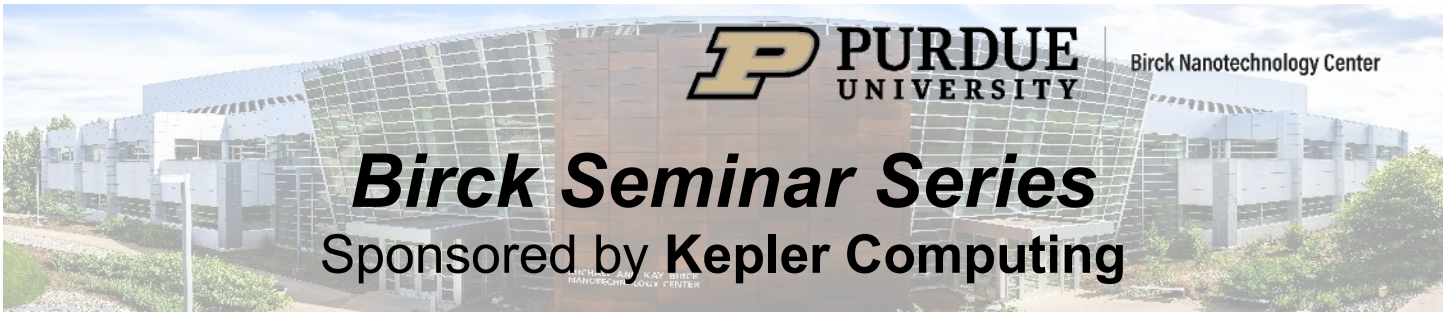

Boosting MEMS Innovation for Materials to Systems

Dana Weinstein

Professor, Elmore Family School of Electrical & Computer Engineering

April 8th @ 2:00 pm in BRK 1001

Coffee and snacks served before seminar

also on MS Teams

Abstract: The semiconductor community is facing a pivotal opportunity with unprecedented investments and widespread recognition of the need for leap-ahead technologies. New materials, device architectures, and heterogeneous systems are now sought with a low-barrier path to adoption by the industry. Microelectromechanical Systems (MEMS) provide important and unique functionality for the CMOS+X roadmap, coupled with leadership in advanced packaging innovation. How can transducers leverage existing and emerging semiconductor platforms? How can we boost performance and create new capabilities with strategic materials and devices? MEMS underpin navigation, timing, and RF and mm-wave wireless communication, and are emerging in imaging and medical diagnostics and therapeutics. Materials-device co-design in particular can push the limits of MEMS performance with long-term stability deployed in harsh environments, power-constrained applications, and under adversarial conditions.

This talk addresses my lab's broader work in CMOS+MEMS and our recent advances in sensors for harsh environments in response to national defense needs. I will also discuss AI/ML as a unique opportunity to redefine the innovation engine for MEMS and microelectronics writ large, accelerating materials exploration, optimizing devices, guiding system-level design, and transforming labs with autonomous experimentation. This latter topic is imperative to the whole of the research community, and something I had the privilege of championing in my service as Principal Assistant Director and Special Advisor for CHIPS R&D in the White House Office of Science and Technology Policy (OSTP). I'll share some of my experience in that role and perspectives on the path forward.

Bio: Dana Weinstein is a Professor in Purdue's Elmore Family School of Electrical and Computer Engineering, and co-chair of the Defense Innovation Purdue Engineering Initiative. Prior to joining Purdue in 2015, Dr. Weinstein was a Professor at MIT in the Department of Electrical Engineering and Computer Science. She received her B.A. in Physics and Astrophysics from UC Berkeley in 2004 and her Ph.D. in Applied Physics in 2009 from Cornell. She is a Purdue Faculty Scholar, and a recipient of IEEE UFFC Sawyer Award, the NSF CAREER Award, the DARPA Young Faculty Award, the first Intel Early Career Award, the first TRF Transducers Early Career Award, and the IEEE IEDM Haken Award. Dr. Weinstein's research focuses on innovative microelectromechanical devices for applications ranging from MEMS-IC wireless communications and clocking to harsh environment sensors and ultrasonic stimulation. She has served as Associate Director for Purdue's Birck Nanotechnology Center, as Associate Dean in the College of Engineering at Purdue, and recently as Principal Assistant Director and Special Advisor for Microelectronics Research and Development at the White House Office of Science and Technology Policy in DC. In that role, she also championed accelerating materials innovation through autonomous experimentation.

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