Hao Y. Zhang

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Current Academic Position

Postdoctoral Fellow, Kavli IPMU, University of Tokyo
2023.10 - Present (Expected to finish by 2026.10)

Education and Degrees

Ph.D., Department of Physics and Astronomy, School of Arts and Sciences, University of Pennsylvania
Advisor: Prof. Mirjam Cvetič, Co-Advisor: Prof. Jonathan Heckman
Aug. 2018 - Aug. 2023

B.S. in Physics, School of Physics, Peking University
Major: Physics
Sep. 2014 - Jul. 2018

Publications

17. Craig Lawrie, Xingyang Yu, Hao Y. Zhang, Intermediate Defect Groups, Polariation Pairs, and Non-invertible Duality Defects, *arXiv: 2306.11783*

16. Jonathan J. Heckman, Max Hubner, Ethan Torres, Xingyang Yu, Hao Y. Zhang, Top Down Approach to Topological Duality Defects, *Phys.Rev.D 108 (2023) 4, 046015*

15. Jonathan J. Heckman, Max Hubner, Ethan Torres, Hao Y. Zhang, The Branes Behind Generalized Symmetry Operators, *Fortschr. Phys. 2022, 2200180*

14. Jonathan J. Heckman, Craig Lawrie, Ling Lin, Hao Y. Zhang and Gianluca Zoccarato, 6D SCFTs, Center-Flavor Symmetries, And Stiefel—Whitney Compactifications, Phys.Rev.D 106 (2022) 6, 066003

13. Mirjam Cvetič, Markus Dierigl, Ling Lin and Hao Y. Zhang, All Eight and Nine Dimensional String Vacua From Junctions, Phys.Rev.D 106 (2022) 2, 026007

12. Michele del Zotto, Jonathan J. Heckman, Shani Nadir Meynet, Robert Moscrop, and Hao Y. Zhang, Higher Symmetries of 5d Orbifold SCFTs, Phys.Rev.D 106 (2022) 4, 046010

11. Mirjam Cvetič, Markus Dierigl, Ling Lin and Hao Y. Zhang, Gauge Group Topology of 8D Chaudhuri-Hockney-Lykken Vacua, Phys.Rev.D 104 (2021) 8, 086018

10. Mirjam Cvetič, Markus Dierigl, Ling Lin and Hao Y. Zhang, Higher-Form Symmetries and Their Anomalies in M-/F-Theory Duality, Phys.Rev.D 104 (2021) 12, 126019

9. Jonathan J. Heckman, Sandipan Kundu and Hao Y. Zhang, EFT of 6D SUSY RG Flows, Phys.Rev.D 104 (2021) 8, 085017.

8. Jonathan J. Heckman, Craig Lawrie, Thomas B. Rochais, Hao Y. Zhang and Gianluca Zoccarato, S-folds, String junctions, and 4D N=2 SCFTs, Phys.Rev.D 103 (2021) 8, 086013

7. Mirjam Cvetič, Markus Dierigl, Ling Lin and Hao Y. Zhang, String Universalities and Non-Simply-Connected Gauge Groups in 8d, Phys.Rev.Lett. 125 (2020) 21, 211602

6. Fabio Apruzzi, Marco Fazzi, Jonathan J. Heckman, Tom Rudelius and Hao Y. Zhang, General prescription for global U(1)'s in 6D SCFTs, Phys.Rev.D 101 (2020) 8, 086023

5. Falk Hassler, Jonathan J. Heckman, Thomas B. Rochais, Tom Rudelius and Hao Y. Zhang, T-branes, String Junctions, and 6D SCFTs, Phys.Rev.D 101 (2020) 8, 086018

4. Mirjam Cvetič, Ling Lin, Muyang Liu, Hao Y. Zhang and Gianluca Zoccarato, Yukawa Hierarchies in Global F-theory Models, JHEP 01 (2020) 037

3. Vijay Varma, Davide Gerosa, Leo C. Stein, François Herbert and Hao Zhang, High-accuracy mass, spin and recoil predictions of general black-hole merger remnants, Phys.Rev.Lett. 122 (2019) 1, 011101

2. Hao Zhang, Richard de Grijs, Chengyuan Li and Xiaohan Wu, No Evidence for Chemical Abundance Variation in Intermediate-age Cluster NGC 1783, The Astrophysical Journal, 853:186 (9pp), 2018 February 1

1. Hao Zhang, Daniel J. Eisenstein, Lehman H. Garrison and Douglas W. Ferrer, Testing the Detection Significance on the Large Scale Structure by a JWST Deep Field Survey, The Astrophysical Journal, 875 (2019) 2, 132

Research Talks

Non-Invertible Duality Symmetry via Relative QFT and "Polarization Pair", 1.5-hour in-person seminar, BIMSA (Beijing Institute of Mathematical Sciences and Applications), Sep. 2023

Discrete Aspects of String Landscape and String Universality in High Dimensions, 1-hour in-person seminar, Department of Math, Tsinghua University, Sep. 2023

Non-Invertible Duality Symmetry via Relative QFT and "Polarization Pair", 1-hour in-person seminar, School of Physics, Peking University, Sep. 2023

Discrete Aspects of String Landscape and String Universality in High Dimensions, 1-hour in-person seminar, Texas A&M University, Apr 2023

Discrete Aspects of String Landscape and String Universality in High Dimensions, 1.5 hour in-person seminar, Penn string theory group, Apr 2023

Generalized Symmetry Operators from Branes, 30 mins online seminar, on Seminar Series in String Phenomenology, Oct 2022

Generalized Symmetry Operators from Branes, 5-min gong show and poster presentation, Generalized Global Symmetries, Quantum Field Theory, and Geometry, SCGP, Stony Brook

String universality in 8D and 9D, Graduate High-Energy Physics Seminar, University of Pennsylvania, May 2022

Higher Symmetries of 5d Orbifold SCFTs, 30 mins in-person talk, Geometrization of (S)QFT in $D \leq 6$, Aspen, Feb 2022

Effective Field Theory of 6D (1,0) Renormalization Group Flows, Online Poster presentation, Strings 2021

String Universality and Non-Simply-Connected Gauge Groups in 8D, 30 mins online talk, on Seminar Series in String Phenomenology, Sep 2020

General prescription for global U(1)'s in 6D SCFTs, Online gong show + poster presentation, on Quantum Field Theory and Geometry Summer School, Jun 2020

Compactification of Heterotic Strings, Graduate String Seminar, May 2019

Keck Spectroscopy of NGVS Sources: Milky Way Halo Star Kinematics, In-person poster presentation, on the 229th Americal Astronomical Society (AAS) Meeting, Jan 2017

Awards

2019 Orville Phillips Fellowship Award, year of 2018-2019, SAS, Penn

2018 Outstanding Graduates of Beijing

2015/2016/2017 WeiMing XueZi Scholarship (School of Physics, Peking University, CNY 17,000 Total)

2016 National Scholarship of China, Peking University (top 2%, CNY 8,000)

2016 Outstanding Merit Student of Peking University

2013 Gold Medal in China Physics Olympics (CPhO) Final (rank 16/300)

Teachings: TA positions Held

Physics 151: Electromagnetism, TA, 2023 Spring

Physics 522: Introduction to Elementary Particle Physics, TA, 2023 Spring

Physics 632: Quantum Field Theory II, Grading, 2022 Spring

Physics 601: Introduction to Quantum Field Theory, Grading, 2021 Fall

Physics 151 Labs: Electromagnetism (Remote), Grading, 2021 Summer

Math 312: Linear Algebra, Grading, 2021 Spring

Math 114 Calculus II: Multivariable Calculus, Leading recitations + grading, 2020 Fall

Physics 101 Labs: Mechanics (Remote), Grading, 2020 Summer

Physics 151 Labs: Electromagnetism (Remote), Grading, 2020 Summer

Physics 151: Electromagnetism, Grading, 2020 Summer

Math 210: Math in the age of info, Grading, 2020 Spring

Math 104 Calculus I: Integrals and Series, Leading recitations + grading, 2019 Fall

Physics 151 Labs: Electromagnetism, Leading recitations + grading, 2019 Summer

Physics 171: Honor Electromagnetism, Grading, 2019 Spring

Physics 170: Honor Mechanics, Grading, 2018 Fall

Computational Physics (Peking University), Leading recitations + grading, 2018 Spring