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Current Academic Position

Postdoctoral Fellow, Kavli IPMU, University of Tokyo
2023.10 - Present (Expected to end in 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

19. Yuji Tachikawa, Hao Y. Zhang, On a Z_3 -valued Discrete Topological Term in 10D Heterotic String Theories, *arxiv: 2403.08861*
18. Justin Kaidi, Yuji Tachikawa, Hao Y. Zhang, On a Class of Selection Rules without Group Actions in Field Theory and String Theory, *arxiv: 2402.00105*
17. Craig Lawrie, Xingyang Yu, Hao Y. Zhang, Intermediate Defect Groups, Polarization Pairs, and Non-invertible Duality Defects, *Phys.Rev.D 109 (2024) 2, 026005*
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 in 6D and "Polarization Pair", Theoretical High-Energy Theory Seminars, Department of Physics and Astronomy, University of Pennsylvania, Dec. 2023

Non-Invertible Duality Symmetry in 6D and "Polarization Pair", Simons Center of Geometry and Physics, Dec. 2023

Non-Invertible Duality Symmetry in 6D and "Polarization Pair", Swampland Seminar Series, Department of Physics, Harvard University, Nov. 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 Series in String Pheno, 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 Hep-th 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 Session, 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 American 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