



中国科学院半导体研究所

黄昆半导体科学技术论坛

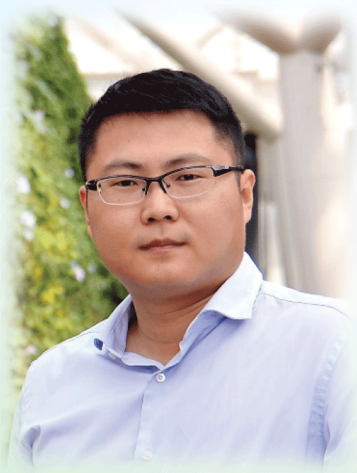
第 366 期讲座

Title: Valleytronics and correlated phase probed by interlayer excitons in 2D heterostructures

Speaker: Pro. Weibo Gao(School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore)

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. We will talk about valleytronics and correlated phase probed by interlayer excitons in 2D heterostructures.

Biography: Weibo Gao, born in 1984, received his Bachelor in 2005 from University of Science and Technology of China, and PhD from the same university in 2010. 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. He published on high impact publications including 31 Nature/Science series journals, 12 in Phys. Rev. Letters. He has won a number of awards for his creative work, including 2017 Singapore President's Young Scientist Award (YSA). He serves as Associate Editor for Photonics Research, and Editorial board member for Materials for Quantum Technology, Journal of Physics: Materials, Chinese Physics B and Acta Physica Sinica.



时 间: 2023年6月6日 (星期二) 下午3:00

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