北京大学量子材料科学中心

Seminar

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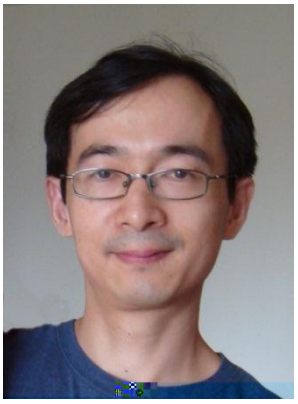

Time: 4:00pm, May 31, 2016 (Tuesday)

2016 5 31 4:00

Venue: Room w563, Physics building, Peking University

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It is more recognized than ever that exotic topological states of matter can be induced by periodic driving. Examples include Floquet topological insulator or Floquet Weyl semimetal etc. This work proposes a Floquet semimetal with Floquet-band holonomy. That is, the system is gapless, and as a periodic parameter viewed as quasimomentum of a synthetic dimension completes an adiabatic cycle, each Floquet band as a whole exchanges with other Floquet bands. The dynamical manifestations of such Floquet-band holonomy are studied. Under open boundary conditions. anomalous chiral edge states localized only at one edge, winding around the entire quasienergy Brillouin zone and well separated from the bulk states are discovered. The holonomy behavior of the anomalous edge states is found to be different from the bulk states. The remarkable properties of the edge states are further exploited to realize quantized or half-quantized edge state pumping. All these results are of experimental interest.

References:

1.Floquet Semimetal with Floquet-band Holonomy, by L.W. Zhou, C. Chen, and J.B. Gong, work under review.

2.Floquet Topological Semimetal Phases of an Extended Kicked Harper Model, **PRE** 93, 022209 (2016) (Editors Suggestion), by R.W. Bomantara, G.N. Raghava, L.W. Zhou, and J.B. Gong.

3.Topological Effects in Chiral Symmetric Driven systems, **PRB** 90, 195419 (2014), by D.Y.H. Ho and J.B. Gong.

4.Generating Many Majorana Modes via Periodic Driving: A Superconductor Model, **PRB** 87, 201109 (R) (2013), by Q.J. Tong, J.H. An, J.B. Gong, H.G. Luo, and C.H. Oh.

5.Quantized Adiabatic Transport in Momentum Space, **PRL** 109, 010601 (2012) (Suggestion), by D.Y.H. Ho and J.B. Gong.

Dr. Gong Jiangbin obtained his B. Sc in 1993 from Department of Physics, Nanjing University. Subsequently he did his graduate studies at Nanjing University and University of Toronto. He did his postdoctoral research in the Chemical Physics Theory Group at the University of Toronto and the James Franck Institute, University of Chicago. Dr. Gong joined NUS in 2006 as an Assistant professor, promoted to Associated Professor with tenure in 2010 and full Professor in 2015. He also won a number of faculty level or university level teaching awards at NUS. His theoretical research interests include nonlinear dynamics and quantum chaos, quantum control and quantum simulation, nanoscale quantum thermodynamics, and topological phases of matter.