alzheimer's Association - AARG-17-529566 and NIH RISE – Building Students' Identities as Scientists 2R25GM061325-16

The Relationship among Discrimination, Anxiety, and Subjective Cognitive Change in Black Seniors residing in Boston, MA, and St. Croix, USVI.

Ashley T. Challenger

Mentor(s): Dr. Aletha Baumann and Dr. Karin Schon

University of the Virgin Islands

Subjective cognitive change within this study explores the self-perception of personal memory function in older Black individuals who may or may not suffer from anxiety or experienced racial discrimination. This study will attempt to determine any associations between the perception of change in older Black individual's and their experiences with discrimination and anxiety. Racial discrimination is the most prominent form of discrimination against African Americans in the United States; with the occurrence of discrimination amongst Blacks increasing the likelihood of reliving past trauma with every new resurgence of racial injustice. An individual's experience with discrimination may lead to a slew of psychiatric and mood disorders, like anxiety and depression. This study will examine data collected from the Boston University-led study "*Perceived Racism as a Chronic Stressor and Cognition in Black Seniors.*" Participants are required to fall within the age range of 50 to 80 years, speak fluent English, and be available on St. Croix for the duration of the study. This study will analyze the responses to experiences with racial discrimination, the symptoms and severity of anxiety, and each individual's perception of their memory function. Individuals are being recruited through flyers sent to medical offices, governmental agencies, frequently visited public spaces, churches, and the community electronic billboard. The Experiences of Discrimination (EOD) questionnaire was used to determine how individuals were treated and their response; the Beck Anxiety Inventory (BAI) was used to determine symptoms and their occurrence throughout the span of weeks and the Subject Memory questionnaire was used to assess the perception of memory.

Keywords: discrimination, anxiety, subjective cognitive change

Acknowledgement: Alzheimer's Association - AARG-17-529566 & NIH RISE – Building Students' Identities as Scientists 2R25GM061325-16

Got Lead?
An Assessment of Lead, Concentration in Cistern Water in St. Croix, USVI

Esonica Charles and Akilah Hodge

Mentor(s): Bernard Castillo II, Ph.D.

Co-Authors: Samira Abed and Dazonte Mathurin

University of the Virgin Islands

Lead (Pb) has been used for centuries in pipes for water systems, color pigments, make-up and silverware. In 1978, the US Congress banned lead-based paint for home usage. Lead is a very toxic substance that affects both children and adults. Some symptoms of lead poisoning include abdominal pain, difficulties in concentration, and fertility issues. The objective of our study is to collect water from cisterns and determine the lead concentrations. We collected water samples from seven residential locations from May to July 2021 in St. Croix, US Virgin Islands. We hypothesized whether sites east or west of the refinery have differences in lead concentration. The LeadTrak™ Fast Column Extraction Method was used to determine lead levels and the results were reported as parts per billion (ppb) Pb. Our results showed that there was a statistically significant difference between lead concentration in both sites as demonstrated by one-way ANOVA ($p = 0.032$). Sites east of the refinery had lead concentrations from 0 to 3 ppb with an average of $0.73 \text{ ppb} \pm 1.01$ from May to July 2021. Whereas, sites west of the refinery had ranges from 0 to 6 ppb with a mean of $2.43 \text{ ppb} \pm 2.07$ during our collection dates. In conclusion, our study showed that concentrations of lead in cistern water in the west were higher compared to those of the eastern sites. None of the samples collected has surpassed the action level of 15 ppb as set by the EPA.

Acknowledgement: NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Award No. 1623126

UVI Growth Model Impact on Student's Growth Mindset in STEM

Briana Cromwell

Mentor(s): Dr. Nadia Monroe

University of the Virgin Islands

As the only college institution in the Virgin Islands, the University of the Virgin Islands must maintain a particular academic standard. To accomplish this while ensuring the success of its students, the UVI Growth Model was proposed. According to Tinto's models of student retention and persistence, social integration and academic integration are predictors of students' success in completing their degree (Tinto, 1993, Tinto, 1997). UVI used the Tinto Model to frame the Comprehensive Approach to Retention and Persistence (CARP) program focused on the retention and persistence of STEM majors. Findings from the UVI CARP program include: 1) strengthened academic integration through enhancing students' research perspectives and offering programs that improve students' scientific skills and 2) strengthened social integration by faculty mentors who hold high expectations of students and provide support and encouragement (Blackmon, 2013). The College of Science and Mathematics improved retention rates, with a recent cohort realizing a 91% retention rate versus UVI's 75% overall rate (Blackmon, 2019). Graduation rates for STEM majors had increased by six percentage points and currently hovers near 30%, versus UVI's overall six-year graduation rates of 22 to 26%(Blackmon, 2019). This model addresses a way to integrate and analyze academic and social activities through the implementation of courses and student support services (PLTL, Academic Coaching, Sophomore Boost) along with the integration of growth mindset curricula activities for students and the preparation of faculty towards the use of a growth mindset in their instructional delivery. Future studies must focus on strengthening student growth mindsets prior to college enrollment to better improve student success and retention in STEM majors.

Acknowledgement: NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Grant Award No. 1623126

Youth Development and Career Choices

Tyler Finch and Fatima Suid

Mentor(s): Howard Forbes Jr. and Jarvon Stout

University of the Virgin Islands

Youth Ocean Explorers (YOE) is a four-week marine science-based summer program, specifically reaching students from grades seven through twelve, while also providing mentorship opportunities for college-level students in the Virgin Islands. The main goal of this program is to provide a unique and engaging summer enrichment experience for youth that highlights and increases their interest in pursuing careers within the geosciences. The geosciences are among some of the least diverse fields in STEM (Science Technology Engineering and Mathematics) and through YOE and its utilization of best-practices in youth development can help to address this gap. Students complete a pre and post survey to assess their knowledge, attitudes, and commitment to various marine and environmental science topics. There is a sample size of 12 students combined from both respective programs (St. Thomas and St. Croix) . With the modified curriculum developed for YOE this year, we expect to see a 25-40% improvement from their pre and post survey scores. Additional in-program assessments are utilized to gauge shifts in student interest in marine biology and their likelihood to pursue careers within this field.

Acknowledgement: SEAS Alliance and Emerging Caribbean Scientists Program

Can Sargassum be Used to Create an Organic, Low-cost Fertilizer for Retail?

Jackeima Flemming
Mentor(s): Kristina Edwards

DPNR-CZM

The natural sargassum phenomenon is becoming a nuisance in the Virgin Islands and the Eastern Caribbean. The effects of beached, decomposing sargassum negatively impacts the VI tourism industry and the coastal environment. The current approach of removing and disposing of sargassum is not environmentally friendly or sustainable. A new and sustainable approach must be taken. The goal of this research was to determine if decomposing sargassum can be safely removed from beaches in the territory and instead of being disposed as garbage, be utilized to create an organic low cost fertilizer product for farming. As the VI is also progressively making plans to diversify the economy as part of its Vision 2040 plan, this product can potentially be used for retail.

As such the research question for this study is 'Can Sargassum be Used to Create an Organic, Low-cost Fertilizer for Retail?'. The study examined how sargassum is manually collected from Coki Point Beach, St. Thomas, cleaned, dried, and separated as mulch for gardening. Following application to garden soil, plant growth and condition were monitored. It also compared results from a survey disseminated to 15 shoppers at the Garden Center at Home Depot, the sale amount and frequency of their most popular organic fertilizer to compare cost and efficiency. The results indicated that clean nutrient rich sargassum can be used as organic fertilizer in farming/gardening. Most individuals would prefer a local cheaper alternative fertilizer to what they are currently using.

Acknowledgement: SEAS Islands Alliance

UVI Students' Strategies for Navigating Disasters: "Getting Educated" through the 2017 Hurricanes and COVID-19

Angelisa Freeman

Mentor(s): Dr. Michele Guannel

University of the Virgin Islands

The United States Virgin Island's (USVI) education system includes diverse public and private schools, and the University of the Virgin Islands serves as the only post-secondary institution. Recently, numerous disasters have challenged the finite educational resources and communities of the USVI. While the 2017 hurricanes negatively impacted the territory, our previous research highlighted that IrMaria survivors demonstrated unity, leadership, and post-traumatic growth. Now, since the COVID-19 pandemic uprooted educational systems worldwide, the aim of the current study was to understand how UVI students navigated the educational disruptions brought by both the 2017 hurricanes and the pandemic. Participants in this study were recruited from UVI's SCI 100 course, a general education science course, who consented to have their assignments analysed for broad themes. Students' assignments were de-identified by the Principal Investigator before analysis for this project. A total of 51 consented essays were reviewed, 26 from Fall 2019 (pre-COVID), 13 from Fall 2020 and 12 from Spring 2021 (post-COVID). A phenomenological approach was used to describe common and unique responses of students, after their formal schooling was disrupted by the 2017 hurricanes and COVID-19. Student experiences identified individual, interpersonal, and systemic impacts of disaster on education. Results showed that more students expressed appreciation for informal learning from hurricane disruptions, compared to learning from COVID-19 disruption. Current and future efforts should focus on combining preparedness strategies and lessons learnt in the event of being faced with multiple disasters simultaneously.

Key words: Education, disaster, phenomenological, COVID-19

Acknowledgement: ECS Honors Fund and NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Grant Award No. 1623126

Practical Measures to Reduce Public Network Exposures

Javier Galiber

Mentor(s): Timothy Kentopp

University of the Virgin Islands

In an ever-connected world, privacy concerns have grown rapidly, and not every device has equivalent protections. It is common knowledge within the IT world that connected devices like smartphones and tablets lack firewalls, leaving them exposed to outside influences. While the firewalls present in home routers can protect the user, it is only one barrier, and if it falls then, an entire home network is exposed to outside influence. If this is the case for most Virgin Islands households, what practical measures are viable for securing that environment? One probable solution is personal Domain Name Servers (DNS) to prevent common DNS exploits. A personal DNS like Pi-Hole have built in features that can block troublesome online redirections found in advertisements. Some ads can be hijacked to contain malicious payloads. There are two ways to implement a DNS in a residence or business. One requires a Raspberry Pi running Pi-Hole to operate. The Windows Server can operate inside a virtual machine on a person's laptop or a dedicated server. The Raspberry Pi is easy to use and requires no additional setup as the default tools used to block are automated. The Windows Server solution is also easy to set up but obtaining the benefits that the other provides out the box needs manual control from the user in order to block unwanted sites. However, pairing both methods can result in more efficiency and security when browsing the web.

Acknowledgement: NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Grant Award #1623126

Phase III: Air Pollution Sensor Expansions and LoRa Range Mapping for Low-Cost Self-Sustaining Climate Monitor Stations

Ne'kye George

Mentor(s): Dr. Brice Orange and Marshall Parsons

UVI Etelman Observatory

The US Virgin Islands (USVI) consist of four main islands with minimal ground water resources due to their small size and high relief. This requires residents to rely on rainwater collected in cisterns for fresh water supply. In addition, the air quality in the USVI is generally excellent, but it is periodically degraded by plumes of Sahara dust. The impact of Sahara dust and other factors on water quality in cisterns, and coastal areas remains an active field of research. The importance of improving our understanding of these impacts to water quality in the USVI are compounded when changing climate and rainfall patterns across the globe and USVI, including increased instances of drought, are taken into consideration. Since 2020, research and development (R&D) work has been ongoing at the Etelman Observatory Research Center to prototype a new self-sustaining weather station technology for direct short-to-long range line-of-sight communication of rainfall, temperature, humidity, and soil moisture data to a single central receiving station. Through this project, we LoRa range mapped the island of St. Thomas to identify sites for remote deployment of future stations with respect to the Etelman Observatory's central receiving station. We also developed front-end (python) software for the central receiving station to acquire and manage real time data from our prototype weather station, and refined the design of this unit to increase its resilience against environmental factors. Finally, commercially available technology capable of measuring particulate matter, CO₂, ozone, and volatile organic compounds was acquired to springboard future R&D activities to include the collection of air quality data by our weather stations. We detail these R&D efforts in this talk, and discuss future plans to remotely deploy and manage a network of self-sustaining USVI climate monitoring devices.

Acknowledgement: NASA - 80NSSC21M0001

Looking for Optical Astronomical Transients with the Etelman Observatory

Rickila Hanley

Mentor(s): Dr. Dario Carbone

University of the Virgin Islands

Astronomical transients are sources that are only visible for a limited period of time. The study of such sources is important because they are linked to some of the most intense and energetic events in the Universe, such as stellar explosions. In order to fully understand the origin of a transient event, a very important quantity to measure is the transient rate. I obtained a total of 605 astronomical images of the same part of the sky taken from the Etelman observatory, in St. Thomas. I calibrated the dataset and extracted information on the sources detected in my images in order to create light curves. I inspected the light curves to identify the presence of transients. Finally, I was able to calculate the transient rate from the information obtained in this project.

Acknowledgement: NASA EPSCoR program

An *In Silico* Investigation for More Effective COVID-19 Drug Candidates

LeAnn Horsford and T'Leah Serieux

Mentor(s): Dr. Neelam Buxani

University of the Virgin Islands

COVID-19 is a severe respiratory illness that is caused by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). It was first identified in Wuhan, China in December 2019. Due to the constant mutations in SARS-CoV-2 genome, there is a constant need to find new treatments for this pandemic. Our summer research project focuses on determining new effective COVID-19 drug candidates from a large number of compounds downloaded from the PubChem database. Based on a report published in "Science" journal, 4 compounds found active in inhibiting the main protease (Mpro) of SARS-CoV-2 were selected to perform an intensive virtual screening workflow. Based on structure similarity with these active compounds, 1000 compounds were downloaded from the database. These 1000 compounds were prepared in Ligprep, and filtered based on Lipinski's rule of 5. Phase program was used to generate three pharmacophore hypotheses and virtually screen the prepared compounds that resulted in 3 sets of compounds (21, 20, and 24). The crystal file of the main protease (code: 7COM) was downloaded from the protein data bank and prepared for molecular docking in the protein preparation wizard. Molecular docking was performed in the rigid receptor site of Mpro by flexibly placing compounds filtered from previous steps. Boceprevir and telaprevir were used as positive controls. Prime MM-GBSA binding energies of receptor-ligand complexes were also measured. The compound CID 145343705 showed the best docking results with -8.509 as the docking score and with all crucial non-covalent interactions. All computational calculations were performed using Schrodinger's small molecule drug-discovery suite (release 2020-4).

Acknowledgement: NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Award number: 1623126

Signal Peak Fitting and Analysis

Joel Mwambungu

Mentor(s): Dr. David Morris and Dr. Dragan Nikolic

College of Science and Mathematics, University of the Virgin Islands
Jet Propulsion Lab

CubeSats are a class of research spacecraft called nanosatellites. Curve fitting is the process of constructing a curve, or mathematical function, that has the best fit to a series of data points. A Gaussian distribution (also known as normal distribution) is a bell-shaped curve, and it is assumed that during any measurement values will follow a normal distribution with an equal number of measurements above and below the mean value. Using signal data sets generated from an oscilloscope within UVI's physics laboratory, the goal of this project is to fit the peaks of this data using peak fitting Gaussian algorithms, as well as to analyze the effectiveness of the algorithms at identifying the peaks in the data set. This project will eventually tie into the one of the greater goals of the UVI GREAT cube sat project, which is to develop a framework for the rapid detection and classification of Gamma ray burst signals to be used by a cube-sat satellite which will be built by the UVI physics department and eventually launched into space.

This research was partially funded by the University of the Virgin Islands Physics department grant #80NSSC17M0048 and a grant from the Jet Propulsion Laboratory.

Developing and Evaluating Mobile Robotic Experience at Etelman Observatory

Sheneka Patrick

Mentor(s): Dr. Lev Horodyskyj

University of the Virgin Islands

The Etelman Observatory Research Center of the University of the Virgin Islands, located on St. Thomas, aims to expand its activities for local audiences, specifically children and families, as these programs increase recognition of research that is being done at the observatory and building the profile of the institution for individuals interested in higher education. My project develops a remote-control robot with interactive activities for children and families to address the necessity for activities that engage the audiences in role-playing as researchers. These interactive activities make learning about the research done at the Observatory refreshing and beneficial as role playing leads to a convenient way of retaining information and is effective in attracting more children and families to what the Etelman Observatory has to offer. My methods consist of first building an off-the-shelf remote-control robot to gain an understanding of the mechanics and engineering that will be utilized in the learning activity. Afterwards, I developed the learning objectives that the educational materials will address, as well as the evaluation scheme to determine the effectiveness of the experience. Assembling the robot was more time-consuming than expected, as there were missing pieces and considerable amount of programming required. I am currently developing the learning activities around the robot rover and will soon begin testing the system to gauge audience reaction. Future work is needed to fulfill the outcome of this project.

Acknowledgement: NASA: Developing and Evaluating Mobile Robotic Experiences at Etelman Observatory

Propofol Anesthesia Disrupts Stimulus-Induced Intracortical Coherence

Jordina Pierre

Mentor(s): John Tauber.

Emery Brown, Ph.D.

University of the Virgin Islands ; Massachusetts Institute of Technology

Nearly 60,000 people a day undergo general anesthesia in the United States. Propofol is the most widely used anesthetic and although it is understood on a clinical and pharmacological level, the understanding on a systems neuroscience level is still developing. A critical function of anesthesia is to block the perception of sensory stimuli while undergoing surgery. Recent work showed propofol broadly disrupts intracortical communication, but it is unclear how it affects cortical response to sensory stimuli.

In previous work, Local Field Potential (LFP) data was simultaneously recorded from Utah arrays implanted in auditory, somatosensory, and cognitive areas of the cortex before and during propofol anesthesia. Auditory tones and air puffs were delivered randomly throughout each experimental session. We found the evoked response potential (ERP) to sensory stimuli was strongly altered, but not eliminated, during anesthesia. In particular, the auditory cortex continued to show a strong response, while the ERP in higher-order brain regions was more noticeably disrupted.

Oscillatory synchrony between brain regions is thought to be involved in creating channels for reliable, selective communication. Given the strong changes we observed in the evoked response during anesthesia, we hypothesized stimulus induced synchrony may also be disrupted. We tested this by computing coherence, a measure of synchrony, between pairs of electrodes from separate brain regions and found robust stimulus-induced coherence for ~1-30 Hz between all brain regions during the awake state. This coherence was virtually eliminated during anesthesia, suggesting propofol blocks transmission of sensory information throughout the brain.

Acknowledgement: CBMM, NSF

The Growth Rates for Micro Fragmented Corals of Different Species

Kahlifah Powell

Mentor(s): Dr. Marilyn Brandt, Dan Mele and Kathryn Cobleigh

Co-Author: Makeda Mills

University of the Virgin Islands

Corals are dying all over the Caribbean. Many corals in the USVI have been lost due to SCTL and many major storm events like hurricanes Irma and Maria. Marine biologists are developing ways to restore the reefs. *Micro fragmentation* is a restoration technique that involves cutting the corals into smaller pieces using a specialized water bandsaw. Focusing on the growth rates of micro fragmented coral is important because there will be an increase of corals that become out-planted to create reefs around the Caribbean. My null hypothesis was that there would be no difference in the growth rates between the three species: *Orbicella annularis*, *Montastraea cavernosa*, and *Porites astreoides*. My alternate hypothesis was that *Orbicella annularis* would grow faster than *Montastraea cavernosa* and *Porites astreoides*. I used pictures snapped by last year's intern, Makeda Mills, to measure and compare the growth among the three coral species. Three different genotypes of each coral species were measured from week one and week eight. In total, there were 54 fragmented corals in the three water tables that were analyzed. After measuring the fragmented corals, the data was a group by coral species. I subtracted the individual corals from week eight corals from the individual corals in week 1 to find the difference in growth rate. Then I used the ANOVA Single-Factor on Excel to compare the growth rate of the three species. Since the p-value was 5.75×10^{-10} , which is < 0.05 , there is a difference in the growth rates between the three species of corals. Since there is a difference, I looked at which coral species were growing the fastest by looking at the average growth rate. The *Orbicella annularis* had an average growth rate of 1.095745 cm^2 , while the *Montastraea cavernosa* had an average growth rate of 0.533453 cm^2 . The *Porites astreoides* had an average growth rate of 0.558692 cm^2 . In conclusion, the *Orbicella annularis* had the fastest growth rate, and the null hypothesis was rejected while the alternate hypothesis was accepted.

Acknowledgement: VI-EPSCoR - Ridge to Reef Marine Resilience for funding this Supporting Emerging Aquatic Scientists program (Grant No. 1946412)

The Status of Internet Security in the USVI

Kiandre Rogers

Mentor(s): Timothy Kentopp

University of the Virgin Islands

Internet security, better known as cybersecurity, has become one of the alarming topics to talk about in recent years due to the everyday reliance on the internet from billions worldwide. It is now more critical than ever that people and their information are safe while accessing the internet. If not, then systems can be corrupted due to malware, viruses, or other threats, the product of having an exposed network with unwanted visitors who steal or compromise data. The research tested the Internet security of a leading service provider in the USVI using software and resources on the web to process and collect the data. This included a GRC ShieldsUP scan, its purpose to alert the user of any ports that have been open in firewalls. Pi-Hole was configured and implemented on the local area network (LAN) to protect users from dangerous ads and trackers providing extra protection while online. Nmap scans detected each exposed network device. Used in combination, these tests determine the number of exposures for a given public network and its relative safety. Safety should always be top priority in all aspects of life, even online. It is critical that every person keep his/her information safe, so it doesn't get into the wrong hands.

Acknowledgement: University of the Virgin Islands, SURE, NSF HBCU-UP ACE
Implementation Project: The UVI Growth Model

Approximating the Heat Equation Using Coding

Khaysaun Vanterpool
Mentor(s): Dr. Aaron Rapp

University of the Virgin Islands

The Heat Equation is a partial differential equation that calculates a specific part of a substance's temperature where heat does not exist. For my ECS research, my mentor and I will be approximating this equation using programming. This study aims to observe if the dual wind discontinuous Galerkin method (advisor's new method) coupled with discretizing the time derivative results in accurate approximations to the solution of the heat equation. In the process of this research, we are using derivatives equations and the act of coding to hypothesize this study. Analysis of our finding demonstrates the smaller the approximation decreases, the closer it gets to zero. Therefore, the smaller the step size, the more exact the approximations are.

Acknowledgement: NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Grant Award No. 1623126

Dementia: Psychosocial Interventions

Karla C. Williams

Mentor(s): Dr. Diana Bowen

University of the Virgin Islands

I have been working on a literature review on dementia for the past 6 weeks with Dr. Diana Bowen. I chose dementia because it is a prevalent disease among the aging population. Caregivers play an important role in the lives of their loved ones. Psychosocial interventions can help alleviate some of the burden of care.

Caregiver burden can lead to depression, social isolation and financial hardships placed on the caregiver. According to the 4 studies I reviewed, counseling, technological, and telephone interventions can alleviate caregiver burden. With these supports, caregivers feel less of a need to place their loved ones in nursing homes because they are better able to handle undesirable behaviors. This saves the caregiver money needed to provide and manage care.

Thank you very much to ECS for allowing me to participate in this research project this Summer.

Acknowledgement: NSF HBCU-UP ACE Implementation Project: The UVI Growth Model Grant Award No. 1623126

Solid Waste Management: Mapping the Optimal Bin Sites in St Thomas

Jaiel Wyllis

Mentor(s): Dr. Gregory Guannel and Ariel Stolz

University of the Virgin Islands

There is a major issue of improper waste management occurring all around the world. The production of waste from nations worldwide is at an all-time high causing massive problems for the environment and human health. Waste removal is becoming more expensive while also more dangerous for the environment. Similar to the rest of the world, the USVI struggles with proper waste management. The USVI is even more challenging because of the terrain, extreme weather, isolated island, and other issues in the waste management system. The system is pretty impaired overall, and a lot of work needs to be done to improve waste management. There are small areas where we could improve the structure as it is now to inherit better results. This can be done by determining where we could provide additional house-to-house collection and totes/carts for the Territory to help deter illegal dumping. By providing additional bin sites and house-to-house pickups, we hope to provide everyone on the island an avenue to dispose of their trash. This would then hopefully bring down the illegal dumping of waste around the island. The main goals of this project are to determine the process of waste management in St. Thomas, how effective and environmentally friendly it is, and how we can steadily improve the infrastructure by adding more sites. There are multiple methods to come to the results that we hope for, but by way of research and ArcGIS mapping software, it opens a door to a whole new avenue. The mapping software of ArcGIS allows a new way to hypothesize in this research project. Furthermore, this project could benefit St. Thomas in many ways, including improving our important environment, as it would prolong the beauty of our wonderful island.

This work was supported by NSF HBCU-UP ACE Implementation Project: The UVI Growth Model (1623126).

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Organization Team

Dr. Laida Rogers, *SURP Program Summer Coordinator, St. Thomas*
Dr. Verleen McSween, *SURP Program Summer Coordinator, St. Croix*
Ms. Aimee Sanchez, *Grants Manager*

Zoom Session Moderators

Karyl Askew, Laida Rogers, Neelam Buxani, Diana Bowen, Aaron Rapp, Timothy Kentopp, Genae Gonsalves, Verleen McSween

*We thank the mentors for dedicating their time and energy to assist these student to prepare their presentations. You have made a huge contribution to their success and the symposia. Your dedication to the advancement of young Caribbean scientists in his community is greatly appreciated.
Thank you!*



STUDENT BIOGRAPHIES



Akilah Hodge, Junior, Biology & Psychology

Abstract Page: 19

My name is Akilah Hodge, a 22-year-old double major from the St. Croix campus. My majors are both Bachelors of Science in Biology and Psychology. In the future I plan on being a Psychiatrist or studying individual with rare diseases and/or malformations.



Alexanne Carr, Junior, Psychology

Session 1, 1:30-1:40pm

Abstract Page: 17

I am a non-traditional undergraduate psychology major, at the University of the Virgin Islands, on the Albert A. Sheen campus. I am intrigued by how the mind operates and the effects of social stressors (i.e. discrimination, racism, peer pressure, etc.) that directly or indirectly contribute to that experience. Graduate school is in my future with a focus on research that will contribute to the neuropsychological field within a Caribbean population.



Amanda Boissiere, Junior, Marine Biology

Session 4, 1:10-1:20pm

Abstract Page: 11

Amanda G. Boissiere is a junior at the University of the Virgin Islands. Aspiring to be a marine biologist, she plans to go into coral restoration. She wants to travel the world restoring one reef at a time.

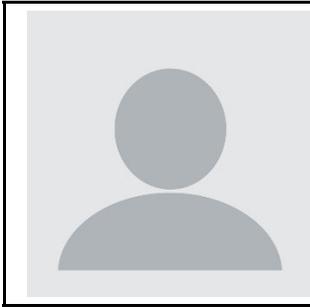


Angelisa Freeman, Senior, Biology

Session 1, 1:40-1:50pm

Abstract Page: 23

Angelisa Freeman is a rising senior, majoring in Biology with a minor in Environmental Science. She holds an Associate Degree in Environmental Science and Teacher Education-Secondary Level. Her interests lie in STEM Education, Ecology, and doing research in Education. Her future goals are to complete her Bachelor's degree in Biology and successfully obtain a PhD in Molecular Biology and Genetics.



Ashley Challenger, Junior, Psychology

Session 2, 1:50-2:00pm

Abstract Page: 18

Good day, my name is Ashley Challenger, a junior Psychology major at the University of the Virgin Islands, St. Croix campus. I am pursuing a Bachelor of Science degree in Psychology with a minor in English. This summer marks my second year with the Emerging Caribbean Scientists Scholar program. My prime focus within my field is Cognitive Behavior and Developmental Psychology.



Briana Cromwell, Junior, Biology

Session 1, 2:00-2:10pm

Abstract Page: 20

I am a rising scholar at the University of the Virgin Islands pursuing a Bachelor's of Science degree in Biology. I am the elected Vice-President of the UVI Pre-Health Society. With great determination I aspire to become an Obstetrician Gynecologist. It is my hope to change the world of medicine for sterile women.

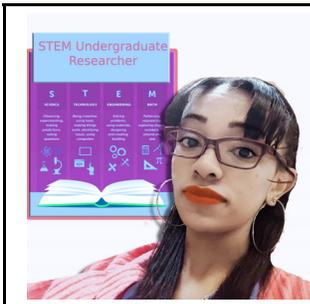


Chloe Camacho, Junior, Marine Biology

Session 4, 1:20-1:30pm

Abstract Page: 14

I am a junior majoring in Marine Biology on the OEK campus. In the future I would like to focus on coral restoration.



Donna Archer, Sophomore, Chemistry and Nursing with Minor in Psychology

Session 1, 1:20-1:30pm

Abstract Page: 9

Good day! My name is Donna Archer, and I'm currently an undergraduate research student whose interested in learning and conducting research in scientific fields such as: experimental psychology, psychosocial interventions that can be used to stimulate cognitive retention, improve memory, informal learning, and engagement in STEM, mechanical and genetic engineering, chemistry (biochemistry), botanical and traditional Chinese medicine, preventative care (using a holistic approach), and wellness. I love learning

and expressing my passion for science using arts and crafts, writing, and a visual approach. The methods I use are inspired by Leonardo DaVinci and Albert Einstein.

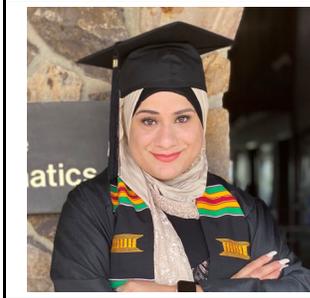


Esonica Charles, Junior, Biology

Session 2, 1:20-1:30pm

Abstract Page: 19

I have participated in the Emerging Caribbean Scientist Program for the past two years. I'm a junior working to attain my Bachelors of Science in Biology and a minor in Sociology. I aspire to become a physician and researcher.



Fatima Suid, Alum, Biology

Session 1, 1:10-1:20pm

Abstract Page: 21

Fatima Suid was born and raised in the US Virgin Islands. She recently graduated from The University of The Virgin Islands, receiving her Bachelors of Science in Biology, with a minor in Psychology. Her future plan is to become a physician and hopes to make a change in the world.

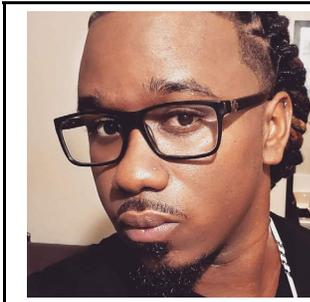


Jackeima Flemming, Junior, Marketing Minor-Data Science

Session 4, 1:50-2:00pm

Abstract Page: 22

I am a curious, creative that is looking forward to a future career as a strategic target market & segmentation analyst. Research excites me and I was honored to have been granted the opportunity to combine all my interests (research, creativity, conservation, product development, and gardening) into an awesome summer of experiential learning. I even more confident in the role Science plays in diversification and sustainability of our economy.



Jahnyah Brooks, Senior, Biology

Session 4, 2:00-2:10pm

Abstract Page: 12

My name is Jahnyah Brooks and I am a senior currently attending the University of the Virgin Islands. I am also a US Army veteran, where I served four years at Schofield Barracks Hawaii and left with many accolades including an honorable discharge paired with an Army Good Conduct Medal, to name a couple. After serving my term, I returned to the Virgin Islands where I used my military education benefits to begin my academic/research career. My research interests focus on wildlife biology and conservation and

I am an aspiring herpetologist that has taken part in four summer REU programs all of which were wildlife oriented.

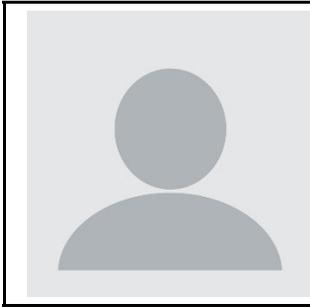


Jaiel Wyllis, Freshman, Applied Math & Engineering

Session 4, 2:10-2:20pm

Abstract Page: 35

My name is Jaiel Wyllis and I am a student at the University of the Virgin Islands. I major in Applied Mathematics with the hope of going into Biological Engineering. I live on the island of St. Thomas which is where I also attend the university.

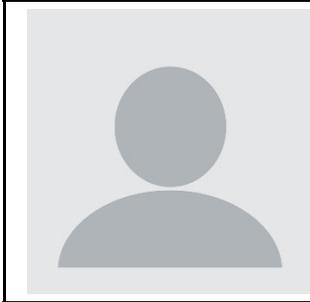


Javier Galiber, Junior, Applied Math & Engineering

Session 3, 1:10-1:20pm

Abstract Page: 24

Hello, I am Javier Galiber. I live a rather simple life with normal day to day activities. I mostly spend my time either tinkering with computers, playing video games, reading manga or watching anime.

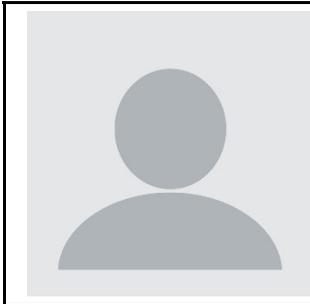


Joel Mwambungu, Senior, Physics

Session 3, 1:50-2:00pm

Abstract Page: 28

My name is Joel Mwambungu. I am a fourth year Physics and Computer major here at the university. I am mainly interested in projects related designings computer physics simulations, working with instrument data or anything in the realm of computer engineering that involves problem solving and creativity.

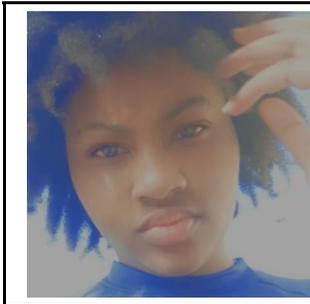


Jordina Pierre, Senior, Physics

Session 2, 1:10-1:20pm

Abstract Page: 30

Hi! My name is Jordina Pierre, and I am a rising senior at the University of the Virgin Islands majoring in Physics and Mathematics with a Minor in Computational Science. I have many interests ranging from brain & cognitive science to climate change and renewable energy sources. I aspire to pursue a Ph.D. in Electrical Engineering & Computer Science to gain new skills that can be readily applicable in the Virgin Islands.



Kahlifah Powell, Junior, Marine Biology

Session 4, 2:20-2:30pm

Abstract Page: 31

My name is Kahlifah Powell and I am a third year undergraduate student. I am 19 years old. My major is in Marine Biology and my minor is in Environmental Science. I enjoy learning about about organisms that live in the ocean.



Karla Williams, Sophomore, Nursing

Session 2, 1:30-1:40pm

Abstract Page: 34

My name is Karla C. Williams. I am a pre-nursing major on the Albert Sheen campus of the University of the Virgin Islands. I like reading and learning new things.



Keedencia Harris, Senior, Marine Biology

Abstract Page: 15

My name is Keedencia Harris and I am from the beautiful island of St Kitts. I am currently a Senior majoring Marine Biology. I love animals and the ocean and would one day like to become a veterinarian.



Khaysaun Vanterpool

Session 3, 1:20-1:30pm

Abstract Page: 33

I am 19 years old currently attending the University of the Virgin Islands. My hobbies are outside activities, reading, and being an entrepreneur. This is my first time participating in the ECS Summer Research program and it is so far a different and interesting experience for me.



Kiandre Rogers, Junior, Computer Science

Session 3, 1:30-1:40pm

Abstract Page: 32

My name is Kiandre Rogers, and I am a Junior at the University of the Virgin Islands pursuing a major in Computer Science. I am from the glorious island of St. Kitts, and I relocated to the Virgin Islands in the year 2014 to continue my high school education. I'm the oldest of 4 children and, I was born on March 30, 1999.



LeAnn Horsford, Senior, Biology

Session 2, 1:40-1:50pm

Abstract Page: 27

My name is LeAnn Lillia Horsford, and I was born on the beautiful island of St. Thomas, USVI. I am twenty years old, and I am currently a senior at the University of the Virgin Islands, where I am majoring in Biology. With my bachelor's degree from UVI, I plan to attend medical school which will allow me to fulfill my dream of becoming a pediatrician. My research interests are anything medical related which is why the project that I am working on this summer is very interesting to me.



Makayla Carino, Senior, Marine Biology

Session 4, 2:30-2:40pm

Abstract Page: 16

Hey there, my name is Makayla Carino. I live on the island of St. Croix. I am 21 years old and a senior attending the University of the Virgin Islands. I've been a part of the Emerging Caribbean Scientist (ECS) for about 4 years and an undergraduate SEAS member for 2 years. I enjoy learning new information about marine animals every day.



Michael Caracciolo, Alum, Biology

Session 4, 2:40-2:50pm

Abstract Page: 15

Born and raised on the island of St. Thomas, Michael Caracciolo graduated from the University of the Virgin Islands with a Bachelor of Science in Biology. He aspires to be an oncologist and one day return to his home to give back to the community. This summer, he worked with Saint Thomas East End Reserve (STEER) where he did benthic surveys for DPNR.



Ne'Kye George, Junior, Applied Math & Engineering

Session 4, 1:40-1:50pm

Abstract Page: 25

My name is Ne'kye George. I aspire to be an electrical engineer. I love anything science and technology related and hope to contribute to these fields. My dream job would be working for Apple but wherever my career takes me, I'll happily go.



Nikita Beck, Senior, Marine Biology

Session 1, 1:50-2:00pm

Abstract Page: 10

Nikita Beck is a 5th year student at the University of the Virgin Islands aspiring towards a Bachelor of Science in Marine Biology. She's been curating an interest in Informal Education and Curriculum Development over the past year and aspires to bring change to V.I. education.



Rickila Hanley, Junior, Applied Math & Engineering

Session 3, 1:40-1:50pm

Abstract Page: 26

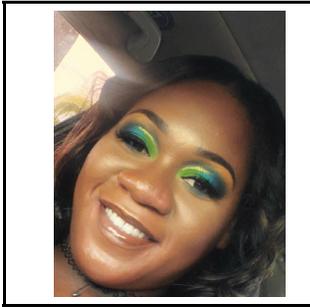
Rickila Hanley is a junior at the University of the Virgin Islands in pursuit of an undergraduate degree in Biomedical Engineering. Rickila was born and raised in the federation of St. Kitts and Nevis. Rickila is a firm believer that new experiences help to shape a person's skills and qualities. Her beliefs have inspired her to participate in the ECS program and increased her interest in Astronomy.



Samuel Gittens Jr., Senior, Marine Biology

Abstract Page: 14

I am a senior at the UVI Orville E. Kean Campus studying Marine Biology. I enjoy swimming, scuba diving, and viewing marine life in the ocean. My future career interests are marine conservationist, aquarist, and underwater filmmaker.



Sheneka Patrick, Senior, Applied Math & Engineering

Session 3, 2:00-2:10pm

Abstract Page: 29

I'm an undergraduate student attending the University of the Virgin Islands on St. Croix majoring in applied mathematics and engineering (dual engineering program). My interests are reading, relaxing, and researching. This year my research project prods on some bases of electronics and programming, definitely areas that interests me.



T'Leah Serieux, Senior, Biology

Abstract Page: 27

My name is T'Leah Serieux and I was born and raised in St. Thomas, USVI. I am currently a senior at UVI, majoring in biology. After graduation, I plan to attend medical school.



VerNele Callwood, Senior, Marine Biology

Session 4, 1:30-1:40pm

Abstract Page: 13

Ver Nele Callwood Rising senior at the University of the Virgin Islands, pursuing a Bachelors of Science degree in Marine Biology. My collegiate choice of study was inspired by my participation in many STEM related summer programs, including the Youth Ocean Explorers. Upon completing my undergraduate degree, I aspire to further my education in the study of Veterinary Medicine.

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