Seminar: **The Next Digital Revolution - Digital Atomic Scale Manufacturing**

Presenter: **Dr. John Randall, President, Zyvex Labs**

Location: Microelectronics and Engineering Research Center (MER 160), Room 2.114, 10100 Burnet Road, Austin TX 78758

Time: Friday, April 21, 2017, at 3:30 PM CDT.

Abstract: The World changed dramatically when our computing, communication, and information storage went from analog to digital. Another digital revolution is near. This will happen when our fabrication technology converts from analog (treats matter as if it is infinitely divisible) to a digital approach which employs the quantized nature of matter. I will describe our atomically precise patterning technique that achieves sub-nm resolution that is a fully digital fabrication technique and how we are exploiting it to develop atomic scale fabrication. I will also give some thoughts about how we can develop digital atomic scale fabrication that will tolerate fabrication errors via error detection and correction and produce error-free structures. Our ultimate goal is the development of Atomically Precise Manufacturing where inevitable fabrication errors are detected and corrected. This technology will provide the nano-foundries required to produce the large array of nanotechnology products that have been promised but not yet delivered. **It is time for nanofabrication to go digital.**

John N. Randall, son of Bill R. Randall (UT PhD Chemical Engineer), was born in Berkeley CA but got to Texas as fast as he could. He spent a major portion of his misspent youth as a professional student. When he ran out of EE degrees to earn at the University of Houston, he was forced to get a job. For mysterious reasons he joined MIT's Lincoln Laboratory, which was an excellent place to work, and was near the great city of Boston which is cursed with terrible weather. After three Boston winters, Patrice (John's wife who has much greater wisdom) insisted that they move back to Texas. John worked at Texas Instruments Central Research Laboratory for 10 years making quantum resonant tunneling devices. He changed jobs within TI to accept a two year position at IMEC in Belgium where he worked on optical lithography and acquired an affinity for Belgian beer and chocolate. After returning to Dallas he worked in TI's Kilby Fab and was lithography gate team leader for TI's most advanced IC process. In 2001 Jim Von Ehr made John an offer he could not refuse (to work on really cool technology at Zyvex) and tricked him into being in management. In spite of this, Zyvex developed two successful nanotechnology product lines: Nano probing which is used by semiconducting companies all over the world, and carbon nanotube enhanced composites which are used to make baseball bats, hockey sticks, bicycle parts, and 54 foot boats. John is presently President of Zyvex Labs which is working (in collaboration with UT Austin & others) to change the world with Atomically Precise Manufacturing and to heal the blind. He has published 107 technical articles, has 30 issued US patents, and loves his wife and children.