

Carnegie Mellon

Materials Science and Engineering Seminar Series

Philip Kim

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Department of Physics

“Toward Graphene Quantum Electronics”

Friday, February 24, 2012
11:30AM Seminar in Wean Hall 7500

Graphene has been provided us opportunities to explore exotic transport effect in low-energy condensed matter systems and the potential of carbon based novel device applications. In this presentation I will discuss the exotic quantum transport behavior discovered in graphene nanostructures in the relation to the device applications beyond CMOS operation. In particular, I will present quantum carrier collimation both of which appear even at room temperature employing graphene lateral heterojunction. In addition, I will discuss the enhanced device performance of suspended graphene devices and graphene with a novel substrate.

Professor Philip Kim was born in Seoul, Korea in 1967. He received his B.S and M.A in physics at Seoul National University in 1990 and 1992, respectively. After then, he came to US and received his Ph. D. in Applied Physics from Harvard University in 1999. He was Miller Postdoctoral Fellow in Physics from University of California, Berkeley during 1999 2001. In 2002, he joined in Department of Physics at Columbia University as a faculty member, where he is now Professor of Physics. Professor Kim is a world leading scientist in the area of materials research. His research area is experimental condensed matter physics with an emphasis on physical properties and applications of nanoscale low-dimensional materials. The unique properties of low dimensional systems are generally understood by considering enhanced quantum effects and increased correlations due to the reduction of available phase space. The focus of Professor Kim's research is the mesoscopic investigation of transport phenomena, particularly, electric, thermal and thermoelectrical properties of low dimensional nanoscale materials. Notably in recent years, Prof. Kim has demonstrated novel transport phenomena in low-dimensional graphitic nanomaterials such as carbon nanotubes and graphene. Professor Kim published more than 100 papers in professional journals which are well cited. Professor Kim received numerous honors and award including Dresden Barkhausen Award (2011); IBM Faculty Fellowship (2009), Ho-Am Science Prize (2008), American Physical Society Fellow (2007), Columbia University Distinguished Faculty Award (2007), and National Science Foundation Faculty Career Award (2004).