




# Dr. Yu-Cheng QIU

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## Education

2017.06 – 2022.08	<b>The Hong Kong University of Science and Technology</b> , Hong Kong Supervisor: Prof. S. -H. Henry Tye	Ph.D in Physics
2013.09 – 2017.06	<b>Soochow University</b> , Suzhou	Bachelor in Science

## Experience

2022.09 –	<b>Tsung-Dao Lee Institute</b> , Shanghai	Postdoc
2023.07 – 2023.07	<b>Kavli IPMU</b> , Tokyo	Visiting Scholar
2022.09 – 2022.10	<b>The HKUST Jockey Club IAS</b> , Hong Kong	Visiting Scholar

## Research Interest

Particle Theory and Cosmology:	Axion   Dark matter   Dark energy
Non-perturbative Physics:	Instanton/Sphaleron   Discrete Gauge Symmetry
String Phenomenology:	dS vacua construction   Landscape and swampland

## Publication

- Gemini dark matter 2407.01099  
Andrew Cheek, **Yu-Cheng Qiu**, Liang Tan (Jul 1, 2024)
- Large CP Violation from the Minimum Seesaw Model 2406.16352  
**Yu-Cheng Qiu**, Jin-Wei Wang, Tsutomu T. Yanagida (Jun 24, 2024)
- Ultraheavy Atomic Dark Matter Freeze-Out through Rearrangement 2312.13758  
**Yu-Cheng Qiu**, Jie Sheng, Liang Tan, Chuan-Yang Xing (Dec 21, 2023)
- Can we explain cosmic birefringence without a new light field beyond Standard Model? 2310.09152  
Yuichiro Nakai, Ryo Namba, Ippei Obata, **Yu-Cheng Qiu**, Ryo Saito (Oct 16, 2023)
- Baryon number violating rate as a function of the proton-proton collision energy 2309.07410  
**Yu-Cheng Qiu**, S. -H. Henry Tye (Mar 5, 2023)
- Predictions of  $m_{ee}$  and neutrino mass from a consistent Froggatt-Nielsen model 2307.16470  
**Yu-Cheng Qiu**, Jin-Wei Wang, Tsutomu T. Yanagida (Jul 31, 2023)
- A model of the quintessence axion 2303.02852  
Sudhakantha Girmohanta, **Yu-Cheng Qiu**, Jin-Wei Wang, Tsutomu T. Yanagida (Mar 5, 2023)
- High-quality axions in a class of chiral  $U(1)$  gauge theories 2301.02345  
**Yu-Cheng Qiu**, Jin-wei Wang, Tsutomu T. Yanagida (Jan 5, 2023)
- Electroweak Axion as the Fuzzy Dark Matter  
– A Proposal for the Mixed Fuzzy and Cold Dark Matters 2211.15967  
**Yu-Cheng Qiu**, Tsutomu T. Yanagida (Nov 29, 2022)

- A Novel Solution to the Gravitino Problem 2207.03144  
Yu-Cheng Qiu, S. -H. Henry Tye (Jul 7, 2022)
- Probing The Neutrino Sector via A Statistical Approach 2110.10462  
Yu-Cheng Qiu, Hui-Yu Zhu (Oct 22, 2021)
- The Hubble Constant in the Axi-Higgs Universe 2105.01631  
Leo WH Fung, Lingfeng Li, Tao Liu, Hoang Nhan Luu, Yu-Cheng Qiu, S. -H. Henry Tye (May 4, 2021)
- Axi-Higgs cosmology 2102.11257  
Leo W.H. Fung, Lingfeng Li, Tao Liu, Hoang Nhan Luu, Yu-Cheng Qiu, S. -H. Henry Tye (Feb 22, 2021)
- Standard Model from A Supergravity Model with a Naturally Small Cosmological Constant 2010.10089  
Shing Yan Li, Yu-Cheng Qiu, S. -H. Henry Tye (Oct 20, 2020)
- Linking the Supersymmetric Standard Model to the Cosmological Constant 2006.16620  
Yu-Cheng Qiu, S. -H. Henry Tye (Jun 30, 2020)
- Role of Bloch Waves in baryon-number violating processes 1812.07181  
Yu-Cheng Qiu, S. -H. Henry Tye (Dec 18, 2018)

## Award

- 2022 Postdoctoral International Exchange Program Introduction Project 2022 TDLI
- Best TA Honorable Mention 2018-2019 HKUST
- Outstanding Graduates 2017 Soochow U.
- Hui-Chun Chin and Tsung-Dao Lee Chinese Undergraduate Research Endowment (CURE) 2015 Soochow U.

## Conference/Public Presentation

- "Ultraheavy Atomic Dark Matter Freeze-Out through Rearrangement"  
Majorana-Raychaudhuri Seminars (online) (June 14, 2024)
- "Ultraheavy Atomic Dark Matter Freeze-Out through Rearrangement"  
University of Electronic Science and Technology of China (May 10, 2024)
- "Ultraheavy Atomic Dark Matter Freeze-Out through Rearrangement"  
City University of Hong Kong (March 14, 2024)
- "Can We Explain Cosmic Birefringence Without a New Light Field beyond the Standard Model?"  
2024 IAS program on HEP, HKUST (Jan 16, 2024)
- "Can We Explain Cosmic Birefringence Without a New Light Field beyond the Standard Model?"  
Jagiellonian University (Nov 23, 2023)
- "Can We Explain Cosmic Birefringence Without a New Light Field beyond the Standard Model?"  
OKC & Nordita Theoretical Cosmology journal club, Stockholm University (Nov 16, 2023)
- "High-quality Axions in a Class of Chiral  $U(1)$  Gauge Theories"  
Tsinghua University (Oct 19, 2023)
- "Axi-Higgs Cosmology"  
Purple Mountain Observatory, Chinese Academy of Sciences (May 25, 2023)
- "High-quality Axions in a Class of Chiral  $U(1)$  Gauge Theories"  
IAS program on Particle Theory, HKUST (Mar 07, 2023)

- “Axi-Higgs Cosmology”  
SYSU-PKU Collider physics forum For Young scientists (SPeCial4Young) (Online) (Nov 02, 2022)
- “Linking the Supersymmetric Standard Model to the Cosmological Constant”  
The XXVIII International Conference on Supersymmetry and Unification of Fundamental Interactions  
SUSY 2021 (Online) (Aug 23, 2021)
- “Linking the Supersymmetric Standard Model to the Cosmological Constant”  
Phenomenology 2021 Symposium (Online) (May 24, 2021)

## Teaching Experience

- PHYS 5260 Advanced Quantum Mechanism | TA, HKUST Fall 2019
- PHYS 5260 Advanced Quantum Mechanism | TA, HKUST Spring 2019
- PHYS 3033 Electricity and Magnetism I | TA, HKUST Fall 2018
- PHYS 1114 General Physics II | TA, HKUST Spring 2018
- PHYS 3126 Optics | TA, Soochow U. Fall 2015

## Peer Review

- Physics Letters A | Reviewer 2024