International Max Planck Research School
for Condensed Matter Science
Workshop
Stuttgart, Germany

Frontiers of Quantum Materials

- Spectroscopy
- Non-equilibrium phenomena
- Low-dimensional materials
- Many-body theory
- Quantum transport
- Novel materials
- Spin liquids

Scientific Organizers

Prof. Bernhard Keimer
Max Planck Institute
for Solid State Research

Prof. Yuan Li
Peking University

Dr. Eva Benckiser
Max Planck Institute
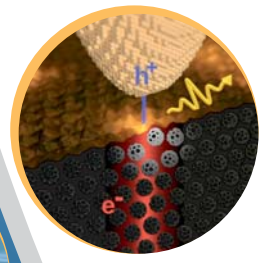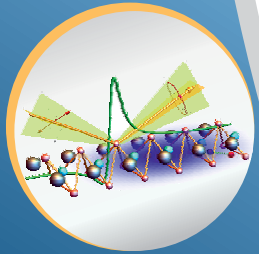for Solid State Research

contact@imprs-cms.mpg.de

Location

**Max Planck Institute
for Solid State Research
Heisenbergstraße 1
70569 Stuttgart
Germany**

Program

Location

**Werner Köster
Lecture Hall
2R4**

トポロジーが紡ぐ
物質科学の
フロンティア

MAX PLANCK
GRADUATE CENTER
FOR QUANTUM MATERIALS

Monday July 1, 2019

Time	Session	Speaker / Talk	Affiliation
8.30 – 8:55 am		**Registration**	
8:55 – 9.00 am		**Bernhard Keimer** — Welcome	MPI for Solid State Research
9.00 – 9.30 am	Quantum transport	**Xincheng Xie** — Topological properties of Jackie-Rebbi zero-modes	Peking University
9.30 – 10.00 am	Quantum transport	**Jurgen Smet** — Partons in condensed matter?	MPI for Solid State Research
10.00 – 10.30 am	Quantum transport	**Toshimasa Fujisawa** — Non-equilibrium charge dynamics in quantum-Hall edge states	Tokyo Institute of Technology
10.30 – 11.00 am		Coffee Break	
11.00 – 11.30 am	Quantum transport	**Wei Han** — Spin Current: a Probe for Quantum Materials	Peking University
11.30 – 12.00 am	Quantum transport	**Stuart Parkin** — Oxide meso-structures formed by ionic liquid gating	MPI for Microstructure Physics
12.00 – 12.30 pm	Quantum transport	**Yanzhao Liu** — Discovery of Log-periodic Quantum Oscillations	Peking University
12.30 – 1.30 pm		Lunch Break	
1.30 – 2.00 pm	Materials	**Qinglin He** — Topology and Antiferromagnetic Proximity Interactions at $(Bi,Sb)_2Te_3$-based Interfaces	Peking University
2.00 – 2.30 pm	Materials	**Jun Fujioka** — Strong-correlation induced high-mobility electrons in Dirac semimetal of perovskite iridates	University of Tsukuba
2.30 – 3.00 pm	Materials	**Christian Ast** — Sensing the Quantum Limits in Scanning Tunneling Spectroscopy	MPI for Solid State Research
3.00 – 3.30 pm		Coffee Break	
3.30 – 3.50 pm	Student talks	**Jian Sun** — Bulk properties of the 5/2 fractional quantum Hall state with Corbino geometry	Peking University
3.50 – 4.10 pm	Student talks	**Yi Lu** — Resonant inelastic x-ray scattering study of rare-earth nickelates	University of Heidelberg
4.10 – 4.30 pm	Student talks	**Zhongdong Han** — Anomalous Conductance Oscillations in the Hybridization Gap of InAs/GaSb Quantum Wells	Peking University
4.30 – 4.50 pm	Student talks	**Daniela Tabrea** — Study of microwave irradiated MgZnO/ZnO heterostructures	MPI for Solid State Research
5.00 – 6.00 pm		**Poster session**	
6.30 - 7.30 pm		**Dinner with the speakers**	
7.30 - 8.30 pm		**Discussion on future collaborations among PIs**	

Tuesday July 2, 2019

Time	Session	Speaker / Talk	Affiliation
9.00 – 9.30 am	Many-body theory	**Fa Wang** — Magnetic interactions and possible quantum paraelectricity in spin liquid candidate $H_3LiIr_2O_6$	Peking University
9.30 – 10.00 am	Many-body theory	**Maria Daghofer** — Interplay of spin-orbit coupling, correlations and topology in t_{24} electrons	University of Stuttgart
10.00 – 10.30 am	Many-body theory	**Junren Shi** — Berry phase in the composite Fermi liquid	Peking University
10.30 – 11.00 am		Coffee Break	
11.00 – 11.30 am	Many-body theory	**Walter Metzner** — Competition between magnetism and superconductivity in the Hubbard model and in the cuprates	MPI for Solid State Research
11.30 – 12.00 am	Many-body theory	**Ryuichi Shindou** — Theories of unconventional transport scaling in disordered Weyl semimetals and possible 3-d topological magnetic crystalline insulators in graphite under high magnetic field	Peking University
12.00 – 1.00 pm		Lunch Break	
1.00 – 1.30 pm	Non-equilibrium phenomena	**Nanlin Wang** — Ultrabroadband photosensitivity and photoinduced hidden CDW state in $1T\text{-}TaS_2$	Peking University
1.30 – 2.00 pm	Non-equilibrium phenomena	**James McIver** — Femtosecond science on-chip: Capturing light-induced anomalous Hall currents in graphene	MPI for the Structure and Dynamics of Matter
2.00 – 2.30 pm	Non-equilibrium phenomena	**Sebastian Loth** — Ultrafast dynamics of charge density waves studied with single-site resolution	University of Stuttgart
2.30 – 3.00 pm		Coffee Break	
3.00 – 3.20 pm	Student talks	**Junchao Ma** — Berry Curvature Enhanced Nonlinear Photogalvanic Response of Type-II Weyl Cone	Peking University
3.20 – 3.40 pm	Student talks	**Qingyu He** — STM tip induced phase transition in an excitonic insulator	MPI for Solid State Research
3.40 – 4.00 pm	Student talks	**Sijie Zhang** — Light-induced new collective modes and quasi-particle excitations in $La_{2-x}Ba_xCuO_4$	Peking University
4.00 – 4.20 pm	Student talks	**Lukas Schwarz** — Theory of Higgs spectroscopy for superconductors in nonequilibrium	MPI for Solid State Research
4.30 – 6.30 pm		**Poster session**	
6.30 - 7.30 pm		**BBQ in the Park**	
7.30 - 9.30 pm		**Poster session**	

Wednesday July 3, 2019

Time	Session	Speaker / Talk	Affiliation
9.00 – 9.30 am	Low-dimensional materials	**Yingying Peng** — Revealing phonon and charge order interactions in cuprate superconductor	Peking University
9.30 – 10.00 am	Low-dimensional materials	**Bernhard Keimer** — Resonant inelastic x-ray scattering from 4d metal compounds	MPI for Solid State Research
10.00 – 10.30 am	Low-dimensional materials	**Yuan Li** — Distinct fingerprints of charge density waves and electronic standing waves in $ZrTe_3$	Peking University
10.30 – 11.00 am		Coffee Break	
11.00 – 11.30 am	Low-dimensional materials	**Klaus Kern** — t.b.a.	MPI for Solid State Research
11.30 – 12.00 am	Low-dimensional materials	**Qian Niu** — Floquet-Bloch crystal as a meta space time	University of Texas Austin
12.00 – 12.30 pm	Low-dimensional materials	**Eva Benckiser** — Spin and orbital reconstructions in oxide multilayers	MPI for Solid State Research
12.30 – 1.30 pm		Lunch Break	
1.30 – 2.00 pm	Topology & spin liquids	**Xiong-Jun Liu** — Emergent topology and symmetry breaking order in quench dynamics of topological matter	Peking University
2.00 – 2.30 pm	Topology & spin liquids	**Christian Carbogno** — Quantum Materials: Obtaining Insights by Combining High-Throughput First-principles and Machine-Learning Approaches	Fritz-Haber-Institut
2.30 – 3.00 pm	Topology & spin liquids	**Hidenori Takagi** — Exotic spin-orbital entangled phases on honeycomb lattice	MPI for Solid State Research
3.00 – 3.30 pm		Coffee Break	
3.30 – 4.00 pm	Topology & spin liquids	**Roderich Moessner** — Dynamics in unconventional magnets	MPI for the Physics of Complex Systems
4.00 – 4.30 pm	Topology & spin liquids	**Yan Zhang** — Direct measurement of the electronic nematic susceptibility in $FeSe_{1-x}S_x$ superconductors	Peking University
4.30 – 4.40 pm	Topology & spin liquids	**Hidenori Takagi** — Closing remarks	MPI for Solid State Research

Optional tour of the MPI
either before 9.00 or during one
of the poster sessions