Department of Electrical and Computer Engineering

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

Fall 2023 Seminar Series

Seminar Title: ***Advanced Magnetic Particle Imaging Complements Nuclear Medicine with Zero Radiation, Zero Prep, Zero Cytotoxicity, and Zero Half-life Limitations***

Time: 2:00-2:50 PM, Friday, Nov 17, 2023
Location: Biology 101

Speaker:
Steven Conolly
University of California, Berkeley

Abstract:
Magnetic Particle Imaging (MPI) is a cutting-edge noninvasive biomedical imaging technique with significant potential in vascular and cellular imaging. Distinguished by its use of physics distinct from conventional imaging modalities, MPI capitalizes on the magnetic transparency of human tissues, producing an "ideal positive" tracer contrast. Utilizing superparamagnetic iron oxide tracers, MPI achieves remarkable sensitivity, detecting micromolar concentrations rapidly and offering a radiation-free option for various applications, such as tracking cell therapies, pulmonary embolism detection, capillary-level assessments for stroke or traumatic brain injury, and cancer screening. Notably, MPI tracers, retaining magnetism permanently, allow for extended in vivo cell therapy tracking and eliminate the need for time-consuming pre-labeling procedures, presenting a promising alternative for emergency diagnoses. As MPI technology continues to advance, its applications already rival dose-limited sensitivity studies in Nuclear Medicine, highlighting its potential as a transformative imaging modality.

Speaker Bio:
Prof. Conolly received his Ph.D. in Electrical Engineering from Stanford University with Professor Albert Macovski. At Stanford, he specialized in optimizing the technology for Magnetic Resonance Imaging. Prof. Conolly has 30 patents in various stages of approval, and more than half of these have been licensed by the industry. In 2004, Prof. Conolly was a recipient of the prestigious Stanford's Outstanding Inventor Award. Prof. Conolly was elected Chair of the UC Berkeley-UCSF Joint Graduate Group in Bioengineering from 2006-2009 and he served as Vice Chair of Instruction for Berkeley Bioengineering for 9 years. He also serves as the Berkeley PI on the joint UC Berkeley/UCSF Bioengineering NIH T32 Training grant. Prof. Conolly's lab specializes in medical imaging hardware, with a focus on Magnetic Particle Imaging (MPI) and Magnetic Resonance Imaging. Prof. Conolly has won research support from CIRM, NIH, TRDRP, UC Discovery, the Siebel Foundation, and the Keck Foundation. His research group launched a startup company in 2014 called Magnetic Insight to commercialize his lab's MPI patents and expertise. His research group (including graduates from his lab) built all the Magnetic Particle Imaging scanners in the USA.