Reliance 21 – DoD Communities of Interest

Advanced Electronics

Scope/Thrust Areas

The Advanced Electronics Col provides Science and Technology (S&T) coordination in Electronic and Electro-Optic technologies that ensure DoD has affordable access to leading edge high performance electronics to avoid technology surprise while creating it for our purposes. S&T activities include: component and techniques development for Electromagnetic Spectrum Warfare from DC to light; advanced signal processing; design methods; sensors; trusted and affordable electronics; and underlying technologies.

Engagement Opportunities for Industry

- Defense Innovation Marketplace
- NDIA Annual Science & Engineering Tech Conference
- Government Microcircuit Applications & Critical Technology Conference (GOMACTech)

For More Information:
AE Col SG Chair: Dr. Philip Perconti (Dr. Romeo del Rosario, romeo.d.delrosario.civ@mail.mil)
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Power Electronics

10 KV SiC MOSFET

Electro-Optic/Infrared Components

Bi/Entangled Photon Sources at Telecom Wavelengths

EO and IR Sensors and Sources

Quantum-Based Components and Technology

Trusted Electronics
Beyond CMOS Technologies
- Integrated Photonic Circuits
- Neuromorphic Electronics
- Quantum Information & Sensing Technologies

Technologies for RF, mm-Wave, and Power Electronics
- Next Gen Wide Bandgap Semiconductors
- Frequency Agile Devices and Circuits
- Vacuum Electronics

Heterogeneous Integration and 3D Integration

Focus Going Forward

RF Components

Cross-Cutting Technologies

Quantum-Based Components and Technology

- Developed Sinara universal controller for quantum experiments that 30+ lab setups in US and Europe plan to use in 2018
- First DOD lab to trap ions, enabling future quantum networking and information processing protocol demonstrations

Digital, Analog, and Mixed Signal Cross-Cutting Technologies

- Established foundry capability for heterogeneous integration, accessible to entire mil/aero industrial base
- Demonstrated cloud-based Tri-Service design collaboration towards 3X cost reduction for leading edge chip design tools
- 2018 Report on Leveraging 5G Technologies for DoD

RF Components

- Demonstrated >1000 W helix TWT technology operating from 18-45 GHz to achieve effective radiated power >4 KW
- Designed and fabricated triple band MM-wave chips for EW

Electro-Optic / Infrared Components

- Patented and licensed to industry: fiber-based power and wavelength combination technology at long-wave infrared (LWIR)
- Transitions to programs in OSD/CWP, Army IRCM, Center for Countermeasures, SBIR CRADA for industry commercialization

Power Electronics

- Transitioned non-destructive SiC characterization tool and cross-polarizer technology

Electronic Materials

- Experimentally verified single-photon emission from defect-bound excitons in 2D transition-metal dichalcogenide monolayers (application: ultra-compact secure communications)