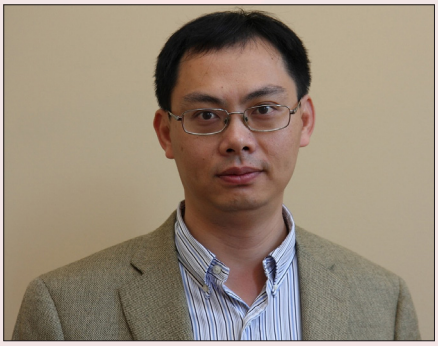
Nebraska Center for Materials and Nanoscience

2019 Fall Seminar Series

Professor Li Yang

Department of Physics
Washington University in St. Louis



Light-Matter Interactions at the Nanoscale and Beyond

In this talk, I will start from a general picture of light-matter interactions, such as quasiparticles and excitons, in solids and how to calculate them by first-principles approaches. Then I will focus on light-matter interactions of nanoscale materials, in which the reduced dimensionality substantially enhances many-electron interactions by orders of magnitude and results in unique excited-state properties, such as strongly polarized excitons and exciton liquids.

By clarifying and calculating electron-electron, electron-hole, and electron-plasmon interactions, we can accurately explain many important measurements and provide new ideas to engineer light-matter interactions for exploring new science and realizing device and energy applications.

Finally, beyond light-matter interactions, I will show how to combine different levels of first-principles tools and models to predict a wide range of electric and magnetic polarizations of solids and their applications.

Li Yang received his BS (1997) and MS (2000) from the Beijing Normal University and PhD from the Georgia Institute of Technology (2006). From 2006 to 2009, he had worked as a postdoctoral fellow at the University of California, Berkeley.

In 2009, he joined the faculty of the physics department of the Washington University in St Louis. He received the Faculty Early Career Development Award (CAREER) from the National Science Foundation (NSF) in 2015 and was selected into the name list of the world's most impactful scientific researchers (2017) by Clarivate Analytics (Web of Science).

Using first-principles simulations and models, his group are working on condensed matter physics and studying fundamental electronic structures, transport, polarization, and excited-state properties of reduced dimensional materials.

NCMN

November 6, 2019 | 4 p.m. | 136 Jorgensen Hall
Refreshments in 1st floor vending area at 3:45

Host: Xiaoshan Xu
Department of Physics & Astronomy