MECHANICAL ENGINEERING **SEMINAR**

A soft approach to electronics: from nanowire arrays to stretchable systems

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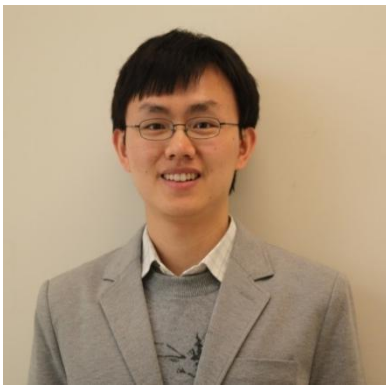
Wearable devices that match the soft human body represent an important trend in bio-integration; the resulting search for pliable electronic materials call for strategies to bridge the gap between hard and soft – among which advanced engineering of the geometry and architecture of materials present unique opportunities. A prominent example of geometry engineering are nanowires of piezoelectric oxides which can act as a flexible energy source; their synthesis, properties and integration into energy harvesting devices will be discussed. For architecture engineering, the compressive straining of an elastic substrate can be used to fabricate previously inaccessible classes of 3D structures in monocrystalline materials and conversely, rationally designed 2D geometries can buckle to form 3D layouts to accommodate tensile strain, resulting in unprecedented stretchability. This enables a series of device possibilities in stretchable electronics, including lithium ion batteries with record stretchability and integrated soft health monitoring systems.



Dr. Sheng Xu is currently a postdoctoral research associate at the University of Illinois Urbana-Champaign, where he is working with Dr. John Rogers on stretchable electronics, including ultra-stretchable micro/nanostructures, energy storage devices, and mobile healthcare systems. He received his Ph. D. in Materials Science and Engineering from Georgia Institute of Technology in 2010, where his research focused on rational oxide nanowire synthesis, nanowire array based light emitting diodes and mechanical energy harvesters with Dr. Zhong Lin (Z.L.) Wang. His research interests primarily focus on advancing the interdisciplinary science and technology of soft electronics, energy materials, and nanotechnology.

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10:30-11:30am
Room 214 Mudd