

## Education

<b>Stanford University</b> PhD in Physics (advisor: Natalia Toro)	(expected) 2019 – 2024
<b>Oxford University</b> (New College) MSc in Mathematical and Theoretical Physics with distinction	2018 – 2019
<b>Cambridge University</b> (St. John's College) MASt in Mathematics with distinction	2017 – 2018
<b>Massachusetts Institute of Technology</b> 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, JHEP (2023)
- 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

ICTP HECAP Seminar	7/2023
CERN BSM Forum	6/2023
UC Davis QMAP Particle/Cosmology Seminar	4/2023
UC Berkeley "4D" Seminar	4/2023
Stanford Phenomenology Seminar	2/2023
Perimeter Institute Theory Seminar	10/2022

### Discovering the QCD Axion with Polarization Haloscopes

18th Patras Workshop on Axions, WIMPs and WISPs	7/2023
Phenomenology 2023 Symposium	5/2023
Fermilab Theory Seminar	4/2023
TRIUMF Theory Seminar	10/2022
University of Victoria Theory Seminar	10/2022

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

Johns Hopkins Theory Seminar	9/2022
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### 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
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### 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
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## Teaching

Physics 120: Intermediate Electricity and Magnetism I	2023
Physics 330: Quantum Field Theory I	2022
<ul style="list-style-type: none"> <li>Ran weekly sections and office hours; helped write, edit, solve, and grade new problem sets</li> </ul>	

## Outreach

U.S. Physics Olympiad	2015 – present
<ul style="list-style-type: none"><li>• <a href="#">Wrote and edited</a> the largest physics competition in the United States (6,000 participants)</li><li>• Developed 1,000 pages of <a href="#">original learning materials</a>, used by students around the world</li><li>• Taught classes on problem solving and lab skills to finalists at annual summer camps</li><li>• Intensively trained team to represent the U.S. at the 2021 International Physics Olympiad, leading to its first ever 5 gold medal finish</li></ul>	
Physics StackExchange	2014 – 2020
<ul style="list-style-type: none"><li>• Wrote <a href="#">answers</a> on topics ranging from everyday physics to quantum field theory</li><li>• Total of over 1,000 answers with 2 million total views</li></ul>	
Splash	2013 – 2019
<ul style="list-style-type: none"><li>• Spoke to high school students at annual Splash events hosted at MIT, Oxford, and Stanford</li><li>• Taught classes on quantum cryptography, dimensional analysis, chirality, and particle detectors</li></ul>	
Press coverage	2022
<ul style="list-style-type: none"><li>• Participated in several interviews for “Stellar Shocks From Dark Matter Asteroid Impacts” (Altmetric score of 200+, in top 1% of PRL outputs)</li></ul>	
National Science Bowl	2022
<ul style="list-style-type: none"><li>• Wrote and edited physics questions for the U.S. Department of Energy’s flagship middle school and high school outreach event (~10,000 participants)</li></ul>	