Kevin Zhou

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Education

Stanford University (expected) 2019 – 2024
PhD in Physics (advisor: Natalia Toro)

Oxford University (New College) 2018 – 2019
MSc in Mathematical and Theoretical Physics with distinction

Cambridge University (St. John's College) 2017 – 2018
MASt in Mathematics with distinction

Massachusetts Institute of Technology 2013 – 2017
BS in Physics and Mathematics

Fellowships and Awards

NSF Graduate Research Fellowship	2017 – 2022
Marshall Scholarship	2017 – 2019
Demuth Prize, New College	2019
Dirac Prize, St. John's College	2018
Finalist, Hertz Fellowship	2017
Joel Matthew Orloff Award for Outstanding Research, MIT	2017
Honorable Mention, Putnam Mathematical Competition	2016, 2017
Gold Medal, International Physics Olympiad	2012, 2013
Winner, USA Junior Mathematical Olympiad	2011

Publications

2209.12901 Discovering QCD-Coupled Axion Dark Matter with Polarization Haloscopes
A. Berlin, K. Zhou

2112.02104 Probing Invisible Vector Meson Decays with the NA64 and LDMX Experiments
P. Schuster, N. Toro, K. Zhou, Phys. Rev. D (2022)

2106.09033 Stellar Shocks From Dark Matter Asteroid Impacts
A. Das, S. A. R. Ellis, P. Schuster, K. Zhou, Phys. Rev. Lett. (2022)

2007.15656 Heterodyne Broadband Detection of Axion Dark Matter
A. Berlin, R. T. D'Agnolo, S. A. R. Ellis, K. Zhou, Phys. Rev. D (2021)

1912.11048 Axion Dark Matter Detection by Superconducting Resonant Frequency Conversion
A. Berlin, R. T. D'Agnolo, S. A. R. Ellis, C. Nantista, J. Neilson,
P. Schuster, S. Tantawi, N. Toro, K. Zhou, JHEP (2020)

1704.06266 Casimir Meets Poisson: Improved Quark/Gluon Discrimination with Counting Observables
C. Frye, A. Larkoski, J. Thaler, K. Zhou, JHEP (2017)

1704.05456 Generalized Fragmentation Functions for Fractal Jet Observables
B. Elder, M. Procura, J. Thaler, W. Wallewijn, K. Zhou, JHEP (2017)

1703.04722 Minimum Energetic Cost to Maintain a Target Nonequilibrium State
J. Horowitz, K. Zhou, J. England, Phys. Rev. E (2017)

Talks

Discovering the QCD Axion with Polarization Haloscopes
- TRIUMF Theory Seminar 10/2022
- University of Victoria Theory Seminar 10/2022

Theory and Phenomenology of Continuous Spin Particles
- Perimeter Institute Theory Seminar 10/2022

Flashes in the Dark: New Searches for Axions and Macroscopic Dark Matter
- Johns Hopkins Theory Seminar 9/2022

Probing Dark Sectors With Invisible Vector Meson Decays
- Phenomenology 2022 Symposium 5/2022
- APS April Meeting 2022 4/2022
- ILC Workshop on Potential Experiments (ILCX2021) 10/2021

Searching for Ultraheavy and Ultralight Dark Matter
- SLAC Theory Seminar 3/2022

Stellar Shocks From Dark Asteroids
- 24th International Conference on Particle Physics and Cosmology (COSMO'21) 8/2021
- APS Division of Particles & Fields Meeting (DPF21) 7/2021
- Phenomenology 2021 Symposium 5/2021

Heterodyne Detection of Axion Dark Matter
- Virtual Axion Institute 8/2020

Teaching

Physics 330: Quantum Field Theory I Autumn 2022

- Ran weekly sections, helped write, edit, and grade problem sets, and wrote solutions

Outreach

U.S. Physics Olympiad 2015 – present

- Wrote and edited the largest physics competition in the United States (6,000 participants)
- Released 1,000 pages of original learning materials, used by students around the world
- Taught classes on problem solving and lab skills to finalists at annual summer camps
- Intensively trained team to represent the U.S. at the 2021 International Physics Olympiad, leading to its first ever 5 gold medal finish

Physics StackExchange 2014 – 2020

- Wrote answers on topics ranging from everyday physics to quantum field theory
- Total of over 1,000 answers with 2 million total views

Splash 2013 – 2019

- Spoke to high school students at annual Splash events hosted at MIT, Oxford, and Stanford
- Taught classes on quantum cryptography, dimensional analysis, chirality, and particle detectors

Press coverage 2022

- Participated in several interviews for "Stellar Shocks From Dark Matter Asteroid Impacts" (Altmetric score of 200+, in top 1% of PRL outputs)

National Science Bowl 2022

- Wrote and edited physics questions for the U.S. Department of Energy's flagship middle school and high school outreach event (∼10,000 participants)