



## Advanced Transfer Printing Technology for Wearable Biomedical Applications

Wednesday, May 16  
1:00 - 2:00 p.m.  
NanoES 291

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### Abstract

Emerging transfer printing methods provide means to realize a range of mechanically flexible, ultrathin bio-integrated electronics, opening up a new prospect in many biomedical devices and technologies. The mechanical flexible and ultrathin characteristics allow the devices to intimately integrate with biological systems such as biological cells, organs, and skins at their length scale. The embedded semiconducting nanomaterials provide the functionalities that can monitor the clinically useful bio-signals with sufficient spatial and temporal controls. This presentation will introduce two different kinds of novel transfer printing methods by exploiting controlled 'cracks' that enable the physical separation of diverse bio-electronics from their original fabrication silicon wafer, thereby can be utilized in many wearable and implantable biomedical applications. Conformal skin-mountable sensors and cell-injectable silicon nano-needles will be discussed to show the representative applications in wearable healthcare monitoring and intracellular drug delivery. Discussions about the results of detailed experimental and theoretical studies will be followed to reveal the essential attributes of the materials, mechanics, fabrication processes, and system configurations.

### Presenter



#### Chi Hwan Lee

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Dr. Chi Hwan Lee is an Assistant Professor at Purdue University, with joint appointments in the Departments of Biomedical Engineering & Mechanical Engineering. He has served as a Primary Faculty Member in the Center for Implantable Bioelectronics, the Center for Scalable Manufacturing, and the Birck Nanotechnology Center at Purdue University where his main research focus lies on developing mechanically flexible and stretchable wearable biomedical devices. Prior to joining at Purdue, he finished the postdoc training in Prof. John A. Rogers Group in the Department of Materials Science and Engineering at University of Illinois at Urbana-Champaign. He obtained a Ph.D. in Mechanical Engineering from Stanford University in 2013 under supervision of Prof. Xiaolin Zheng. He received B.S. degree in Mechanical Engineering from Illinois Institute of Technology in 2007. Washington, D.C.

