

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

DoD Investments in Microelectronics, RF Electronics, and Photonics



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LECTURE ABSTRACT

The U.S. Department of Defense (DoD) faces many challenges for secure, low-cost access to legacy, state of practice, and leading-edge systems. The aggregation of microelectronics demand across critical sectors provides an opportunity for DoD and partners. In response, the Trusted & Assurance Microelectronics Program has developed roadmaps for secure access to critical technologies including the following: State-of-the-Art (SOTA) Microelectronics, Advanced Packaging and Testing, Joint Federated Assurance Center (JFAC), and Educational and Workforce Development. These roadmaps guide DoD investments in microelectronics and inform interagency planning for future investments, such as the **CHIPS** Act. Manufacturing advancement of millimeter wave Radio Frequency Gallium Nitride devices and co-packaged optics for high-bandwidth data transfer will be shared as case examples from the Radio Frequency and Optoelectronics roadmap.

SPEAKER BIOSKETCH

Dr. Joshua Hawke leads the Radio Frequency and Optoelectronics Technical Execution Area on behalf of OUSD(R&E)'s Trusted & Assured Microelectronics program. His primary program management goals are: (1) maturation of mmW RF GaN foundries, (2) insertion of N-Polar GaN material into production-volume foundries, (3) maturation of co-packaged optics, and (4) demonstration of high-performance transceivers and high power computing. Additionally, he serves as the Chief Engineer of RF & Optoelectronics for the Radar Technologies Division at the Naval Surface Warfare Center (NSWC) Crane. The primary focus of his research targets the co-design of RF and power electronics for advanced sensor and communication systems. As a grateful recipient of the DOD SMART Scholarship, he received his Ph.D. in Electrical Engineering from Texas A&M University in 2014.

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