



Invited speaker's information form of IUMRS-ICA2017

Presentation on Symposium of “**smart materials (D7)**”



Presentation title: Piezoelectric and Triboelectric Nanogenerators for Powering Small Electronics

Speaker's name and affiliation: Sang-Woo Kim, Sungkyunkwan University (SKKU)

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Brief biography of Speaker:

Sang-Woo Kim is full professor and SKKU fellow in the Department of Advanced Materials Science and Engineering at Sungkyunkwan University (SKKU). He received a Ph.D. in Electronic Science and Engineering from Kyoto University in 2004. After working as a postdoctoral researcher at Kyoto University and University of Cambridge, he spent 4 years as an assistant professor at Kumoh National Institute of Technology. He joined SKKU in 2009. He recently received MCARE 2016 Award (ACerS-KICChE), The Republic of Korea President's Award for Scientific Excellence (2015), National Top 100 Research Award (2015), etc. His recent research interest is focused on piezoelectric/triboelectric nanogenerators, photovoltaics, and 2D materials including graphene, h-BN, and TMDs. He has published over 200 research papers (h-index of 46) and holds over 80 domestic/international patents. Now he is a director of SAMSUNG-SKKU Graphene/2D Research Center and is leading National Research Laboratory for Next Generation Hybrid Energy Harvester. He is currently serving as an Associate Editor of *Nano Energy* (Elsevier) and an Executive Board Member of *Advanced Electronic Materials* (Wiley).

Abstract:

Energy harvesting systems based on piezoelectric and triboelectric nanomaterials are in great demand, as they can provide routes for the development of self-powered devices which are highly flexible, stretchable, mechanically durable, and can be used in a wide range of applications. Our recent research interest mainly focuses on the fabrication of piezoelectric and triboelectric power generators based on various kinds of nanomaterials. Flexible generators exhibit good performances and are easy to integrate which make it the perfect candidate for many applications, and therefore crucial to develop. In this presentation, I firstly introduce the fundamentals and possible device applications of piezoelectric and triboelectric nanogenerators, including their basic operation modes. Then the different improvement parameters will be discussed. As main topics, I will present a couple of recent achievements regarding highly stretchable piezoelectric-pyroelectric hybrid generators, transparent flexible triboelectric nanogenerators, textile-based wearable triboelectric nanogenerators, highly robust nanogenerators with a shape memory function etc. The recent research and design efforts for enhancing power generation performance of nanogenerators to realize self powering of portable and wearable sensors and electronics will also be discussed in this talk.

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