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## 1D electron confinement in a graphene nano wrinkle

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One of the unique properties of the sp<sup>2</sup>-carbon allotropes, such as fullerenes, carbon nanotubes and graphenes, is that their electronic structures differ significantly among them according to characteristic electron confinement based on their dimensionality and geometric structures, which can be influenced not only by charge injection and chemical bonding but also structural modification. In this talk, I will discuss the electronic structures of various sp<sup>2</sup>-carbon allotropes on metal substrates investigated by scanning tunneling microscopy and spectroscopy. In particular, it is focused on the one dimensional (1D) electronic structure in a graphene nano wrinkle (GNW) of an epitaxially grown graphene (EG) sheet on Ni(111), the width of which was small enough (less than 5 nm) to cause 1D electron confinement. Use of spatially resolved, scanning tunneling spectroscopy revealed band-gap opening and a 1D van Hove singularity in the GNW, as well as the chemical potential distribution across the GNW. Our demonstration of 1D electron confinement in an EG is the novel possibility of controlling its electronic properties not by chemical modification but by mechanical structuring in a controlled manner.

### Biography

Yousoo Kim was graduated from the Department of Chemistry, Seoul National University, where he has also obtained his Master's degree in 1993. In 1999, he has earned his PhD in Applied Chemistry from The University of Tokyo. In the same year, he has joined RIKEN as a Post-doctoral Researcher. Since 2010, he has been the Director of the Surface and Interface Science Laboratory at the RIKEN. He has published more than 120 papers in reputed journals. His research focuses on describing the details of energy transport and conversion on solid surfaces and interfaces in the nanoscale regime by combined study of scanning probe microscopy/spectroscopy.

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