

FY22/23 DAGSI Research Topic

1. **Research Title:** Infrared Event Based Sensing
2. **Individual Sponsor:**

Dr. Charles Reyner AFRL/RYDH
2241 Avionics Circle WPAFB, OH 45433
charles.reyner.1@us.af.mil

3. **Academic Area/Field and Education Level**

Electrical Engineering (MS or PhD level)
Electro-Optics (MS or PhD level)
Material Science (MS or PhD level)
Physics (MS or PhD level)

4. **Objectives:** The objective of this research is to improve the sensitivity and bandwidth of infrared event-based sensors (EBS) through modeling, fabrication, and/or testing.
5. **Description:**
Event based sensors (EBSs) are high speed cameras with the ability to decrease data rates by orders of magnitude compared to traditional framing imagers. While currently used for machine vision and scientific research, there are multiple application spaces where EBSs might have a future role. Unfortunately, current EBSs are limited to the visible spectrum, with infrared versions expected shortly. The scope of this research is to improve the understanding of noise, bandwidth, sensitivity, and phenomenology in infrared EBSs. This goal can be accomplished through modeling, fabrication, and/or testing. Submissions that rely on commercially-available, visible EBS systems are acceptable if they build into infrared EBS capabilities. AFRL has in-house capabilities to support this work, including device modeling software, cleanroom fabrication facilities, and extensive optoelectronic testing equipment. Additional hypertemporal characterization capabilities are also expected.
6. **Research Classification/Restrictions:** Unclassified/U.S. Citizenship required
7. **Eligible Research Institutions:** Universities (DAGSI)

PA Approval #: AFRL-2022-3886PA