



## Assembly Manufacturing at the Micro and Nano Scales

Zyvex is a Nanotechnology company that is working towards atomically precise nanomanufacturing. While working toward that goal we are developing materials, tools, and structures that have current commercial relevance to research and industrial applications. This talk will introduce Zyvex and will touch on our carbon nanotube materials, and nanomanipulation businesses. The majority of the presentation will be a discussion of microsystem assembly technology. The past several decades have brought a general trend of miniaturization with huge economic benefits and great convenience. Most of this progress has been in the semiconductor industry. However, the progress in assembly manufacturing is far less impressive. Described in this talk is an approach to parallel assembly of microsystems that uses Si micro electro mechanical systems (MEMS) as an integral part of the assembly technology that has been developed to date and the rapid progress that is being made toward the assembly of micro-systems of commercial value. Finally, our efforts in the area of atomically precise nanomanufacturing (including a collaboration with Joe Lyding of UIUC) will be presented.



**John Randall**  
Chief Technology Officer  
Zyvex Corporation

*John Randall has 25 years of experience in Micro- and Nano- Fabrication. He joined Zyvex in March of 2001 after 15 years at Texas Instruments where he worked in high resolution processing for integrated circuits, MEMS, and quantum effect devices. Prior to working at TI, John worked at MIT's Lincoln Laboratory on ion beam and x-ray lithography. He has over 100 technical publications and 18 issued patents.*

Wednesday, December 10, 2003  
4:00 p.m.  
B02 Coordinated Science Lab  
Reception immediately following  
in the lobby of CSL