Zhian Jia [1]

Personal Data [Orcid] [Google scholar]

Address:	Centre for Quantum Technologies, NUS
email:	giannjia@foxmail.com
Research Blog:	The lost worldline
Homepage:	https://polyidoit.github.io/jia/
ArXiv page:	https://arxiv.org/a/jia_z_2.html
Physics.StackExchange:	https://physics.stackexchange.com/users/149857/zhian-jia
Zhihu:	https://www.zhihu.com/people/polyidiot

Academic Experience

Sep 2021 - present	Centre for Quantum Technologies, **National University of Singapore**, Singapore Supervisor: Dagomir Kaszlikowski Research Fellow
Sep 2015 - Jun 2021	CAS Key Laboratory of Quantum Information, **University of Science and Technology of China**, Hefei, China Supervisor: Guang-Can Guo, Yu-Chun Wu PhD degree in Physics Thesis: Classification, criteria and properties of quantum correlations and their applications in quantum many-body systems
Nov 2018 - Dec 2019	Microsoft Station Q, Department of Mathematics, **University of California, Santa Barbara**, California, United States Supervisor: Zhenghan Wang Visiting scholar program
Sep 2017 - Aug 2018	Yau Mathematical Sciences Center, Department of Mathematical Sciences, **Tsinghua University**, Beijing, China Supervisor: Liang Kong Visiting Ph.D.
Sep 2011 - Jun 2015	Institute of Super-microstructure and Ultrafast Process in Advanced Materials, School of Physics and Electronics, **Central South University**, Changsha, China B.S. in Applied Physics Thesis: Impurity effect of vacancy in two dimensional crystals and related quantum Hall effect

[1] Chinese (Mandarin): Zhian Jia or Zhi-An Jia; Also known as: Zhih-Ahn Jia.

Selected Awards

2017 Guorui scholarship for graduate students
2016 National scholarship for graduate students
2016 The Best Presenters' Prize
Talk title: monogamy as a fundamental quantum phenomenon
The third PFUNT(Physics Five Universities,the National Top) PhD Student Forum
2016 The Third Prize of Talk
Talk title: graph theoretic approach to quantum contextuality
The sixth graduate student academic annual meeting of USTC
2015 The Outstanding Project Prize
project title: First Principle Method of Single Layer Graphene-like Material and Its Functional Devices Design
College students' innovative and entrepreneurial project
2014 College scholarships of Physics and Electronics, Central South University
2010 The Second Prize of The 27th national physics olympiad, 2010.

Publications and preprints [arXiv][Google scholar]

- **Z. A. Jia**, Dagomir Kaszlikowski, Gapped boundary theory of Hopf algebraic quantum double model for 2d topological orders, to be published
- Lu Wei, **Z. A. Jia**, Dagomir Kaszlikowski, Quantum geometric invariance for higher dimensional quantum systems, to be published
- Huan Cao, Ning-ning Wang, **Z. A. Jia**, Chao Zhang, Yu Guo, Bi-Heng Liu, Yun-Feng Huang, Chuan-Feng Li, Guang-Can Guo, Experimental demonstration of indefinite causal order induced quantum heat extraction, arXiv:2101.07979
- **Z. A. Jia**, Lu We, Yu-Chun Wu, Guang-Can Guo, Quantum Advantages of Communication Complexity from Bell Nonlocality, Entropy 23 (6), 744 (2021)
- **Z. A. Jia**, Rui Zhai, Shang Yu, Yu-Chun Wu, and Guang-Can Guo, Hierarchy of Genuine Multipartite Quantum Correlations, Quantum Inf Process 19, 419 (2020)
- Yu Meng, Shang Yu, **Z. A. Jia**, Yi-Tao Wang, Zhi-Jin Ke, Wei Liu, Zhi-Peng Li, Yuan-Ze Yang, Hang Wang, Yu-Chun Wu, Jian-Shun Tang, Chuan-Feng Li, Guang-Can Guo, Environment-induced sudden change of coherence in quantum systems, Phys. Rev. A 102, 042415 (2020)
- **Z. A. Jia**, Lu We, Yu-Chun Wu, Guang-Can Guo, Guo-Ping Guo, Entanglement Area Law for Shallow and Deep Quantum Neural Network States, New J. Phys. 22 053022 (2020)
- **Z. A. Jia**, Biao Yi, Rui Zhai, Yu-Chun Wu, Guang-Can Guo and Guo-Ping Guo, Quantum Neural Network States: A Brief Review of Methods and Applications, Adv. Quantum Technol.2019, 1800077
- **Z. A. Jia**, Yuan-Hang Zhang, Yu-Chun Wu, Liang Kong, Guang-Can Guo, and Guo-Ping Guo, Efficient Machine Learning Representations of Surface Code with Boundaries, Defects, Domain Walls and Twists, Phys. Rev. A 99, 012307 (2019)
- Yuan-Hang Zhang, **Z. A. Jia**, Yu-Chun Wu, and Guang-Can Guo, An Efficient Algorithmic Way to Construct Boltzmann Machine Representations for Arbitrary Stabilizer Code, arXiv:1809.08631
- **Z. A. Jia**, Rui Zhai, Yu-Chun Wu, and Guang-Can Guo, Entropic No-Disturbance as a Physical Principle, Phys. Rev. A 97, 052128 (2018)
- Shang Yu, Chang-Jiang Huang, Jian-Shun Tang, **Z. A. Jia**, Yi-Tao Wang, Zhi-Jin Ke, Wei Liu, Zong-Quan Zhou, Ze-Di Cheng, Jin-Shi Xu, Yu-Chun Wu, Yuan-Yuan Zhao, Guo-Yong Xiang, Chuan-Feng Li, Guang-Can Guo, Gael Sentís, and Ramon Muñoz-Tapia, Experi-

mentally Detecting a Quantum Change Point via Bayesian Inference, Phys. Rev. A 98, 040301(R) (2018)

- Bai-Chu Yu, **Z. A. Jia**, Yu-Chun Wu, and Guang-Can Guo, Geometric Local Hidden State Model for Some Two-qubit States, Phys. Rev. A 98, 052345 (2018)
- Bai-Chu Yu, **Z. A. Jia**, Yu-Chun Wu, and Guang-Can Guo, Geometric Steering Criterion for Two-qubit States, Phys. Rev. A 97, 012130 (2018)
- **Z. A. Jia**, Gao-Di Cai, Yu-Chun Wu, Guang-Can Guo, and Adán Cabello, The Exclusivity Principle Determines the Correlation Monogamy, arXiv:1707.03250
- **Z. A. Jia**, Yu-Chun Wu, and Guang-Can Guo, Characterizing nonlocal correlations via universal uncertainty relations, Phys. Rev. A 96, 032122(2017)
- **Z. A. Jia**, Yu-Chun Wu, and Guang-Can Guo, Monogamy Relation in No-disturbance Theories, Phys. Rev. A 94, 012111(2016)
- SHAO Yan, OUYANG Fang-Ping, PENG Sheng-Lin, LIU Qi, **JIA Z. A.**, ZOU Hui, First-Principles Calculations of Electronic Properties of Defective Armchair MoS_2 Nanoribbons, [J]. Acta Phys. -Chim. Sin., 2015,31 (11): 2083-2090.

Lecture notes

- **Z. A. Jia**, Lecture notes on string theory
- **Z. A. Jia**, Lecture notes on quantum information theory

Computer Skills

Programming Languages:	Python, C, C++, Matlab, LaTeX
Operating System:	Windows, macOS, Ubuntu

SELECTED ATTENDED CONFERENCES

Nov 23 - 25, 2020	Fields, Gravity and Information Fudan University, Shanghai, China
Dec 16 - 20, 2019	Topological quantum computing (TQC2019) Southern University of Science and Technology, Peng Cheng Laboratory Institute for quantum science and engineering, Shenzhen, China
Aug 13 - 17, 2018	Summer school on AdS/CFT Center for High Energy Physics, Peking University, Beijing, China
Jul 16 - 20, 2018	Tsinghua Summer School on Quantum Physics (TSSQP) State Key Laboratory of Low-Dimensional Quantum Physics, Tsinghua University, Beijing, China
Jul 4 - 6, 2018	The First International Conference on Machine Learning and Physics Institute for Advanced Study, Tsinghua University, Beijing, China
May 4 - 6, 2018	Conference: Topological Matter and Topological Computation Kavli Institute for Theoretical Sciences, University of Chinese Academy of Sciences, Beijing, China
Mar 19 - 23, 2018	Quantum Machine Learning and Biomimetic Quantum Technologies University of the Basque Country, Leioa, Spain
Jun 20 - 30, 2017	Workshop: Tensor categories and topological quantum matter Fudan University, Shanghai, China
Jun 4 - 5, 2017	Workshop: Quantum Contextuality in Quantum Mechanics and Beyond Talk title: Exclusivity principle determines the correlation monogamy Prague, Czech Republic
Jan 23 - 26, 2017	Conference on 90 Years of Quantum Mechanics Nanyang technological university, Singapore
Dec 15 - 17, 2016	The Third PFUNT(Physics Five Universities,the National Top) PhD Student Forum Talk title: monogamy as a fundamental quantum phenomenon Tsinghua university, Beijing, China
Nov 26, 2016	The Sixth Graduate Student Academic Annual Meeting of USTC Talk title: graph theoretical approach to quantum contextuality University of Science and Technology of China, Hefei, China
Aug 6 - 8, 2016	The 17th National Conference on Quantum Optics Talk title: monogamy relations of different kinds of quantum correlations Lanzhou university, Lanzhou, China
Aug 1 - 6, 2016	Strings 2016 conference Tsinghua University, Beijing, China
Jun 16- Jul 16, 2016	Summer School on Supersymmetry and Fiber bundle University of Chinese Academy of Sciences, Beijing, China
May 23 - 24, 2015	The First Conference of The Second Revolution of Quantum Mechanics University of Science and Technology of China, Hefei, China