

Education

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| 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

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| 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

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| 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

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| 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

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| Johns Hopkins Theory Seminar | 9/2022 |
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Probing Dark Sectors With Invisible Vector Meson Decays

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| 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

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| SLAC Theory Seminar | 3/2022 |
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Stellar Shocks From Dark Asteroids

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| 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

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

Outreach

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| U.S. Physics Olympiad | 2015 – present |
| <ul style="list-style-type: none">• 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 |
| <ul style="list-style-type: none">• 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 |
| <ul style="list-style-type: none">• 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 |
| <ul style="list-style-type: none">• 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 |
| <ul style="list-style-type: none">• Wrote and edited physics questions for the U.S. Department of Energy’s flagship middle school and high school outreach event (~10,000 participants) | |