Department of Electrical and Computer Engineering

TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr.
College *of* Engineering

Spring 2024 Seminar Series

Seminar Title: ***New Directions in Magnetic Particle Imaging***

Time: 2:00-2:50 PM, Friday, Mar 22, 2024

Location: Holden Hall 150

Speaker:
Solomon Woods
National Institute of Standards and Technology (NIST)

Abstract:
Magnetic particle imaging (MPI) is an emerging technology for remote sensing, and recent research has been pushing the boundaries of this method. By exploring new tracer materials, improving the sensitivity and bandwidth of related instrumentation, and expanding the range of applications, MPI will reach its full potential. During the last five years, our team at NIST has developed novel magnetic nano-objects (MNOs) with enhanced magnetic response and thermo-sensitivity, temperature-tunable characterization and imaging instruments for precise 3D thermal magnetic particle imaging (T-MPI), and nanocomposites with embedded MNOs for high performance sensing in solid as well as liquid systems. MPI application development so far has been largely focused on biomedical imaging, but I will discuss other exciting potential application areas such as imaging heat flow and temperature in packaged semiconductors and fabrication of thermally smart materials enabled with nano-thermometers that can be read out using magnetic fields.

Speaker Bio:
Dr. Solomon Woods is a physicist in the Remote Sensing Group of the Sensor Science Division at the National Institute of Standards and Technology (NIST). He studied high temperature superconductivity during doctoral research at the University of California, San Diego (UCSD), followed by postdoctoral research on nanoparticle and thin film magnetism at IBM's T.J. Watson Research Center in New York. At NIST he has employed novel magnetic and superconducting materials to expand capabilities for magnetic and infrared remote sensing. Since 2019, he has co-led a team at NIST developing magnetic nano-objects, thin films, and associated instruments for sensitive, temperature-dependent magnetic particle spectroscopy and imaging.