

**IEEE Miami Section Invited Seminar Announcement**

***“Synchrotron and Optical Probing of Mixed Halide Perovskites  
for Photovoltaics and Radiation Detectors”***

**Speaker:** Dr. Deidra R. Hodges

**Date:** Dec 2, 2021

**Lecture:** 1:00 pm, EC 3327, Mechanical Engineering Department Conference room , Florida International University (FIU), EC Campus, 10555 W Flagler St Miami, Florida 33174

**Zoom Meeting:**

<https://fiu.zoom.us/j/93328310744?pwd=QzB6TW1rcU1GUU1SOW5WRzBLOFILUT09>



**Abstract:**

The methylammonium lead iodide  $\text{CH}_3\text{NH}_3\text{PbI}_3$  (MAPbI<sub>3</sub>) perovskites have attracted a lot of attention as a possible absorber material for thin film solar cells due to their bandgap energy, high optical absorption coefficients and low-cost solution-processing deposition approaches. MAPbI<sub>3</sub> perovskite solar cells have evolved with transformative potential with laboratory efficiencies greater than 20%. Perovskite absorber materials are very inexpensive to synthesize and simple to manufacture, making them an extremely commercially viable option. Perovskites of compositional variations  $\text{ABX}_3$  can yield a range of crystal structures, phases, and stabilities. Here, we probe perovskites of compositional variations  $\text{ABX}_3$ . We report on the structural and optical properties of these perovskites. Photovoltaic (PV) devices were fabricated using these high tolerance factor perovskites. We report we have achieved power conversion efficiencies (PCEs) greater than 21% using the high tolerance factor perovskites investigated. The high tolerance perovskites were also characterized using synchrotron X-ray absorption near edge structure (XANES) spectroscopy at the National Synchrotron Light Source (NSLS) II at Brookhaven National Laboratory (BNL).

**Speaker's Bio**

Dr. Deidra R. Hodges is an Associate Professor in the Department of Electrical and Computer Engineering at Florida International University. Dr. Hodges is an exceptional leader in photovoltaics (PV) and solar energy research with extensive experience in PV and X- and gamma-ray radiation detectors for National Security. Dr. Hodges is highly focused in advancing Renewable Energy, Sustainability, Nuclear Materials and Extreme Photon Sensing. Her contributions include the support and development of the pixilated cadmium zinc telluride (CZT) gamma detector at BNL, and highly efficient thin-film mixed perovskite halides photovoltaics. She has achieved perovskite solar cell power conversion efficiencies greater than 21%, approaching the world record efficiency of 25.2%. Her network spans Department of Energy government laboratories including Brookhaven National Laboratory, Kansas City National Security Center Honeywell FM&T, and the National Renewable Energy Laboratory, collaborating with Scientists and as a user of facilities.

**For more information, please contact:**

Professor Osama Mohammed, Vice Chair of IEEE Miami Section, [mohammed@fiu.edu](mailto:mohammed@fiu.edu)

Professor Arif Sarwat, Chair of IEEE Miami Section VTS and Communications, [asarwat@fiu.edu](mailto:asarwat@fiu.edu)

Ketulkumar Polara, Webmaster of IEEE Miami Section, [kpola009@fiu.edu](mailto:kpola009@fiu.edu)