

Curriculum Vitae of Dr. Guo-Yi Zhu (朱国毅)

BASIC INFORMATION

Name: Guo-Yi Zhu 朱国毅

Gender: Male **Date of Birth:** July 14, 1991 **Nationality:** China

Mobile phone: +86 13121624897 / +49 1627090857

Major: Theoretical Condensed Matter Physics

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Address: Institute for Theoretical Physics, University of Cologne, Germany



EDUCATION

Tsinghua University, Beijing, China

Ph.D. in theoretical condensed matter physics, Department of Physics, Sep.2014-Jul.2019

Dissertation: Theoretical study of the topological phases and phase transitions in the two-dimensional strongly correlated quantum many-body system

Supervisor: Guang-Ming Zhang

South China University of Technology, Guangzhou, China

B.S. in applied physics, Department of Physics, School of Science, Sep.2010-Jul.2014

Thesis: Shot noise in the grating of heli-magnets

Supervisor: Rui Zhu

RESEARCH INTERESTS

Quantum matter:

- Entangled quantum many-body wavefunctions
- Interacting topological phases of matter and phase transitions
- Correlated electrons: spin liquid and unconventional superconductivity
- Out-of-equilibrium quantum many-body dynamics

RESEARCH EXPERIENCE

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

Postdoctoral fellow, Sep.2019 – Aug.2021

Institute for Theoretical Physics, University of Cologne, Cologne, Germany

Postdoctoral fellow, Sep.2021 –

TEACHING ASSISTANT EXPERIENCE

Feynman lectures on physics III (quantum mechanics), Tsinghua University Sep.2014

Statistical Mechanics, Tsinghua University Mar.2015

HONOURS & AWARDS & SCHOLARSHIPS

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| 2019 | Yu-Hsun Woo prize for excellence in graduate study of physics, Tsinghua University |
| 2018 | Scholarship by the Department of Physics in Tsinghua University |
| 2018 | Prize for outstanding speakers in the annual Forum for PhD students organized by the Department of Physics, Tsinghua University |
| 2017 | Prize for outstanding speakers in the Joint Forum for PhD students organized by the Department of Physics from Tsinghua University, Peking University, Nanjing University, Fudan University and the Chinese University of Science and Technology |
| 2017 | National Scholarship for PhD Students |
| 2016 | Prize for outstanding speakers in the annual Forum for PhD students organized by the Department of Physics, Tsinghua University |
| 2016 | Guanghua Scholarship for Doctoral Students, Tsinghua University |
| 2014 | Outstanding graduate student in the school of Science, South China University of Technology |
| 2013 | Successful-participants award for Interdisciplinary Contest in Modeling |
| 2013. | National Scholarship for Undergraduate Students (2012-2013) |
| 2012. | National Scholarship for Undergraduate Students (2011-2012) |

PUBLICATIONS & PREPRINTS

1. **G.Y. Zhu**, Nathanan Tantivasadakarn, Ashvin Vishwanath, Simon Trebst, Ruben Verresen, Nishimori's cat: stable long-range entanglement from finite-depth unitaries and weak measurements, [arXiv:2208.11136 \(2022\)](https://arxiv.org/abs/2208.11136).
2. **G.Y. Zhu**, Ji-Yao Chen, Peng Ye, Simon Trebst, Topological fracton quantum phase transitions by tuning exact tensor network states, [arXiv:2203.00015 \(2022\)](https://arxiv.org/abs/2203.00015).
3. **G. Y. Zhu** and Markus Heyl, Subdiffusive dynamics and critical quantum correlations in a disorder-free marginal localized Kitaev honeycomb model, [Phys. Rev. Research. Lett. 3, L032069 \(2021\)](https://doi.org/10.1103/PhysRevResearch.3.L032069).
4. P.I.Karpov, **G.Y.Zhu**, M.P.Heller, M.Heyl, Spatiotemporal dynamics of particle collisions in quantum spin chains, [Phys. Rev. Research. Lett. 4, L032001 \(2022\)](https://doi.org/10.1103/PhysRevResearch.4.L032001).
5. **G. Y. Zhu** and G. M. Zhang, Gapless Coulomb State Emerging from a Self-Dual Topological Tensor-Network State, [Phys. Rev. Lett. 122,176401\(2019\)](https://doi.org/10.1103/PhysRevLett.122.176401).
6. **G. Y. Zhu**, Tao Xiang and G. M. Zhang, Inter-valley spiral order in the Mott insulating state of a heterostructure of trilayer graphene-boron nitride, [Science Bulletin 63,1087 \(2018\)](https://doi.org/10.1126/science.1258771).
7. **G. Y. Zhu**, Tao Xiang and G. M. Zhang, Spin-valley antiferromagnetism and topological superconductivity in the trilayer graphene Moire super-lattice, [arXiv:1806.07535 \(2018\)](https://arxiv.org/abs/1806.07535).
8. Zi-Qi Wang, **G. Y. Zhu** and G. M. Zhang, Decoding quantum criticality from fermionic/parafermionic topological states, [Phys. Rev. B 98, 155139 \(2018\)](https://doi.org/10.1103/PhysRevB.98.155139).
9. **G. Y. Zhu**, G. M. Zhang, Topological phase transition from nodal to nodeless d-wave superconductivity in electron doped Cuprate superconductors , [Europhys. Lett. 118, 37004 \(2017\)](https://doi.org/10.1139/E17-03-004).
10. **G. Y. Zhu**, Ziqiang Wang, G. M. Zhang, 2D topological superconducting phases emerged from d-wave superconductors in proximity to antiferromagnets , [Europhys. Lett. 117, 67007 \(2017\)](https://doi.org/10.1139/E17-03-007).
11. **G. Y. Zhu**, G. M. Zhang, Plaquette-centered rotation symmetry and octet-nodal superconductivity in KFe2As2, [arXiv: 1707.04009 \(2017\)](https://arxiv.org/abs/1707.04009).
12. **G. Y. Zhu**, Fu-Chun Zhang, G. M. Zhang, Proximity induced superconductivity in monolayer CuO2 on Cuprate substrate , [Phys. Rev. B 94, 174501 \(2016\)](https://doi.org/10.1103/PhysRevB.94.174501).
13. Wen-Jia Rao, **G. Y. Zhu**, G. M. Zhang, SU(3) quantum critical model emerging from a spin-1 topological phases, [Phys. Rev. B 93, 165135 \(2016\)](https://doi.org/10.1103/PhysRevB.93.165135).
14. Rui Zhu, **G. Y. Zhu**, Conductance and shot noise in the helimagnet tunnel junction, [Physics Letter A 379, 2466 \(2015\)](https://doi.org/10.1063/1.492466).
15. 朱国毅, [二维强关联量子多体系统的拓扑物相及相变的理论研究](#), 清华大学博士学位论文 (2019) (pdf available upon request).
16. 张广铭, 朱国毅, 凝聚态物理学的新篇章——超越朗道范式的拓扑量子物态, [物理, 50\(9\): 569 \(2021\)](https://doi.org/10.1088/0256-3078/50/9/569).
17. 朱国毅, 王瑞蕊, 张广铭, Majorana 费米子与拓扑量子计算, [物理, 46\(3\): 154 \(2017\)](https://doi.org/10.1088/0256-3078/46/3/154).