Qianhang Ding

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Education

PhD in Physics 09/2018 – 06/2023
Department of Physics, The Hong Kong University of Science and Technology

Bachelor of Science 09/2014 – 06/2018
Department of Physics, College of Physics and Electronic Engineering, Shanxi University

Employment

Senior Researcher 10/2023 – present
Center for Theoretical Physics of the Universe (CGA Group), Institute for Basic Science

QUPIP Researcher 05/2024 – 06/2024
International Center for Quantum-field Measurement Systems for Studies of the Universe and Particles

Research Assistant 09/2022 – 08/2023
Department of Physics, The Hong Kong University of Science and Technology

Research

Research Interests

Theory: gravitational wave cosmology, cosmic tensions, primordial black hole, and fundamental topics
Observation: multi-messenger astronomy such as CMB physics, gravitational wave and pulsar astronomy

Research Works

Standard Timers: tracking redshift-time relation through the statistics in cosmological dynamical systems
Hubble Parameter Measurement with PBHs: using the statistics in PBH systems to probe Hubble parameter
Dark Matter in Multi-messenger Astronomy: studying the imprints of dark matter with multi-messengers
Cosmic Tension in Void: reconciling Hubble tension and CMB anomalies in void cosmology
Collider in the Universe: studying cosmological collider in CMB and gravitational collider in PSR-BH binary

Summary of Publications

INSPIRE HEP: 178 citations, h-index: 7, 16.2 citations per paper

Teaching Assistant

PHYS3031: Mathematical Methods in Physics II, HKUST — Fall Term 2020 – 2021

PHYS1114: General Physics II, HKUST — Fall & Spring Term 2019 – 2020

PHYS1002: Introduction to Astrophysics and Astronomy, HKUST — Spring Term 2018 – 2019

Project Mentoring

Capstone Project: Three Body System Analysis, Mentoring for three students, HKUST — 2020 – 2021

Awards and Distinctions

Selected Young Scientist Participant, *The Hong Kong Laureate Forum* — 2022

Honorable Mention for Best Teaching Assistant, *Department of Physics, HKUST* — 2020

Postgraduate Studentship, *HKUST* — 2018 – 2022

National Scholarship, *Ministry of Education of the People's Republic of China* — 2016

Service

The journal referee for *The Astrophysical Journal Letters*

The organizer of IBS CTPU-CGA Workshop on (Primordial) Black Holes and Gravitational Waves 2024

The chair of 2023 Joint Annual Conference of Physical Societies in Greater Bay Area 2023

The organizer of journal club talk series at fundamental physics group of IAS HKUST 2018 – 2022

The assistant of IAS Program on High Energy Physics 2019, 2020, 2022

The assistant of IAS Workshop on Black Holes, Inflation and Gravitational Waves 2019

The assistant of Pan Pearl River Delta Physics Olympiad 2019, 2020, 2022

Skills

Computer Languages	Mathematica, Python, C, HTML, CSS, LaTeX
Programming	MCMC, N–body simulation, Gradient descent, Error BP algorithm
Software Tools	BlackHawk, CAMB, MathGR, Blender
Outreach	Astrophotography [Channel] Popular science article for the Hong Kong Laureate Forum [Link]

Conference & Seminar Talks

Cosmology from Home 2024 [Video] 27/06/2024
The Merger Rate of Primordial Black Hole Binaries as a Probe of Hubble Parameter

Seminar Talk, *Jinan University* 20/06/2024
A Dark Matter Probe in Accreting Pulsar-Black Hole Binaries

International Symposium on Cosmology and Particle Astrophysics CosPA 2024, *Ningbo U* 16/06/2024
The Merger Rate of Primordial Black Hole Binaries as a Probe of Hubble Parameter

Seminar Talk, *High Energy Accelerator Research Organization, KEK* 06/06/2024
A Gigaparsec-scale Local Void and Cosmological Principle

IBS CTPU-CGA 2024 Workshop on (Primordial) Black Holes and Gravitational Waves 19/03/2024
Primordial Black Hole Binaries as a Probe of Hubble Parameter

Gravity and Cosmology 2024, *Yukawa Institute for Theoretical Physics, Kyoto University* 06/02/2024
Reconciling Cosmic Dipolar Tensions with a Gigaparsec Void

High1 Workshop on Paritcle, String and Cosmology, *KIAS and IBS CTPU-CGA* 24/01/2024
Primordial Black Hole Binaries as a Probe of Hubble Parameter

New Perspectives on Cosmology 2024, *APCTP* 11/01/2024
Primordial Black Hole Binaries as a Probe of Hubble Parameter

International Workshop on Multi-probe approach to wavy dark matters, *Korea University* 30/11/2023
A Dark Matter Probe in Accreting Pulsar-Black Hole Binaries

International Symposium on Cosmology and Particle Astrophysics CosPA 2023, *CUHK* 12/11/2023
A Dark Matter Probe in Accreting Pulsar-Black Hole Binaries

Seminar Talk, *Huazhong University of Science and Technology* 14/09/2023

A Dark Matter Probe in Accreting Pulsar-Black Hole Binaries

2023 Joint Annual Conference of Physical Societies in Greater Bay Area, *CityU* 02/08/2023
Reconciling Cosmic Dipolar Tensions with a Gigaparsec Void

Cosmology from Home 2023 [Video] 06/07/2023
Reconciling Cosmic Dipolar Tensions with a Gigaparsec Void

Seminar Talk, *Chongqing University* 26/04/2023
A Dark Matter Probe in Accreting Pulsar-Black Hole Binaries

Gravitation and Relativistic Astrophysics 2023, CPS, *Chongqing University* 23/04/2023
A Gigaparsec-scale Local Void and Cosmological Principle

Seminar Talk, *Sun Yat-Sen University* 10/03/2023
Measure the Universe with Cosmological Standard Timers

Seminar Talk, *Sun Yat-Sen University* 08/03/2023
A Gigaparsec-scale Local Void and Cosmological Principle

Seminar Talk, *Tsung-Dao Lee Institute* 13/02/2023
A Gigaparsec-scale Local Void and Cosmological Principle

Seminar Talk, *Tsinghua University* 26/10/2022
A Gigaparsec-scale Local Void and Cosmological Principle

Seminar Talk, *Institute of Theoretical Physics, Chinese Academy of Science* [Video] 20/10/2022
Measure the Universe with Cosmological Standard Timers

The 15th Asia Pacific Physics Conference, *AAPPS, Korean Physical Society* 23/08/2022
Cosmological Standard Timers in Primordial Black Hole Scenarios

The 23rd International Conference on General Relativity and Gravitation, *ITP, CAS* 07/07/2022
Cosmological Standard Timers in Primordial Black Hole Scenarios

Cosmology from Home 2022 [Video] 05/07/2022
Cosmological Standard Timers in Primordial Black Hole Scenarios

Gravity: Current challenges in black hole physics and cosmology, *YITP, Kyoto University* 29/06/2022
Cosmological Standard Timers from Unstable Primordial Relics

Atlantic General Relativity 2022, *Memorial University of Newfoundland and Labrador* 18/05/2022
Cosmological Standard Timers from Unstable Primordial Relics

The KEK–PH + KEK–Cosmo joint workshop on "Primordial Black Holes", *KEK* 19/10/2021
Ultrahigh-energy Gamma Rays and Gravitational Waves from Primordial Exotic Stellar Bubbles

The 24th International Conference on Particle Physics and Cosmology, *UIUC* 05/08/2021
Ultrahigh-energy Gamma Rays and Gravitational Waves from Primordial Exotic Stellar Bubbles

Innovative Talk, USTC Seminar Series, *University of Science and Technology of China* 30/05/2021
Ultrahigh-energy Gamma Rays and Gravitational Waves from Primordial Exotic Stellar Bubbles

Seminar Talk, *Particle Cosmology Group, University of Science and Technology of China* 19/11/2019
Detectability of Gravitational Waves from the Coalescence of Massive PBHs with Initial Clustering

Gordon Research Seminar on Particle Physics, *HKUST* 29/06/2019
Detectability of Gravitational Waves from the Coalescence of Massive PBHs with Initial Clustering