

Education

Stanford University PhD in Physics (advisor: Natalia Toro)	(expected) 2019 – 2024
Oxford University (New College) MSc in Mathematical and Theoretical Physics with distinction	2018 – 2019
Cambridge University (St. John's College) MASt in Mathematics with distinction	2017 – 2018
Massachusetts Institute of Technology BS in Physics and Mathematics	2013 – 2017

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
- 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

- [Electromagnetism and Gravity with Continuous Spin](#)
Stanford Phenomenology Seminar 2/2023
- [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 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 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)