Nanoscience & Microsystems Engineering (NMSE) Seminar

NANOSCIENCE & MICROSYSTEMS ENGINEERING

"An overview of ferroelectric and anti-ferroelectric hafnium oxide thin films for multi-functional microsystems"

Dr. Toshi Nishida, University of Florida

Speaker Bio:

Dr. Toshikazu (Toshi) Nishida is the Associate Dean for Academic Affairs in the Herbert Wertheim College of Engineering and Professor in the Department of Electrical and Computer Engineering (ECE). He received his Ph.D. (1988) and M.S. degrees in Electrical and Computer engineering and B.S. degree in Engineering physics at the University of Illinois at Urbana-Champaign. With colleagues and students, he has published 197 refereed journal and conference papers and received three best paper awards. He has mentored 27 PhD and 21 MS graduate students. The focus of his research group is on high performance multifunctional semiconductor devices and systems, low power ferroelectric memory and device technologies, microelectromechanical systems, device reliability, and novel three-dimensional and flexible fabrication processes. He has 15 issued U.S. patents. Dr. Nishida is the Director of the NSF Industry/University Cooperative Research Center (IUCRC) on Multi-functional Integrated System Technology (MIST) (http://www.mist-center.org) launched in 2014 which is completing its 10th year. The vision of the MIST Center is innovating More than Moore technologies for smart systems in the Internet of Things era. He is a co-founder of the Interdisciplinary Microsystems Group, currently a 10-faculty, 100-member multidisciplinary group (http://www.img.ufl.edu). He received the 2003 College of Engineering Teacher of the Year award, the 2017 University of Florida Term Professorship award, and 2017 Alan Hastings Faculty Fellow. He is a senior member of the IEEE and served as an IEEE EDS Distinguished Lecturer from 2006-2011..

11 AM, Friday, April 11th : VIRTUAL SEMINAR

MS TEAMS LINK:

https://teams.live.com/meet/9327108433957?p=sfxpJysxykHfjmjmU8

Abstract:

Hafnium oxide thin films has garnered significant interest in the semiconductor field since 2008 when it replaced thermal SiO_2 in mainstream CMOS as the high-k dielectric and again since 2011 when ferroelectricity in observed in hafnium oxide thin films doped/alloyed with certain impurities and thermally annealed. Properties of ferroelectric materials and ferroelectric hafnium oxide under various processing conditions will be discussed followed by a discussion of multi-functional applications in memories, logic, and microsystems. Hafnium oxide thin films also exhibit anti-ferroelectric-like properties with specific compositions. Potential applications of anti-ferroelectric hafnium oxide will also be discussed.

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