

The Department of Mechanical Engineering  
College of Engineering and Applied Sciences  
Stony Brook University  
**Mechanical Engineering Seminar**



**Dr. Jun Chen, Post-doc Scholar**  
**Department of Materials Science and Engineering, Stanford University**

**Lecture Title: Triboelectric Nanogenerators**

Friday, March 3<sup>rd</sup>, 2017 at 11AM, Room 173 Light Engineering

**Abstract**

With the threatening of global warming and energy crises, searching for renewable and green energy resources with reduced carbon emissions is one of the most urgent challenges to the sustainable development of human civilization. In the past decades, increasing research efforts have been committed to seek for clean and renewable energy sources as well as to develop renewable energy technologies. Mechanical motion ubiquitously exists in ambient environment and people's daily life. In recent years, it becomes an attractive target for energy harvesting as a promising supplement to traditional fuel sources and a potentially alternative power source to battery-operated electronics. Until recently, the mechanisms of mechanical energy harvesting are mainly limited to transductions based on piezoelectric effect, electromagnetic effect, electrostatic effect and magnetostrictive effect. Widespread usage of these techniques is likely to be shadowed by possible limitations, such as structure complexity, low power output, fabrication of high-quality materials, reliance on external power sources and little adaptability on structural design for different applications. In 2012, triboelectric nanogenerator (TENG), a creative invention for harvesting ambient mechanical energy based on the coupling between triboelectric effect and electrostatic effect has been launched as a new and renewable energy technology. The concept and design presented in this talk can greatly justify the development of TENG as both sustainable power sources and self-powered active sensors. And it will greatly help to define the TENG as a fundamentally new green energy technology, featured as being simple, reliable, cost-effective as well as high efficiency.

**Biography**

**Dr. Jun CHEN** received his Ph.D. in Materials Science and Engineering from Georgia Institute of Technology under the supervision of Prof. Zhong Lin Wang in 2016. Currently, he is a post-doc scholar with Prof. Yi Cui at Stanford University. His research focuses primarily on nanomaterial-based energy harvesting, energy storage, active sensing and self-powered micro-/nano-systems. He has already published 2 books, 66 journal articles and 35 of them are as first-author in prestigious scientific journals, such as *Nat. Energy*, *Nat. Commun.*, *ACS Nano*, *Adv. Mater.*, *Nano Lett.*, and so on. And still, he filed 11 US patents and 15 Chinese patents. His research on triboelectric nanogenerators has been reported by worldwide mainstream media over 600 times in total, including *Nature*, *PBS*, *The Wall Street Journal*, *Washington Times*, *Scientific American*, *NewScientist*, *Phys.org*, *ScienceDaily* and *Newsweek*. Jun also received the 2015 Materials Research Society Graduate Student Award, and the 2015 Chinese Government Award for Outstanding Students Abroad. His current H-index is 36.

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