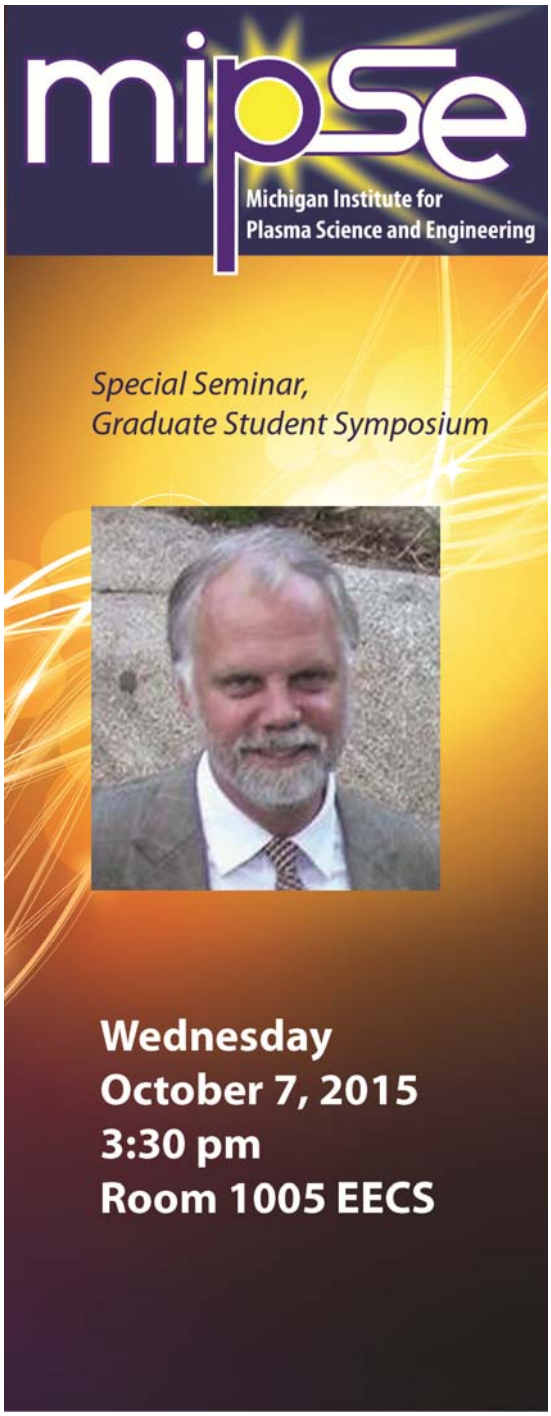

Dr. Edmund J. Synakowski

U.S. Department of Energy

Leading Challenges and the Role of Transformation in the Fusion and Plasma Sciences

The fusion energy and plasma sciences have undergone remarkable transformational events in its history. Many of these events have shaped and reshaped our understanding of what the field's standards for excellence and progress ought to be. Indeed, many scientific developments have enlarged the consciousness of the field regarding what is even possible. Examples in magnetic fusion go all the way back to declassification, when there emerged a common understanding on both sides of the Cold War of the nature of the science of plasmas that emboldened scientists globally to reach for theoretical frameworks that spanned specific experimental configurations. While much of scientific progress is incremental, this talk takes a walk through the history of fusion and plasma science that is decidedly selective, with the choice made to focus on transformational developments that have led to rapid expansions in thinking of what it means to conduct this research. It is with this as backdrop that we can draw inspiration as we view the tasks in hand of establishing the scientific bases for fusion and the plasma sciences, and for mastering control of both the burning plasma and low temperature plasma regimes.

About the Speaker: Dr. Synakowski is the Assoc. Director of Science for Fusion Energy Sciences (FES) at the US Department of Energy. With an annual budget of >$400M, FES includes research at national labs, universities and industry. Prior to joining FES in 2009, Dr. Synakowski was the Fusion Energy Program Leader and Deputy Division Leader At-Large of the Physics Division at Lawrence Livermore National Lab. He has served on the Council of the US Burning Plasma Org., the Exec. Comm. of the APS Division of Plasma Physics, and Chair of the US Transport Task Force (2000-02). Dr. Synakowski was at Princeton Plasma Physics Laboratory from 1988 -2005 where he was Head of Research and Deputy Program Director of the National Spherical Torus Experiment. His research and leadership on the Tokamak Fusion Test Reactor in the 1990's was in cross-magnetic-field transport, where he led detailed comparisons between measurements and turbulent transport theory, and made the only measurements to date of creation and transport of helium ash in a lab fusion plasma. He shared the APS Award for Excellence in Plasma Physics in 2001 and the Princeton U. Kaul Foundation Prize for Excellence in Plasma Physics Research & Technology Development in 2000. A Fellow of the APS and Institute of Physics, he has authored over 160 refereed publications. He received his Ph.D. at the Univ. Texas at Austin in 1988, performing research on the Texas Experimental Tokamak, and his BA from the Johns Hopkins Univ., where he was awarded the Kerr Memorial Medal for Excellence in Physics.