上海交通大學
SHANGHAI JIAO TONG UNIVERSITY

Ruocheng Wang
Tel:+86 13851362201
E-mail: Ignite@sjtu.edu.cn

EDUCATION

Shanghai Jiao Tong University Physics (Zhiyuan Honors program, top 10% in SJTU) Sept. 2021-present

CoursesStudied: Mathematical Analysis, Advanced Algebra, Methods of mathematical physics, Classical Mechanics, Quantum Mechanics II (A+), Thermodynamics and Statistical Physics (99), Electrodynamics (98), Introduction to Computational Physics (99),Introduction to Nanotechnology (by Prof.Nai-ChangYeh at Caltech), etc.

Institute of Computing Technology, **Chinese Academy of Sciences** Quantum Information (Research Internship) Aug. 2023

Harford College, University of Oxford Advanced English Language and Sritish Culture Programme Aug. 2024

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RESEARCH EXPERIENCE

- **Quantum langevin equations of the periodic driven system and frequency locking effect of the system with external drive** Sept.2022-Oct.2023

  Advisor: Prof. Carlos Navarrete-Benlloch, Associate Professor, School of Physics and Astronomy, SJTU

  - Obtained asymptote solutions and performed stability analysis under the classical limits of the feedback tuned VdP model and DOPO model.
  - Simulated and discussed How to qualitatively judge the frequency locking effect by phase analysis of the complex plane

- **Design of constrained quantum variational circuits and application to solving complex problem** Sept.2023-Present, supported by the Zhiyuan Future Scholars Program

  Advisor: Prof. Yan Junchi, Full Professor (tenured), IET Fellow, Department of Computer Science & Engineering, SJTU

  - Discuss in detail the Hamming Weight (HW) Preserving ansatz under full dimension of dynamic Lie algebras under full join and bow tie conditions, and then give the guiding parameter Settings
  - Manage to combine the HW Preserving ansatz and topological-aware parity check on physical qubits to enforce a hard constraint for Quadratic Assignment Problem (QAP)
  - Demonstrate its capability on other CO problems e.g. Travelling Salesman Problem (TSP) when it is converted to the QAP form
  - Code with fewer anyons in topological quantum computing to eliminate the redundant state space

- **Non-equilibrium and self-organization phenomena in hot spot ignition models** Sep. 2023-Feb.2024

  Advisor: Prof. Dong Wu, Tenured Professor at SJTU, Prof. Jie Zhang, Academician of the Chinese Academy of Sciences

  - Study a non-equilibrium model and extend this model to both isobaric and isochoric conditions, which differ in th e hot-spot density and expansion speed.
  - Observe the natural phenomenon of self-organization in the bifurcated evolution of ion and electron temperatures is in both cases, that ion temperature heating outstands in the ignition.

PUBLICATIONS

- Yan, G., Ran, M., **Wang, R.**, Pan, K., & Yan, J. Rethinking Parity Check Enhanced Symmetry-Preserving Ansatz. In The Thirty-eighth Annual Conference on Neural Information Processing Systems.
- Yan, G., Wu, W., Yuheng, C., Pan, K., Lu, X., Zixiang, Z., Yuhan, W., **Ruocheng, W**. & Yan, J. (2024). Quantum circuit synthesis and compilation optimization: overview and prospects. CoRR.
- Fu, X. Y., Guo, Z. Y., Wang, Q. H., **Wang, R. C.**, Wu, D., & Zhang, J. (2024). Non-Equilibrium and Self-Organization Evolution in Hot-Spot Ignition Processes. Phys. Plasmas 31, 072710 (2024)

CONFERENCE

- National Science Review Frontiers in Physical and Information Sciences Forum — Nov.2024
- The 2nd CCF Quantum Computation Conference, CQCC 2023 — Jul.2023
- AI for Science Congress — Aug.2023
- Advanced Seminar on ICF Workshops — Jan. 2024

SELECTED HONORS & AWARDS

- First prize of the Challenge Cup special competition — 2024
- Rong Chang Science and Technology Innovation Scholarship — 2024
- National Scholarship — 2023
- A-class scholarship, SJTU — 2023
- Zhiyuan Outstanding Leader Scholarship (First prize), SJTU — 2021, 2022
- Zhiyuan Honors Scholarship , SJTU — 2019
- Bronze medal for Chinese Physics Olympiad, Chinese Physical Society — 2019
- 1st Prize for Chinese Mathematical Olympiad, Chinese Mathematical Society — 2018

ACTIVITIES AND ENGAGEMENT

- Chairman of the Student Union of Zhiyuan College
- Participant in 12-9 Concert representing Zhiyuan College
- Volunteer in welcoming 2020 SJTU graduate freshmen