UNIVERSITY OF CALIFORNIA

UC RIVERSIDE

**The Department of
Mechanical Engineering**
PRESENTS

Ethan Cho, Ph.D.

Post Doctoral Researcher
University of California, Riverside

**Friday, February 16, 2018
WCH Room 205/206
11:10-12:00PM**

Superconducting Devices for Biomedical Applications

Abstract:

In this talk he will introduce the fundamental concepts of Josephson junctions, a fundamental building block of superconducting devices and superconducting quantum interference devices (SQUIDs) – a type of magnetometer. The fabrication of high-temperature superconductor Josephson junctions has been a challenge since the discovery of high-temperature superconductors. Using the newly developed helium ion microscope by Carl Zeiss, Josephson junctions can be directly written in the superconductor. This presentation will demonstrate recent results from focused helium ion beam Josephson junctions and SQUIDs. The focus of this talk will be on three main projects that his lab is working on and future projects. This includes a collaboration with Boston's Children's hospital on a NIH SBIR SQUID microscope for observing single neurons and glial cells activities in the kHz range. Also, the UCOP Multicampus Research Program and Initiatives for SQUID MEG to improve the sensitivity and signal-to-noise-ratio to study the human brain. Lastly the joint effort between UCR's bioengineering chair, Dr. Xiaoping Hu to develop a low field SQUID MRI to examine di-agnose tissue.

About the Speaker:

The presenter got his B.S. in Physics from National Tsing Hua University and his Ph. D. in Physics from University of California, San Diego. Currently, he is a post-doctoral researcher at University of California, Riverside. His primary focus for his Ph.D. thesis is on focused helium ion beam Josephson junctions and he is now continuing this work by exploring a wide range of its potential applications and improvements to the field of biomedical imaging and spectroscopy, wide band communications, magnetic field geo-survey, and THz imaging and spectroscopy.