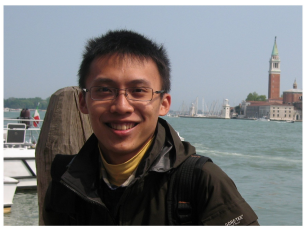
Yi-Ping **Huang**

Postdoc fellow · Theoretical condensed matter physics

Max Planck Institute for the Physics of Complex Systems, Nöthnitzer Straße 38, D-01187 Dresden, Germany

(<++>) <++>-<++> | yihu@pks.mpg.de | yipinghuang.github.io



Research Interests

I am interested in the theoretical condensed matter physics with emergent quantum phenomena in/out of equilibrium. Emergent quantum phenomena appear mostly in strongly correlated systems including frustrated quantum magnetism, correlated electrons, and ultracold atoms. I enjoy exploring universal understanding of in/out of equilibrium physics for different quantum many-body systems such as topological phases protected/enriched by symmetries, disorder free localization and dynamical quantum phase transitions.

Education

University of Colorado Boulder — *Boulder, Colorado, USA*

Doctor of Philosophy in Physics — *2012 - 2017*

- Dissertation: Symmetries and Topological order: realizations and signals in correlated strong spin-orbit coupled materials
- Advisor: Professor Michael Hermele

University of Colorado Boulder — *Boulder, Colorado, USA*

Master of Science in Physics — *2010 - 2012*

- Advisor: Professor Michael Hermele

National Tsing-Hua University — *Hsinchu, Taiwan*

Bachelor of Science in Physics — *2004 - 2008*

- Project: Quantum phase diagrams of fermionic dipolar gases in a planar array of one-dimensional tubes
- Advisor: Professor Daw-Wei Wang

Position Held

Max Planck Institute for the Physics of Complex Systems — *Dresden, Germany*

Postdoctoral Associate — *Aug. 2017 - present*

- Advisor: Prof. Dr. Roderich Moessner and Dr. Markus Heyl

Publications

2018 — **"Dynamical quantum phase transitions in $U(1)$ quantum link models"**
, **Yi-Ping Huang** Debasish Banerjee and Markus Heyl — *arXiv:1808.07874*

2018 — **"Tunneling-induced restoration of classical degeneracy in quantum kagome ice"**
, Kai-Hsin Wu, **Yi-Ping Huang** and Ying-Jer Kao — *arXiv:1806.08145*

2017 — **"Building crystalline topological phases from lower-dimensional states (Editor's suggestion)"**
, Sheng-Jie Huang, Hao Song, **Yi-Ping Huang** and Michael Hermele — *Phys. Rev. B. **95**, 075130*

2017 — **"Theory of quantum Kagome ice and vison zero modes"**
, **Yi-Ping Huang** and Michael Hermele — *Phys. Rev. B. **95**, 075130*

2015 — **"High-energy electronic excitations in Sr_2IrO_4 observed by Raman scattering"**
, Jhih-An Yang, **Yi-Ping Huang**, Michael Hermele, Tongfei Qi, Gang Cao and Dmitry Reznik — *Phys. Rev. B. **91**, 195140*

2014 — **"Quantum Spin Ices and Topological Phases from Dipolar-Octupolar Doublets on the Pyrochlore Lattice"**
, **Yi-Ping Huang**, Gang Chen and Michael Hermele — *Phys. Rev. Lett. **112**, 167203*

2009 — **"Quantum phase diagrams of fermionic dipolar gases in a planar array of one-dimensional tubes"**
, **Yi-Ping Huang** and Daw-Wei Wang — *Phys. Rev. A. **80**, 053610*

Conferences & scientific visits

2018	**The Paul Scherrer Institute** , Visiting condensed matter theory group	*Villigen Switzerland*
2018	**Cargé se international workshop** , Topological phases in condensed matter and cold atom systems	*Institut Etude Scientifique Cargèse, France*
2018	**Visiting SISSA for three weeks** , Summer school for condensed matter 2018 and discussion	*Trieste, Italy*
2018	**International workshop at Max Planck Institute for the Physics of Complex Systems** , Frustration, Orbital Fluctuations, and Topology in Kondo Lattices and their Relatives	*Dresden, Germany*
2018	**669. WE-Heraeus-Seminar at Physikzentrum Bad Honnef**, Quantum Gases and Quantum Coherence	*Bonn, Germany*
2017	**Yukawa Institute for Theoretical Physics**, Novel Quantum States in Condensed Matter 2017	*Kyoto, Japan*
2017	**International workshop at Max Planck Institute for the Physics of Complex Systems**, Quantum Sensing with Quantum Correlated Systems	*Dresden, Germany*
2017	**Max Planck Institute for the Physics of Complex Systems**, Korrelationstage 2017	*Dresden, Germany*
2017	**Kavli institute for theoretical physics**, Order, Fluctuations, and Strong Correlations: New Platforms and Developments	*Santa Barbara, USA*
2017	**Gordon research conference**, Topological and Correlated Matter: From Fundamentals to New Discoveries	*Hong-Kong, PRC*
2017	**Aspen winter conference**, Quantum Dynamics: From Models to Materials	*Aspen, USA*
2015	**The Center for Emergent Materials**, Spin-orbit coupling and magnetism in correlated transition metal oxides workshop	*Columbus, USA*
2009	**International centre for theoretical physics**, Research frontiers in ultracold atoms	*Trieste, Italy*
2010-now	**March meetings and DFG meetings** ,	*USA and Germany*

Invited Talks

2019	**The Annual meeting of the Physics Society of Taiwan** , Dynamical quantum phase transitions in $U(1)$ quantum link models	*Hsinchu, Taiwan*
2018	**Condensed matter seminar at The Paul Scherrer Institute**, From quantum spin ice to quantum Kagome ice	*Villigen Switzerland*
2018	**MPI-PKS: Frustration, Orbital Fluctuations, and Topology in Kondo Lattices and their Relatives**, Dynamical quantum phase transitions in $U(1)$ quantum link models	*Dresden, Germany*
2018	**National center of theoretical physics, National Taiwan University, National Chiao Tung University** , Dynamical quantum phase transition in 1D quantum link model	*Hsinchu and Taipei, Taiwan*
2018	**National Taiwan Normal University**, Symmetry enriched topological order and vison zero modes in the XYZh model on the Kagome lattice	*Taipei, Taiwan*
2015	**RIKEN**, Dipolar-octupolar doublets and realization of quantum spin ice	*RIKEN, Japan*

Skills

Theoretical physics	• Physics of correlated materials • Ultracold atoms • Effective theory • Group theory • Field theory • Gauge theory • Bosonization
Numerical methods	• TEBD • Exact diagonalization
Programming	• C/C++(boost graph library, intel Math Kernel Library, HDF5) • Python • Mathematica
Other Tools	• Git • GNU make • Inkscape • Basic parallel computation
Operation System	• Windows • Linux(Ubuntu and RHEL)
Languages	• Mandarin(native speaker) • English(fluent, TOEFL iBT: 103)

Honors & Awards

2015-2017	**Taiwan Ministry of Education scholarship**, 16000USD/year for 2 years
2009	**Outstanding poster presentation**, Annual Meeting of the Physics Society of Taiwan

Reviewing Activities

• Nature Physics • Physical Review B • Physical Review A

References

Prof. Michael Hermele University of Colorado Boulder Condensed matter theory
Email: michael.hermele@colorado.edu

Prof. Gang Chen Fudan University Condensed matter theory
Email: chggst@gmail.com

Dr. Markus Heyl Max Planck Institute for the Physics of Complex Systems Condensed matter theory
Email: heyl@pks.mpg.de

Prof. Ying-Jer Kao National Taiwan University Condensed matter theory
Email: yjkao@phys.ntu.edu.tw