

## **Announcing the Final Examination of Seth Calhoun for the degree of Doctor of Philosophy in Physics**

**Date:** July 2, 2019

**Time:** 1:00 p.m.

**Room:** PSB 160/61

**Dissertation title:** Room Temperature VO<sub>x</sub> Air-Bridge Bolometer Integrated with Metal-Insulator-Metal Resonant Absorbers

### **Abstract:**

Spectrally-selective un-cooled micro-bolometers have many military and industrial applications for infrared sensing and imaging, e.g. target acquisition and chemical analysis. In this work, a micro-bolometer was fabricated with integrated wavelength-selective absorber based on subwavelength metal-insulator-metal (MIM) resonators.

The fabricated air-bridge structure used a vanadium oxide thin film as the bolometric element. A novel aqueous deposition method of depositing vanadium oxide was investigated and compared to traditional sputtered vanadium oxide to determine achievable temperature coefficient of resistance.

The MIM absorber itself was investigated as a function of the dielectric used, and the strong dependence of the resonance spectrum on dispersion was revealed. Finally, the completed bolometers were characterized, and usual figures of merit for thermal infrared detectors were determined

### **Outline of Studies:**

Major: Physics

### **Educational Career:**

M. S. University of Central Florida, Orlando, 2017

B. S. University of Central Florida, Orlando, 2015

### **Committee in Charge:**

Dr. Robert Peale (Chair)

Dr. Masahiro Ishigami

Dr. Christopher Bennett

Dr. Sasan Fathpour (External Committee Member)

Approved for distribution by Dr. Robert Peale, Committee Chair, on June 25, 2019.

The public is welcome to attend.