

WEIGUO MA

PERSONAL INFORMATION

Data of Birth 16 Dec 1998
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GitHub <https://github.com/WeiguoMa>

RESEARCH EXPERIENCE

PROJECT	Real Noise Quantum Circuit Simulator via Matrix Product Density Operator		
PERIOD	March 2023 — May 2023		
ADVISER	Prof. Heng Fan	Institute of Physics, CAS, P.R.C.	
TITLE	Research Assistant		
<p>The current tensor network simulator has limitations in simulating quantum circuits, as it can only handle ideal scenarios or standard noise models. However, superconducting quantum computing experiments have shown that the main noise in quantum computers is complex, including crosstalk and other errors arising from physical implementations. To address this, I incorporate real quantum computer data to create noise models that more accurately represent the complexities of actual quantum devices. This approach enables me to simulate real quantum computers and allows for testing quantum circuits under more realistic conditions. Additionally, it facilitates the analysis of quantum entanglement between qubits and the classical entropy resulting from quantum noise. By leveraging real quantum computer data for noise simulation, with powerful technique – tensor network, this research contributes to a better understanding of quantum computing behavior under practical conditions and may aid in the development of strategies to mitigate noise-induced errors in quantum circuits. An article is in preparation.</p>			
PROJECT	The Influence of Flow Cutting Line on Precipitation and Crystallization of Non-pure Water in Fixed Magnetic Field		
PERIOD	February 2020 — December 2020		
ADVISER	Prof. Daqiang Gao	Lanzhou University, P.R.C.	
TITLE	Research Assistant		
<p>The project aims to analyze water precipitation after circulating in a magnetic field. Specific variables, including circulation times, water temperature, and initial chemical composition, are manipulated to study their impact on the precipitation process.</p>			
PROJECT	Single Photon Interference		
PERIOD	November 2019		
ADVISER	Prof. Noboru Sasao	Okayama University, Japan	
TITLE	Intern Student		
<p>Studied the phenomenon of single photon interference by utilizing MPPC.</p>			

PROJECT	Small Telescope Control and Automatic Star Search System	
PERIOD	March 2019 — December 2019	
ADVISER	Dr. Xunshuan Li	Lanzhou University, P.R.C.
TITLE	Research Assistant	

Introducing a high-integrity, integrated, and portable control and automatic star search system for small astronomical telescopes. This advanced system enables automatic star search, celestial body tracking, focusing, and shooting, all within a single unit. Comprising a master control microcomputer, electrical and mechanical control parts, and a mobile phone terminal program, it significantly reduces the need for additional devices during astronomical observation and photography. With the added convenience of mobile phone monitoring and control, the system lowers the threshold for engaging in astronomical pursuits, providing a comprehensive and user-friendly solution.

EDUCATION

PERIOD	September 2021 — Now	
DEGREE	Ph.D. in Condensed Matter Physics	
UNIVERSITY	Institute of Physics, Chinese Academy of Sciences	Beijing, P.R.C.
PERIOD	September 2017 — June 2021	
DEGREE	B.Sc. in Theoretical Physics	
UNIVERSITY	Lanzhou University	Lanzhou, P.R.C.

AWARDS

2021	Excellent Graduate	Lanzhou Univ.
2018, 2019, 2020	Student Pacesetter	Lanzhou Univ.
2018, 2019, 2020	First-class Scholarship for Outstanding Students	Lanzhou Univ.
2020	Outstanding Broadcaster	Lanzhou Univ. Radio Station
DEC. 2019	University Student Scholarship of CAS	UCAS
JUNE 2019	Special Prize in CUPT (Northwest Division)	Chinese Physical Society

SKILLS

Digital	PYTHON, MATLAB, LATEX, FORTRAN
Courses	Advanced Quantum Mechanism, Solid Theory, Quantum Optics
Languages	Mandarin, English

EXTRACURRICULAR ACTIVITIES

SEP. 2021 - JUNE 2022	Member, Publicity Department, University of Chinese Academy of Sciences
AUG. 2019 - JULY 2020	Deputy Class Adviser, Lanzhou University
OCT. 2017 - MAR. 2021	English Broadcaster & Technician, Lanzhou University Radio Station
OCT. 2017 - JUNE 2018	Member, Academic Department, Lanzhou University