



### Special Seminar

## Surface Magnetism and Fractionalization

### Prof. Gang Chen

Department of Physics, The University of Hong Kong



**Time: 2: 30 pm, Jan. 7, 2022(Friday)**

**时间: 2022年1月7日 (周五) 下午2:30**

**腾讯会议链接: <https://meeting.tencent.com/dm/9hJCxNIKNeYX>**

**腾讯会议: 680-140-348 , 会议密码: 210107**

#### Abstract

I will first talk about the interplay between the surface magnetism and time reversal symmetry protected Dirac electrons on the surface of 3d topological insulator. In addition to the simple ferromagnetism, there exist other competing magnetic states that include spiral antiferromagnets and skyrmion lattice. We further show that the novel magnetic structure feeds back to the itinerant electrons on the surface, generating distinct electron structures and surface states. I will then discuss the surface fractionalization in a 3d cluster Mott insulator. It is observed that, the surface generates local moments in an anomalous fashion and these moments could lead to exotic fractionalized spin liquid states.

#### references:

CK Li, XP Yao, G Chen Twisted magnetic topological insulators. *Phys. Rev. Research* **3**, 033156 (2021)

CK Li, XP Yao, JP Liu, G Chen Fractionalization on the surface: Is type-II terminated 1T-TaS<sub>2</sub> surface an anomalously realized spin liquid? *arxiv preprint* 2109.08093

#### About the speaker

Professor Gang Chen is currently Professor of Physics at the University of Hong Kong. He received his bachelor's degree from USTC in 2004 and graduated with the University's highest honor, and PhD in 2010 from Univ of California, Santa Barbara. He was awarded the Daniel Tsui Fellowship from The University of Hong Kong in 2017, and Qiushi outstanding Youth scientist in 2018. Professor Chen has a broad interest in condensed matter theory, and most of his works are experimentally motivated. Besides his research, he is also known as an excellent collaborator for experiments and an inspiring mentor for students and postdoc.