Meng, Zi Yang

Academic qualifications

University of Science and Technology of China	B.Sc. in Physics	2005
Universität Stuttgart, Germany	M.Sc. in Physics	2007
Universität Stuttgart, Germany	Ph.D. in Physics	2011

Previous academic positions

Professor	Institute of Physics, Chinese Academy of Sciences	2018.08 – 2019.02
Associate Professor	Institute of Physics, Chinese Academy of Sciences	2014.08 – 2018.07
Postdoctoral Fellow	University of Toronto	2013.08 – 2014.07
Postdoctoral Research Associate	Louisiana State University	2011.09 – 2013.07

Present academic position

Professor	Department of Physics, The University of Hong Kong	2023.10 -
Associate Professor	Department of Physics, The University of Hong Kong	2019.03 -2023.09

Research Interests & Expertise

Highly entangled quantum models and materials: quantum phase transitions, quantum magnetism, non-Fermi-liquid, quantum entanglement and 2D quantum moiré materials, programmable quantum simulators.

Computational condensed matter physics: large-scale quantum Monte Carlo simulations, self-learning quantum Monte Carlo algorithms, tensor-network and neural-network, GPU & AI4Science and high-performance computation.

Honours and Awards

1). Course Director of 2025 Croucher Advanced Study Institute on Fractional Chern Insulators.

2). 2024 IOP Publishing Top Cited Paper Award for China.

3). Since 2022, Editorial Board Member of Reports on Progress in Physics in IOPSCIENCE.

4). 2020/21 Tianhe Star Award for "outstanding accomplishments and promotion of computational oriented research on the Tianhe supercomputers of China".

5). 2018 Highly Cited Research Article Award by Chinese Physics Society.

6). 2016 Mercator Fellow of the DFG research unit FOR1807 "*Advanced Computational Methods for Strongly Correlated Quantum Systems*".

7). Citation ~ 9000 (google scholar), h-index 52, ~170 publications.

8). Referee for grants applications of Dutch Research Council, National Research Foundation of Singapore; Referee for promotion at Nanyang Technological University, Singapore; graduate 12 PhD students and 6 postdoctoral fellows.

Representative publications in recent years

1). *Angle-Tuned Gross-Neveu Quantum Criticality in Twisted Bilayer Graphene: A Quantum Monte Carlo Study,* Cheng Huang, Nikolaos Parthenios, Maksim Ulybyshev, Xu Zhang, Fakher F. Assaad, Laura Classen*, and **Zi Yang Meng*(Corresponding author)**, Nature Communications 16, 7176 (2025)

2). *Evolution of entanglement entropy at SU(N) deconfined quantum critical points*, Menghan

Song, Jiarui Zhao, Meng Cheng, Cenke Xu, Michael M. Scherer, Lukas Janssen, **Zi Yang Meng*,** Science Advances 11, adr0634 (2025)
3). *Spectral evidence for Dirac spinons in a kagome lattice antiferromagnet*, Zhenyuan Zeng, Chengkang Zhou, Honglin Zhou, Lankun Han, Runze Chi, Kuo Li, Maiko Kofu, Kenji Nakajima, Yuan Wei, Wenliang Zhang, D. G. Mazzone, **Zi Yang Meng***, Shiliang Li*, Nature Physics 20, 1097 (2024)
4). *From Fractional Quantum Anomalous Hall Smectics to Polar Smectic Metals: Nontrivial Interplay Between Electronic Liquid Crystal Order and Topological Order in Correlated Topological Flat Bands,* Hongyu Lu, Han-Qing Wu, Bin-Bin Chen*, Kai Sun*, **Zi Yang Meng***, Rep. Prog. Phys. 87 108003 (2024)
5). *Phases of (2+1)D SO(5) non-linear sigma model with a topological term on a sphere: multicritical point and disorder phase,* Bin-Bin Chen, Xu Zhang, Yuxuan Wang, Kai Sun, **Zi Yang Meng*,** Phys. Rev. Lett. 132,246503 (2024)

Five representative publications beyond recent five-year period

1). *Correlation-induced insulating topological phases at charge neutrality in twisted bilayer graphene,* Yuan Da Liao, Jian Kang, Clara N. Breiø, Xiao Yan Xu, Han-Qing Wu, Brian M. Andersen*, Rafael M. Fernandes*, Zi Yang Meng*, Phys. Rev. X 11, 011014 (2021)
2). *Monte Carlo Study of Compact Quantum Electrodynamics with Fermionic Matter: the Parent State of Quantum Phases,* Xiao Yan Xu, Yang Qi, Long Zhang, Fakher F. Assaad, Cenke Xu, **Zi Yang Meng*,** Phys. Rev. X 9, 021022 (2019)
3). *Itinerant Quantum Critical Point with Fermion Pockets and Hot Spots*, Zi Hong Liu, Gaopei Pan, Xiao Yan Xu, Kai Sun, **Zi Yang Meng***, Proc. Natl. Acad. Sci. U.S.A. 116 (34), 16760 (2019)
4). *Duality between the deconfined quantum-critical point and the bosonic topological transition*, Yan Qi Qin, Yuan-Yao He, Yi-Zhuang You, Zhong-Yi Lu, Arnab Sen, Anders W. Sandvik, Cenke Xu, **Zi Yang Meng*,** Phys. Rev. X 7, 031052 (2017)
5). *Nearly deconfined spinon excitationns in the square-lattice spin-1/2 Heisenberg antiferromagnet,* Hui Shao*, Yan Qi Qin, Sylvain Capponi, Stefano Chesi, **Zi Yang Meng*,** Anders W. Sandvik*, Phys. Rev. X 7, 041072 (2017)

Research Grants

1). Course Director of Croucher Advanced Study Institute 2025-2026
Project title: Fractional Chern Insulator: Theory, Numerics and Experiment
Funding year: 2025-2026 Amount: 600,000 HKD
2). Project Coordinator (PC) of Research Grants Council (RGC) of Hong Kong Collaborative Research Fund (CRF) Scheme
Project No.: C7037-22GF
Project title: Many-body paradigm in quantum moiré material research
Funding year: 2023 – 2026 (on-going) Amount: 5,964,800 HKD
3). Principle Investigator (PI) of French National Research Agency (Agence Nationale de la Recherche) and the Research Grants Council (RGC) of Hong Kong Joint Research Scheme
Project No.: A_HKU703/22
Project title: Automate: Advanced Numerical Methods for Highly Entangled Quantum Matter
Funding year: 2023 – 2027 (on-going) Amount: 3,000,000 HKD
4). PI of Research Grants Council (RGC) of Hong Kong General Research Fund Scheme
Project No.: 17301725
Project title: Quantum Many-Body Investigations of Fractional Chern Insulators,
Funding year: 2026 - 2028 (to be started) Amount: 890,587 HKD