



ETI Annual Workshop, February 8 – 9, 2023



## **Organic-Inorganic Hybrid Perovskite Photodetectors for Room Temperature Low Light Detection**

Presenter: Allen Wood III

Advisor: Jinsong Huang

The University of North Carolina at Chapel Hill

wooda98@live.unc.edu

### **Abstract:**

Technologies such as photomultiplier tubes, or PMTs, and silicon photomultiplier arrays, or SiPM arrays, are the two most prevalent technologies for operating under low light conditions. These devices are able to operate as photon counting photodetectors or PCPDs under conditions that lower the dark count rate to a level where the gain of the devices can allow even single photons to be electronically detected with additional amplification in the read out electronics. Organic-inorganic hybrid perovskite photodetectors, or OIHP PDs have shown promise as traditional photodetectors able to operate under low input power, with small noise equivalent power, and a high linear dynamic range while operating under laboratory ambient temperature conditions. This contrasts the high noise of SiPM arrays and the high power demands of PMTs. Development of OIHP photon counting photodetectors, or OIHP PCPDs, is at a crucial stage in research where the detectors can not only rival the performance of current photodetectors at moderate light intensities, but may soon become a rival for modern PCPD technologies.