



IBS Center for Molecular Spectroscopy and Dynamics

COLLOQUIUM

■ **SPEAKER**

Prof. Young L. Kim (Weldon School of Biomedical Engineering, Purdue Quantum Center)

■ **TITLE**

Anderson light localization in natural/biological tissue and its implications

■ **ABSTRACT**

Our group has been interested in better understanding possible origins of vibrant, sparkling, and bright appearance in natural/biological media. Objects found in nature often have 'lustrous' or 'silvery' colors. This type of color appearance drives our research to figure out why and how such an incredible array of reflections exist in nature. In particular, we are interested in applying the concept of mesoscopic light-matter interactions; light waves can undergo strong light scattering in the same manner of Nobel Prize winner Anderson's theory. Conventional experimental studies for realizing light localization rely on semiconductor materials with high-refractive-indices. However, this approach is not only limited by material toxicity and biocompatibility, but also deprives us of scalable, economical, and eco-friendly production for widespread utilizations. In this respect, strong light scattering in biological and natural tissue could potentially lead to a variety of novel applications, including for a variety of biomedical, energy harvesting, and quantum information applications.

Fortuitously, we have recently found that nanostructures/nanomaterials in nature allow for mesoscopic light-matter interactions, proximal to the Anderson regime. In other words, we have identified common biological or natural tissue that take advantage of their own nanoarchitecture and overcome the fundamental limitations of the constituent materials, resulting in superior optical properties. We envision that this biogenic approach can open new possibilities of better understanding light-matter interactions in complex media, developing scalable nanophotonics devices, and eco-friendly producing photonics nanomaterials.

■ **DATE AND VENUE**

July 23, 2018 (Monday, 5:00 - 6:00 pm)
Seminar Room 116, KU R&D Center

■ **LANGUAGE**

Korean

■ **INVITED BY**

Associate Director Wonshik Choi