



**Friday, April 29<sup>th</sup> | 3:45 PM | ARMS 1010**

**Review of Ongoing Research in the Advanced Manufacturing and Mechanical Reliability Center (AMMRC) at Case Western Reserve University**

**Dr. John J. Lewandowski**—Arthur P. Armington Professor of Engineering II at Case Western Reserve University and Director of the Advanced Mfg and Mechanical Reliability Center (AMMRC)

**Abstract:** This seminar will provide a review of recent and ongoing research works conducted by the speaker and students/collaborators in the Advanced Manufacturing and Mechanical Reliability Center (AMMRC) at CWRU. After a brief review of AMMRC capabilities, the speaker will provide a summary of a few ongoing individual and team research projects in the separate areas of Metal Additive Manufacturing (AM) and Environmental Effects on Fracture of Al-Mg alloys used in a variety of naval applications. AM projects include both powder bed fusion (PBF) as well as directed energy deposition (DED) along with advanced mechanical testing, quantitative fractography, and tomography. The studies on environmental cracking in Al-Mg alloys will include microscopy, extended laboratory aging studies, tomography, field retrieved studies, and possible remediation approaches.

**Biography:** John J. Lewandowski is the Arthur P. Armington Professor of Engineering II at Case Western Reserve University and Director of the Advanced Mfg and Mechanical Reliability Center (AMMRC). His B.S., M.E., and Ph.D. were in Metallurgical Engineering and Materials Science at Carnegie Mellon Univ. as a Hertz Foundation Fellow. His M.E. research was on hydrogen embrittlement of austenitic stainless steels. Ph.D. research focused on hydrogen embrittlement and fracture of rail steels. He also spent two years as Metallurgical Engineer/Failure Analyst at the Richmond Refinery Materials Laboratory, CHEVRON USA. He subsequently spent two years as a NATO/NSF Postdoctoral Fellow in the Department of Materials Science and Metallurgy at Cambridge University, England, working with Prof. John F. Knott, FRS, OBE, on fracture and fatigue of engineering materials. Specific research projects included: stress relief embrittlement and fracture/fatigue of 2 1/4 Cr-1 Mo steels; Pb-induced solid metal embrittlement of aluminum alloy pressure vessels; and impurity effects on fracture of Al-Li alloys. He joined CWRU as an Assistant Professor in 1986. Research and teaching interests are primarily in the areas of processing/structure/property relationships in ferrous and non-ferrous engineering materials; effects of superposed pressure on deformation/fracture; fatigue and fracture of intermetallics and composites, bulk metallic glass, and layered/laminated materials; deformation processing; blast-resistant materials; advanced engineered materials systems; fracture and fatigue of biomedical materials; failure analysis; additive manufacturing. Publications/presentations exceed 330/1000, with an H-index > 55.