Department of Electrical and Computer Engineering

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

Spring 2026 Seminar Series

Seminar Title: ***Materials Science at Nanoscale: Radiation Effects and Testing***

Time: 2:00-2:50 PM, Monday, Mar 9, 2026

Location: ECE 101

Speaker:
Yongqiang Wang
Los Alamos National Laboratory

Abstract:
Material degradation due to radiation damage is a persistent challenge when new materials are deployed in nuclear reactors and for space explorations. Radiation effects on material performance largely depend on how the incident irradiation energy is partitioned and dissipated through electrons and atoms of the material as well as how the existing defects in the material (e.g., grain boundaries) facilitate vacancy – interstitial recombination as these point defects are being produced by irradiation and diffuse through the material. Nanostructure or nanophase materials are generally found to enhance radiation tolerance as compared to their bulk counterparts due to increased grain boundary areas acting as efficient defect sinks. So, is the smaller the better for radiation tolerance in a nanostructured solid? What are the boundary conditions to achieve the enhanced radiation tolerance in nanoporous configurations? This talk will look at the fundamental aspects of the radiation damage in nanoscale materials as compared to bulk materials through a few examples. The talk will also briefly review commonly used irradiation sources and research capabilities for conducting radiation damage research and radiation effects testing, including Ion Beam Materials Laboratory at Los Alamos National Laboratory for users at Center for Integrated Nanotechnologies (CINT), a DOE Office of Science user facility jointly operated by Los Alamos and Sandia National Laboratories.

Speaker Bio:
Dr. Yongqiang Wang has spent most of his career in working with electrostatic ion accelerators to carry out materials research, including using energetic ion beams for materials characterization, modification, and radiation damage studies. He currently serves as Team Leader for Radiation Science Experimental Team and Director of Ion Beam Materials Laboratory (IBML) in Materials Science and Technology Division in Los Alamos National Laboratory. He authored/co-authored over 400 publications including three books and two patents. He is Editor of Nuclear Instruments and Methods in Physics Research: Beam Interactions with Materials and Atoms (NIMB); Co-Organizer of Biennial International Conference on Application of Accelerators in Research and Industry (CAARI); and currently serves as Accelerator Application Division Chair for American Nuclear Society.