Kevin Zhou

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Education

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

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

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

Massachusetts Institute of Technology 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

2303.04816 Interactions of Particles with "Continuous Spin" Fields
P. Schuster, N. Toro, K. Zhou, JHEP 04, 010 (2023)

2209.12901 Discovering QCD-Coupled Axion Dark Matter with Polarization Haloscopes
A. Berlin, K. Zhou, Phys. Rev. D 108, 035038 (2023)

2112.02104 Probing Invisible Vector Meson Decays with the NA64 and LDMX Experiments
P. Schuster, N. Toro, K. Zhou, Phys. Rev. D 105, 035036 (2022)

2106.09033 Stellar Shocks From Dark Matter Asteroid Impacts
A. Das, S. A. R. Ellis, P. Schuster, K. Zhou, Phys. Rev. Lett. 128, 021101 (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 104, L111701 (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 07, 088 (2020)

1704.06266 Casimir Meets Poisson: Improved Quark/Gluon Discrimination with Counting Observables
C. Frye, A. Larkoski, J. Thaler, K. Zhou, JHEP 09, 083 (2017)

1704.05456 Generalized Fragmentation Functions for Fractal Jet Observables
B. Elder, M. Procura, J. Thaler, W. Wallewijn, K. Zhou, JHEP 06, 085 (2017)

1703.04722 Minimum Energetic Cost to Maintain a Target Nonequilibrium State
J. Horowitz, K. Zhou, J. England, Phys. Rev. E 95, 042102 (2017)

Talks

Electromagnetism and Gravity with Continuous Spin

Caltech High Energy Physics Seminar	10/23
UC Santa Cruz SCIPP Seminar	10/23
ICTP HECAP Seminar	7/23
CERN BSM Forum	6/23
UC Davis QMAP Particle/Cosmology Seminar	4/23
UC Berkeley "4D" Seminar	4/23
Stanford Phenomenology Seminar	2/23
Perimeter Institute Theory Seminar	10/22

Discovering the QCD Axion with Polarization Haloscopes

18th Patras Workshop on Axions, WIMPs and WISPs	7/23
Phenomenology 2023 Symposium	5/23
Fermilab Theory Seminar	4/23
TRIUMF Theory Seminar	10/22
University of Victoria Theory Seminar	10/22

Flashes in the Dark: New Searches for Axions and Macroscopic Dark Matter

Johns Hopkins Theory Seminar	9/22

Probing Dark Sectors With Invisible Vector Meson Decays

Phenomenology 2022 Symposium	5/22
APS April Meeting 2022	4/22
ILC Workshop on Potential Experiments (ILCX2021)	10/21

Searching for Ultraheavy and Ultralight Dark Matter

SLAC Theory Seminar	3/22

Stellar Shocks From Dark Asteroids

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

Heterodyne Detection of Axion Dark Matter

Virtual Axion Institute	8/20

Teaching

Physics 120: Intermediate Electricity and Magnetism I 2023

Physics 330: Quantum Field Theory I 2022

- Ran weekly sections and office hours; helped write, edit, solve, and grade new problem sets

Outreach

U.S. Physics Olympiad 2015 – present

- Wrote and edited the largest physics competition in the United States (6,000 participants)
- Developed 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 training camps
- Served as deputy leader of the U.S. delegation for the 2023 International Physics Olympiad

Physics StackExchange 2014 – 2020

- Wrote 1,000 answers for questions on all fields of physics, with over 2 million total views

Press coverage 2022

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

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)

Local outreach and department activities

- Judged research presentations for the US Invitational Young Physicists Tournament 2023
- Participated on various panels for undergraduates and incoming graduate students 2020
- Presented ∼10 papers at Stanford and SLAC journal clubs 2020 – 2022
- Taught high school students at "Splash" events at MIT, Oxford, and Stanford 2013 – 2019

Service

Snowmass Community Planning Exercise 2021 – 2023

- Contributed figures, text, and editing to white papers, in particular on *Axion Dark Matter*

Peer review 2023

- Refereed for *Journal of High Energy Physics*, *American Journal of Physics*, and *World Scientific*