4th Annual
SUMMER RESEARCH
SYM
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2018
August 10

UNIVERSITY *of* **WEST FLORIDA** | **Hal Marcus** College of Science and Engineering

SURP
SUMMER UNDERGRADUATE RESEARCH PROGRAM

BIOLOGY

Environmental DNA of the Frecklebelly madtom
Kelsey Hope and Dr. Alexis Janosik

Investigating Bacteria Sensitivity to Phage Infection
Emma Bowland and Dr. Hui-Min Chung

Diving Deeper with Argie
Samuel Alvarado and Dr. Hui-Min Chung

*The Coquina Project: Investigating the Microbiome
and Genomics of Donax variablis*
Joseph Reidy, Joshua Mishoe, Angel Chu,
Freedom Green, Allison McMullen, Leila Harris,
and Dr. Hui-Min Chung

*Effects of Atypical Anti-Psychotic Drugs
on Neutrophils*
Anna Colley, Courtney Swain, and Dr. Peter Cavnar

Designing a Better Juvenile Sea Turtle Tag
Alexia Kenney, Sam Schemmer, Kasey Lugo,
Dr. Susan Piacenza and Dr. Joseph Piacenza

*PARIS (ZNF746) mediates α-synuclein
induced neurodegeneration : Relevance to
sporadic Parkinson's Disease (PD)*
Stephan Quintin, Rosa Shi, Saebom Lee,
Saurav Brahmachari, Changqing Yuan,
Senthilkumar S. Karuppagounder,
Sangjune Kim, Preston Ge, Esther Kim,
Alex Liu, Donghoon Kim, Haisong Jiang,
Manoj Kumar, Seung Pil Yun, Tae-In Kam,
Xiaobo Mao Yunjong Lee, Lino Tessarollo,
Han Seok Ko, Deborah A. Swing,
Valina L.Dawson, and Dr. Ted M. Dawson

Agitation in Alzheimer's Clinical Research
Josh Cook and Dr. Rodney Guttmann

*The role of the heat shock protein HSP90 in
retinal photoreceptor regeneration*
Verdion Martina and Dr. Scott Taylor

CEDB   CENTER FOR ENVIRONMENTAL DIAGNOSTICS & BIOREMEDIATION

*The effect of sunscreen active ingredients on
bacterioplankton production: The importance
of photochemistry*
Elyse Barker, Melissa Hederington-Hagy,
and Dr. Wade H. Jeffrey

Short term variability in water quality in Indian Bayou
Katherina Smyth and Dr. Jane Caffrey

Impacts of Red Clay on Indian Bayou sediments
Wendy Teutchler, Caitlin Turnbull, Dr. Jane Caffrey,
and Dr. Johan Liebens

*Seagrass Monitoring: a partnership between
citizens and UWF students*
Donald J. Fontentot, Victoria Henry, Barbara Albrecht, Rick
O'Conner, Christina Verlinde, and Dr. Jane Caffrey

*Seagrass impacts on porewater biogeochemistry:
a comparison of four species*
Mackenzie Rothfus, Katherina Smyth,
Dr. Jane Caffrey, and Dr. Florian Cesbron

*Mackenzie Rothfus (l) and Katherina Smyth (r) show how long the blades
of Vallisneria americana are in the Escambia River delta*

CHEMISTRY

*Chemical Design of the Tunable Molecular Magnet
Cu9X2(cpa)6 for NASA-based Microgravity
Crystal Growth*
Lauryn Reid, Jesse Taylor, Jack Lovett, Joe Lupton,
and Dr. Leonard ter Haar

CHEMISTRY CONT.

Highly Frustrated Magnetism in the Triangulated Kagome Lattice
William Farmer, Jack Lovett, Joe Lupton, Lauryn Reid, Sam Skinner, Jesse Taylor, and Dr. Leonard ter Haar

Heat Capacity of the Highly Frustrated Triangulated Kagome Lattice
Sam Skinner, William Farmer, and Dr. Leonard ter Haar

Lattice Stability and Thermodynamic Properties of Magnetic Metal Organic Frameworks for NASA-based Microgravity Crystal Growth
Jacob Moses, Ronald Coro, Brendon Ortolano, Savannah Richardson, and Dr. Leonard ter Haar

Surface-assisted Laser Ionization/Desorption Mass Spectrometry of Small Organic Molecules Using Non-functionalized Transition Metal Oxide Nanoparticles
Savanna S. Ward, Julia I. Schwieg, Michelle P. Lapak, Bryan Zanca, Lauren F. Barnes, Joseph R. Yount, and Dr. Karen S. Molek

Surface Assisted Laser Desorption Ionization Mass Spectrometry (SALDI-MS) Signal Enhancement as a Function of Nanoparticle Size/Surface Area
Savanna S. Ward, Joseph Yount, Michelle Lapak, Lauren F. Barnesa, Julia I. Schwieg, Bryan Zancab, Steven Varnum, Dr. Abayomi D. Olaitan, and Dr. Karen S. Molek

Simplified Chemical Synthesis of the Trifluoromethylator and Related Compounds
Michael D. Wells, Mia N. Thomson, Lauryn R. Reid, Megan E. Hinrichsen, Elisey A. Shcherbina, A. Sophia Arango, Michael D. Huang, and Dr. A. Timothy Royappa

Crystallization of Highly Insoluble Copper(I) and Gold(I) Thiolate Salts
Raquel Pinto Da Conceicao and Dr. A. Timothy Royappa

Crystal Structures of the Molecular and Ionic Forms of the Trifluoromethylator
Rachel A. Nyenhuis, Kassandra R. Oldham, Wendy C. Teuchtler, Jade Jacobs, Niccole L. Auld, Kaleigh R. Haga, Brett J. Bookheimer, and Dr. A. Timothy Royappa

Raquel Conceicao synthesizes copper(I) thiolates for her research.

Low Molecular Weight Polyester Polyol Copolymers: Synthesis, Characterization and Crystal Morphologies
Thomas Hunt, Josh Dvorak, Christina Pizza, and Dr. Alan K. Schrock

Synthesis of benzo[b]thiophenes via oxidative halocyclization
Sohail Mirza, Alex Tran, Matthew Blum, and Dr. Tanay Kesharwani

Green synthesis of biologically useful 1-methyl-3-halo-7-azaindole derivatives using table salt as the source of chlorine
Aimee Phillips, Kajal Naran, Christopher Cunningham, and Dr. Tanay Kesharwani

Synthesis of biologically useful isoquinoline, naphthalene and quinazolin-6-one using electrophilic cyclization
Christopher Cunningham, Amy Platt, and Dr. Tanay Kesharwani

Synthesis of a Metalloenzyme Mimic with Substrate Binding Site
Kevan English, Christina Pizza, and Dr. Ajay Lajmi

CHEMISTRY CONT.

Kinetics of a Hydrolytic Enzyme Mimic
Lacey Carroll, Taylor Best, Andrew Porter,
and Dr. Ajay Lajmi

Wavelength Dependence Toxicity Using Various Oils
Lauren Heidenrieich and Dr. Pamela Benz

*The Synthesis of Surface Modified Zinc Oxide
Quantum Dots Using Various Capping Agents*
Jessica Loguercio, Jessica Davis Gunn,
and Dr. Pamela Benz

*A Study of Different Solvent Systems in the Synthesis
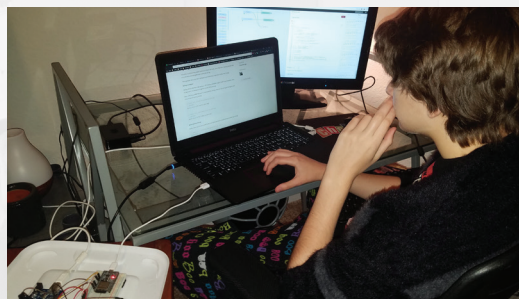of Surface Modified Zinc Oxide Quantum Dots*
Brecklyn Groce and Dr. Pamela Benz

*DDT Extraction and Analysis:
A Comparison of Methods*
Jeff Wright, Michael Hopko, Dr. Pamela Benz,
and Dr. Johan Liebens

Jeff Wright collects sediment cores on Escambia River.

COMPUTER SCIENCE

*Secure Data Acquisition and Transfer
for The Internet of Things*
Melissa Nichols and Dr. Amitabh Mishra
(pictured above)

*Automatic Architecture Modelling Tool
for Microservices Architecture*
Keenal Shah and Dr. Brian Eddy

*Generating and Rendering Flow Maps
with GPU Acceleration*
Hunter Werenskjold and Dr. Brian Eddy

*Instrumenting the UWF Cyber Range
Training Environment*
Michael Mitchell, Justin Fruitticher, Anthony Pinto,
and Dr. Thomas Reichherzer

*An Intelligent Learning Tool to Improve
Situational Awareness*
Nathaniel Reyes, Wenwen Zu,
Dr. Thomas Reichherzer, and Dr. Brian Eddy

*Applications of Machine Learning to Classify
Activities in a Smart Home Using Sound*
Andrew Petrovsky and Dr. Thomas Reichherzer

EARTH AND
ENVIRONMENTAL SCIENCES

*Big Data and Interdisciplinary Geosciences
Research: Examining the Rainfall Influences
of the North Atlantic Subtropical High*
Jared White, Allen Ward, Allynn Burns, Dr. Dallas
Snider, Dr. Anthony Okafor and Dr. Jason Ortegren

EARTH AND ENVIRONMENTAL SCIENCES

Influence of the North Atlantic Subtropical High on Eastern U.S. Rainfall Variability
Jared White and Dr. Jason Ortegren

DDT in Estuarine Sediments 1:
Depth Trends and Pollution Levels
Michael Hopko, Jeff Wright, Dr. Pamela Benz, and Dr. Johan Liebens

Tidal Influence on Groundwater Contaminant Flow
Andrew McManaway, Shawnee Doling-Tye, and Dr. Phillip Schmutz

Utilizing Arduino and Particle Microcontrollers for Geomorophological Research
Simone Schuster and Dr. Philip Schmutz

Impact of shoreline development on Escambia bay water temperature
Michael Garrett and Dr. Zhiyong Hu

Statistical Correlation between the GDP of Floridian Metropolitan areas and satellite remote sensing nighttime light data
Adam Kohl and Dr. Zhiyong Hu

Using Satellite Remote Sensing Techniques to Monitor Algae Blooms in the Gulf Of Mexico
Guy Chapman and Dr. Zhiyong Hu

Submarine Ground Water Effects on Stable Isotope Ratios in Thalassia testudinum
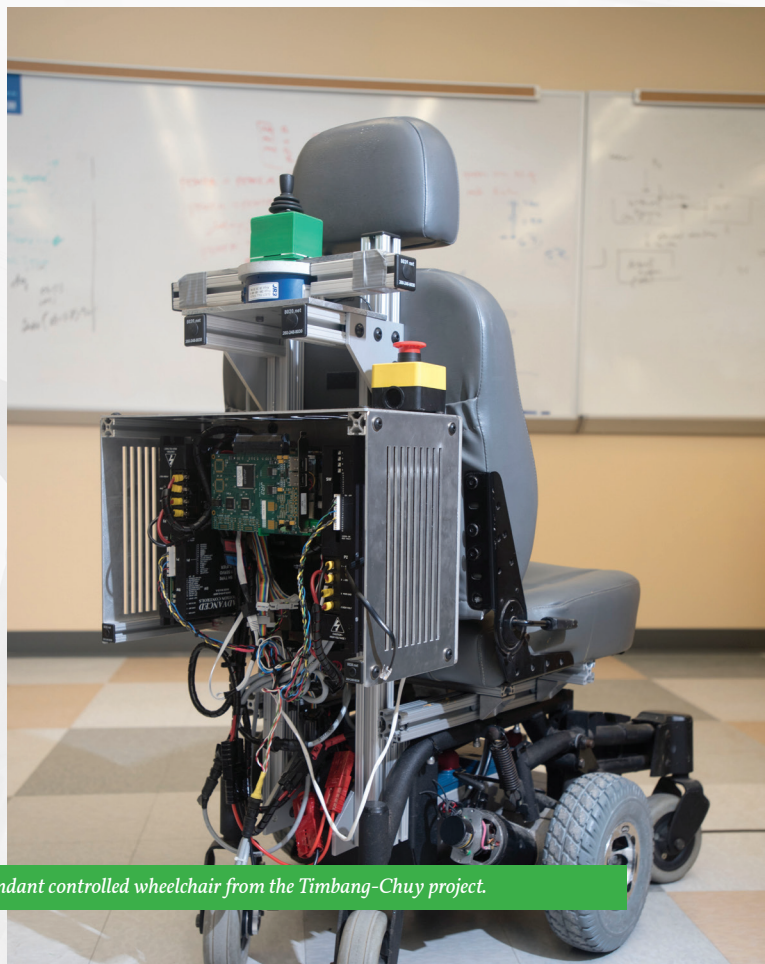Haley McQueen and Dr. Matthew Schwartz

Haley McQueen directs her team for her research in the Gulf of Mexico.

ELECTRICAL AND COMPUTER ENGINEERING

Development of a Low Cost Haptic Interface for Attendant Controlled Wheelchair
Joseph Timbang and Dr. Oscar Chuy

Attendant controlled wheelchair from the Timbang-Chuy project.

Modelling of Human - Mobile Co-Robot Physical Interaction
Andrew Hanks and Dr. Oscar Chuy

Decentralized Power and Energy Management using a Deterministic Approach
Stephen Harris and Dr. Bhuvaneswari Ramachandran

Impacts of Coordinated Cyberattacks on an Electric Power Grid
Alex Brock and Dr. Bhuvaneswari Ramachandran

INFORMATION TECHNOLOGY

Leveraging Database Technologies to Analyze the Correlation Between Atmospheric Pressures in the North Atlantic Ocean and Rainfall Totals in the Eastern United States
Allen Ward, Dr. Dallas Snider, and Dr. Jason Ortegren
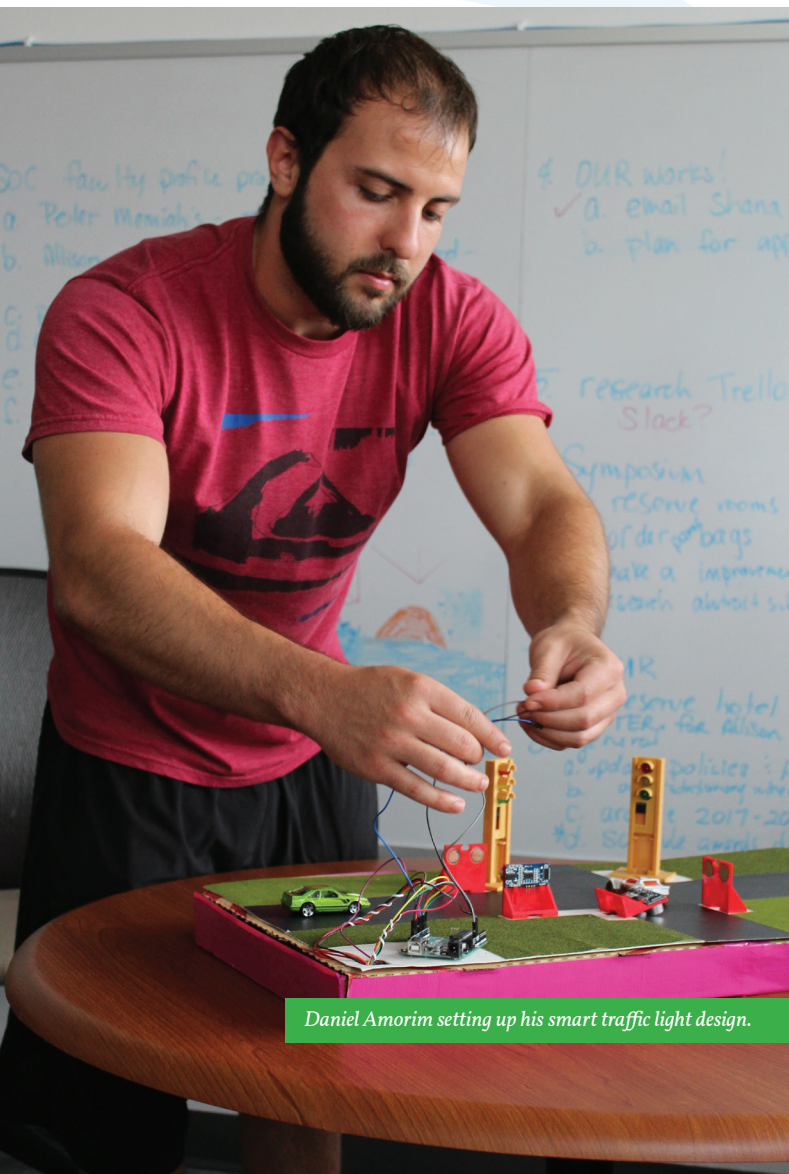
Smart Farms Technology
Rebecca Williams, Dr. Chandra Prayaga,
and Dr. Lakshmi Prayaga

Techniques for Robot Localization
Joshua Lyle, Dr. Chandra Prayaga,
and Dr. Lakshmi Prayaga

Smart Traffic Lights to Facilitate Efficient Traffic Control
Daniel Tancredi Amorim, Dr. Aaron Wade,
Dr. Chandra Prayaga, and Dr. Lakshmi Prayaga

Daniel Amorim setting up his smart traffic light design.

MATHEMATICS

Finding Community structure in networks using the Modified Spectral Clustering Algorithm
Ti Chen *(pictured above)* and Dr. Jia Liu

Modeling Average Summer Rainfall From Environmental and Geographical Factors Under the Influence of the North Atlantic Subtropical High (NASH)
Allynn Burns and Dr. Anthony Okafor

PHYSICS

Spectral Analysis of Low-Energy 22- and 23-atom Boron Clusters
Ryan Lashley, Kevin Francis, Mikaela Pabon,
and Dr. Christopher Varney

Surface-Enhanced Raman Spectroscopy of DCVJ on Nanostructured Surfaces
Trevor Olsson and Dr. Laszlo Ujj

MECHANICAL ENGINEERING

Using Biomimetic Features to Optimize Wind Turbine Blade Design
Diana Hanks and Dr. Cheng Zhang

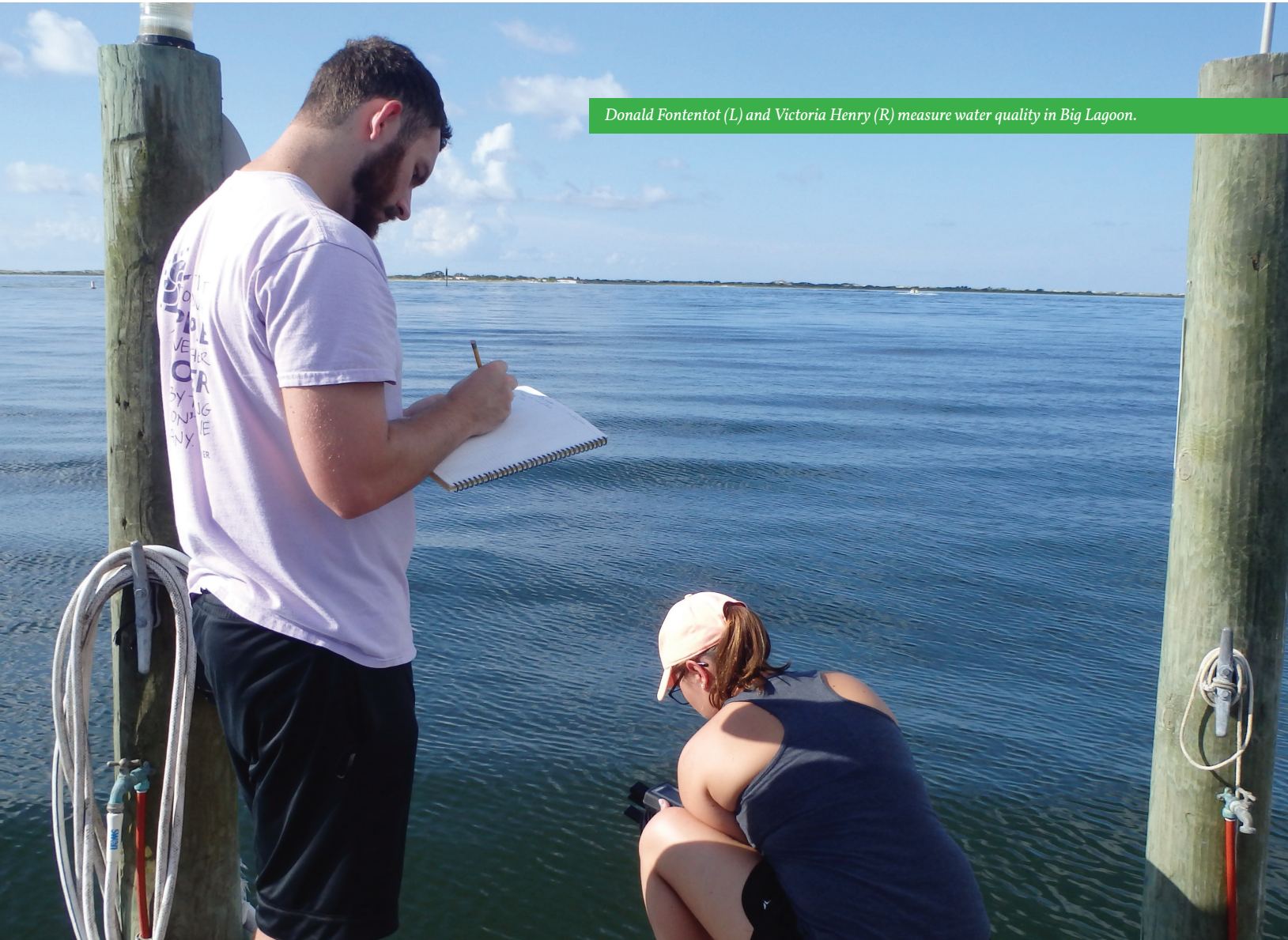*Leading-Edge Tubercles and Trailing-Edge Serrations for Tidal Current Turbines*
Eric Muller and Dr. Cheng Zhang

Exploration of Pre-Packaging Food Cartridge Design Strategies for Commercial 3D Food Printing Applications
Renan Barbosa and Dr. Joseph Piacenza

Renan Barbosa (L) and Jorge Guedez , a SURP explorer (R), determining nozzle size for their 3D food printer, capable of printing a variety of homogeneous (e.g., cookie dough) and heterogeneous (e.g., chocolate chips) foods

Donald Fontentot (L) and Victoria Henry (R) measure water quality in Big Lagoon.

The Hal Marcus College of Science and Engineering (HMCSE) celebrates student-centered research by our faculty and research staff. The 2018 Summer Undergraduate Research Program (SURP) is the fourth year in which we have invested in an intensive undergraduate research experience requiring selected students to devote 250 or more hours to a research project under close supervision of a faculty mentor.

Additionally, HMCSE faculty mentor undergraduate and graduate students over the summer and throughout the year in other programs, from course-based research to graduate thesis projects. Thank you for joining us for today's celebration of all HMCSE summer research efforts by our faculty, staff, and students.

AGENDA

10:00   Poster Session
Poster presentations are listed by department & floor

12:00   Lunch, 1st Floor

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