

MSE SEMINAR

January 19, 2018

113 McBryde Hall

3:30 – 4:30 PM

Refreshments at 3:00 PM

Professor Gary S. Was

Nuclear Engineering and Radiological Sciences
Materials Science and Engineering
University of Michigan

“Irradiation Assisted Stress Corrosion Cracking of Light Water Reactor Core Components”

ABSTRACT

The combination of radiation and a chemically aggressive environment gives rise to unique deformation modes and equally unique degradation modes such as irradiation assisted stress corrosion cracking. IASCC occurs in austenitic alloys exposed to irradiation while under stress in high temperature water. The mechanism is not well understood, but recent evidence has pointed to the interaction between dislocation channels and grain boundaries as a key factor driving the degradation. More specifically, the high local elastic stress at dislocation channel-grain boundary intersections is believed to be the key factor in crack nucleation. Yet very few sites result in crack nucleation. This talk will examine the response of irradiated austenitic stainless steels to stress in high temperature water. The nature of the dislocation channels and of the grain boundaries themselves on the cracking behavior will also be discussed in an effort to understand the selectivity of crack nucleation.

BIOSKETCH

Professor Was is the Walter J. Weber, Jr. Professor of Sustainable Energy, Environmental and Earth Systems Engineering and holds appointments in Nuclear Engineering and Radiological Sciences, and Materials Science and Engineering at the University of Michigan. He has held positions as Director of the Michigan Memorial Phoenix Energy Institute, Associate Dean of the College of Engineering and Chair of the Nuclear Engineering and Radiological Sciences Department. Professor Was's research is focused on materials for advanced nuclear energy systems and radiation materials science, including environmental effects on materials, radiation effects, ion beam surface modification of materials and nuclear fuels. He is a Fellow of TMS, the Materials Research Society, ASM International, NACE International and the American Nuclear Society and Editor-in-Chief of the Journal of Nuclear Materials. Professor Was has published over 250 technical articles in referred, archival journals, presented over 450 conference papers and presentations, delivered 220 invited talks and seminars, and has published a graduate level textbook on Radiation Materials Science in 2007 and a second edition in 2017. Professor Was received the *Presidential Young Investigator* award from NSF, the *Champion H. Matthewson Award* from TMS, the *Outstanding and Special Achievement Awards* by the Materials Science and Technology Division of the American Nuclear Society, the *Henry Marion Howe Medal* from ASM, the *Lee Hsun Award* from the Chinese Academy of Sciences, the *Mishima Award* from ANS and the *Glenn Murphy Award* from ASEE.