



Fall 2016

## Honors Research Symposium Program Fall 2016

University Honors Program Students and Staff

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### Recommended Citation

and Staff, University Honors Program Students, "Honors Research Symposium Program Fall 2016" (2016). *University Honors Research Symposium Programs*. 15.  
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FALL 2016

# HONORS RESEARCH SYMPOSIUM

UNIVERSITY  
HONORS  
PROGRAM



**GEORGIA SOUTHERN UNIVERSITY**  
**NOVEMBER 30, 2016**

Fall 2016 Honors Research Symposium

## **PROGRAM SCHEDULE**

**NESSMITH-LANE CONFERENCE CENTER**

### **RECEPTION**

5:45 pm to 6:15 pm

Room 2911

Welcome

Dr. Francis Desiderio

### **THESIS/CAPSTONE PRESENTATIONS**

6:15 pm to 7:50 pm

Rooms 2903, 2904, and 2905

Session 1 6:15 pm to 7:00 pm

Session 2 7:05 pm to 7:50 pm

### **PRESENTATION OF MEDALLIONS**

7:55 pm to 8:15 pm

Room 2911

# THESIS PRESENTATIONS

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**SESSION 1: 6:15 PM TO 7:00 PM**  
**ROOM 2903**

**Janki Patel**

**Accounting**

**The Abuse of Foreign Income Tax Credit**  
**Dr. Britton McKay**

This analytical study examines the abuse of foreign income tax credit with data from 1996 – 2011. There are various ways to categorize the foreign tax credit, yet this study examines the foreign tax credit taken in various geographic regions. Additionally, it also analyzes the individual foreign tax credit claimed and corporate tax credit claimed to conclude on which unit abuses the credit utmost.

**Mia Martin**

**Logistics and Intermodal Transportation,  
Marketing**

**The Chinese Seaport System: Strengths and Weaknesses**  
**Dr. Trey Denton**

With an economy dominated by foreign trade, seaport infrastructure is a critical consideration when setting up logistical systems when importing from and exporting to the People's Republic of China. This study examines the state of the Chinese seaport system from the perspective of U.S. shippers and shipping companies.

# THESIS PRESENTATIONS

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**SESSION 1: 6:15 PM TO 7:00 PM**  
**ROOM 2904**

**Riley Theis**

**Chemistry**

**Quantum Chemical Rovibrational Spectra for Noble Gas Molecular Cations**

**Dr. Ryan Fortenberry**

The discovery of ArH<sup>+</sup> in the ISM, indicates that noble gas chemistry may be of more importance than previously believed. The present work uses quantum chemical techniques to describe undetected noble gas compounds including NeH<sub>2</sub><sup>+</sup>, ArH<sub>2</sub><sup>+</sup>, ArH<sub>3</sub><sup>+</sup>, NeOH<sup>+</sup>, and ArOH<sup>+</sup>, which can be used to assist in identifying undetected molecules.

**Benoit Kindo**

**Chemistry**

**Carinata FAME Production Process and Biofuel Oxidation**

**Dr. Brian Koehler and Dr. Valentin Soloiu**

The contribution of a standard production method for biofuels on their oxidative stability was investigated using Carinata and Peanut FAMES. The washing and drying step was identified as the major oxidative contributor. The fuel's FAMES composition determined the need of this step in the refining process.

# THESIS PRESENTATIONS

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**SESSION 1: 6:15 PM TO 7:00 PM**  
**ROOM 2905**

**Molly McLaughlin** **Exercise Science**

**Reliability of Pennation Angle Measurements of the Gastrocnemius Muscle at 15 Degrees of Plantar and Dorsal Flexion**

**Dr. Dan Czech and Dr. Li Li**

The purpose of this research study was to measure plantar and dorsal flexion pennation angles of the gastrocnemius muscle using ultrasound while the participant is in an upright position. ImageJ was used to measure pennation angles. As hypothesized, pennation angle measurements were reliable while standing in an upright position.

**Diana Tyler** **Exercise Science**

**Reliability of Gastrocnemius Pennation Angle Using Ultrasound with 15 Degree Adduction and Abduction in Standing Position**

**Dr. Dan Czech and Dr. Li Li**

The purpose of this study was to measure pennation angle with ultrasound of the gastrocnemius muscle, while in a mechanically loaded position. Participants, on two separate days, had their ultrasound imaging taken in three different foot orientations: neutral, fifteen degree adduction., and fifteen degree abduction positions.

# THESIS PRESENTATIONS

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**SESSION 2: 7:05 PM TO 7:50 PM**  
**ROOM 2903**

**Charley Joyner** **Mathematics**

**Black-Scholes Equation and Heat Equation**  
**Dr. Enka Lakuriqi**

First, we present and define the Black-Scholes equation which is used to model assets on the stock market. After that, we derive the heat equation that describes how the temperature increases through a homogeneous material. Finally, we detail how the two equations are related.

**Joshua Gaspard** **Physics**

**Searching for Interstellar Silicate Dust Grains Using Quasar Absorption Systems in Distant Galaxies**  
**Dr. Monique Aller**

Quasar absorption systems can be used to study the composition of dust grains in the interstellar medium in galaxies. This research project explores several methods for analyzing infrared spectra, obtained with the Spitzer Space Telescope IRS, to study the silicate dust grain properties in distant galaxies.

# THESIS PRESENTATIONS

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**SESSION 2: 7:05 PM TO 7:50 PM**  
**ROOM 2904**

**Jonathan Taylor**

**Chemistry**

**Controlled Drug Delivery Utilizing Thermo-Responsive Functionalized Nanoporous Membrane**

**Dr. Ji Wu**

Drug delivery is an exciting research field that has gained much interest in recent years due to its high importance in medical and pharmaceutical science. Herein, smart thermo-responsive covalently functionalized nanoporous membranes are used to control the delivery rate of ibuprofen by way of external stimuli such as heat.

**Allee Murray**

**Chemistry**

**The Study of NF- $\kappa$ B Peptide Mimics and How Proteins Bind DNA**

**Dr. Amanda Stewart**

The protein complex nuclear factor kappa B (NF- $\kappa$ B) is widely considered to be one of the most influential transcription factors when studying cellular functions. Peptide mimics of NF- $\kappa$ B aim to inhibit DNA binding in order to displace the natural transcription factor, therefore inhibiting transcription and translation.

# THESIS PRESENTATIONS

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**SESSION 2: 7:05 PM TO 7:50 PM**  
**ROOM 2905**

**Salena Neuwar**

**Child and Family Development**

**A Study Exploring Parents' and Occupational Therapists' Views on Facilitating Social and Emotional Development**

**Dr. Katy Gregg**

This study served to identify how parents and occupational therapists each work with children on their development of social and emotional skills. The data exposed important skills that the parents and occupational therapists want for the child. It also led to an understanding that the location and external factors were vital to the relationship.

**Morgan Herrington**

**Recreation**

**Practicing Recreational Therapy in a World of Differences**

**Dr. Brent Wolfe**

Recreational therapy (RT) services are primarily based on Western-ideological perspectives that may hinder the implementation of RT internationally. This study explores different worldviews and evaluates the conceptual foundations of RT with respect to these differences. Findings attempt to identify ways to adapt and shape RT foundations for international applications.

## ABOUT HONORS

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The University Honors Program provides a small college atmosphere in the context of a large comprehensive university. The program is designed to foster the development of a critical sense of inquiry, a spirit of creativity, a global perspective and an ethic of civic responsibility. A hallmark of the program is the emphasis on bringing ideas to life through undergraduate research, experiential learning and service-learning opportunities.

*The University Honors Program rests on a foundation of the following ideals that are inspired by the institution's emphasis on engaged learning.*

### CRITICAL SENSE OF INQUIRY

Honors students will explore a variety of approaches to research designed to foster the pursuit of knowledge. Students will develop the ability to question with a healthy skepticism toward accepted opinion. The culmination of the undergraduate experience is an independent research or creative project designed to exemplify a critical approach to inquiry.

### SPIRIT OF CREATIVITY

Honors students will embrace the idea that creativity is a virtue that should be experienced by all students, regardless of discipline. This spirit involves a respect for different ways of knowing and an openness to intellectual discussion and challenge.

### CIVIC RESPONSIBILITY

Honors students will demonstrate an ethic of civic responsibility and exemplify the motto of the program, "Humility before Honor." Students will be challenged to use their abilities and talents for the advancement of humanity and the pursuit of a greater good. The primary vehicle for the expression of civic responsibility is through service both to the university and the community.

### GLOBAL PERSPECTIVE

Honors students will develop a perspective which allows them to approach their chosen discipline from an international point of view. This outlook involves the critical exploration of global concerns and generation of proposed solutions to international problems. Honors education provides this worldwide perspective through academic courses, study abroad opportunities and co-curricular experiences.

## CONGRATULATIONS TO OUR FALL 2016 GRADUATES

Trevor Camper  
Meredith Eby  
Joshua Gaspard  
Charles Joyner  
Benoit Kindo  
Mia Martin  
Molly McLaughlin  
Allee Murray  
Janki Patel  
Joshua Reeves  
Jonathan Taylor  
Riley Theis  
Diana Tyler



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Designed by Elise Rustine ('18)