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Topic of the Speech:

Nanogenerator - Energy Harvesting and Delivery for Self-powered Human Interface Devices

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Professor Sang-Woo Kim is a Full Professor and SKKU Distinguished Professor (SKKU fellow) 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-KIChE), 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 58) and holds over 100 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 SUBMISSION

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ABSTRACT (NO MORE THAN 500 WORDS:)

Energy harvesting systems based on 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 high-performance triboelectric nanogenerators (TENGs) based on various kinds of nanomaterials. Flexible TENGs 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 TENGs, 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 transparent flexible TENGs, textile-based wearable TENGs, highly robust and efficient TENGs with multifunctional materials, etc. The recent research and design efforts for enhancing power generation performance of TENGs to realize self powering of wearable and body-implanted electronics will also be discussed in this talk. Finally I am going to introduce a 2D materials-based tribotronics for possible future application toward tactile sensors, robots, security, human-machine interfaces, etc.