

Announcing the Final Examination of Christina D. Moraitis for the degree of Doctor of Philosophy in Physics

Date: June 30th, 2025

Time: 10:00 a.m.

Room: PSB 160/161

Dissertation title: Advancing Ground-Based Instrumentation with Astrophotonics for Stellar Astrophysics and Time-Domain Spectroscopy

Abstract:

This dissertation presents advancements in Astrophotonics with a focus on PolyOculus technology - a novel, scalable approach to astronomical instrumentation designed to enhance observational capabilities in a cost-effective manner. It details the development of the Original PolyOculus Array (OPA), its integrated light-combining device (the photonic lantern), and its dedicated spectrograph, OPASpec. In parallel, the final commissioning of the MIRADAS Near-Infrared spectrograph is described. These instrumental innovations are applied to key astrophysical investigations, including the search for coronal mass ejections on M-dwarfs and time-resolved spectroscopic monitoring of T Coronae Borealis during its pre-eruption phase. By combining cutting-edge instrument design with cross-institutional collaboration, this work contributes to the evolving landscape of ground-based Astrophotonics in support of stellar astrophysics.

Outline of Studies:

Major: Physics, Planetary Sciences Track

Educational Career:

M. S. University of Florida, 2021

B. A. Samford University, 2018

Committee in Charge:

Dr. Stephen Eikenberry (Chair)

Dr. Rodrigo Amezcua-Correa

Dr. Joseph Harrington

Dr. Theodora Karalidi

Dr. Anthony Gonzalez (External Committee Member)

Approved for distribution by Dr. Stephen Eikenberry, Committee Chair,
on June 10, 2025.

The public is welcome to attend.