

世纪物理情·系列讲座

# Fermi polaron in doped 2D semiconductors

## 【摘要】

The Fermi polaron, a particle dressed by excitations of a fermionic medium, has been extensively studied in ultracold atomic gases. Recently, it was realised that the optical response of doped atomically thin semiconductors also corresponds to a quantum impurity problem, where excitons are introduced into an electronic medium. I will discuss three scenarios where we have recently used cold-atom-inspired Fermi polaron theories to explain results in doped semiconductors. The first scenario involves applying the quantum virial expansion to describe photoluminescence. The second scenario focuses on the observation that the relaxation from the repulsive to the attractive branch can be enhanced in doped semiconductors. Finally, we will investigate how interactions between impurities may be probed using multidimensional spectroscopy. These examples in turn have the potential to shed new light on the cold atom polaron problem.

## 【报告人简介】



Jesper Levinsen received his BSc in physics from the University of Copenhagen in 2003 and PhD degree from the University of Colorado at Boulder in 2007. From 2008 to 2010, he conducted postdoctoral research at Université Paris Sud. He then held fellowships at the University of Cambridge from 2010 to 2013 and at Aarhus Institute of Advanced Studies 2013 to 2014. Currently, he is an Associate Professor at the School of Physics and Astronomy at Monash University. His recent research interests include strongly interacting quantum systems, impurities in degenerate quantum gases, and strongly coupled light-matter systems.

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