

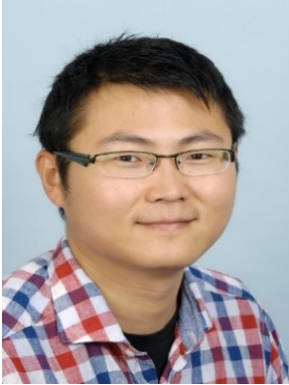
17 Dec Friday

2:15 – 3:00

Chair: ARIANDO

Valleytronics By Layer Engineering

Professor GAO Weibo (高炜博), Nanyang Technological University of Singapore, Singapore



Professor GAO Weibo, born in 1984, received his Bachelor in 2005 from University of Science and Technology of China, and PhD from the same university in 2010, under the supervision of Professor Jianwei Pan. From 2010 to 2014, he worked as a Postdoc and Marie Curie Fellowship in ETH, Zurich. He joined Nanyang Technological University (NTU) as an assistant Professor in 2014. The same year, he has won National Research foundation fellowship award. From 2019, he serves as tenured professor and provost's chair professor in Physics in NTU. His current research interest is quantum photonics and condensed matter physics based on solid state systems.

Abstract:

The development of information processing devices with minimum carbon emission is crucial in this information age. One of the approaches to tackle this challenge is by using valleys (local extremum points in the momentum space) to encode the information instead of charges. The valley information in some material such as monolayer transition metal dichalcogenide (TMD) can be controlled by using circularly polarized light as well as electric field. In this report, we focus on another knob for tuning the valley properties in these materials---- Layers, thanks to the Lego-type structure of 2D van der Waals heterostructures. Layer degree of freedom can not only increase the valley lifetimes and raise the operation temperature for valleytronic devices, but also introduce Moiré physics into the valleytronic devices.