TANNER D. TRICKLE

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EDUCATION

California Institute of Technology July 2020 - Present
Ph.D. in Physics
Advisor: Kathryn M. Zurek

University of California, Berkeley August 2017 - July 2020
Ph.D. in Physics (initial progress towards degree)
Advisor: Kathryn M. Zurek

Massachusetts Institute of Technology September 2013 - May 2017
B.S. in Physics
B.S. in Mathematics
Minor in Economics

PUBLICATIONS

- S. M. Griffin, K. Inzani, T. Trickle, Z. Zhang, and K. M. Zurek, "Extended Calculation of Dark Matter-Electron Scattering in Crystal Targets," arXiv:2105.05253 [hep-ph]
- V. S. H. Lee, S. R. Taylor, T. Trickle, and K. M. Zurek, "Bayesian Forecasts for Dark Matter Substructure Searches with Mock Pulsar Timing Data," arXiv:2104.05717 [astro-ph.CO]
- A. Coskuner, T. Trickle, Z. Zhang, and K. M. Zurek, "Directional Detectability of Dark Matter With Single Phonon Excitations: Target Comparison," arXiv:2102.09567 [hep-ph]
- V. S. H. Lee, A. Mitridate, T. Trickle, and K. M. Zurek, "Probing Small-Scale Power Spectra with Pulsar Timing Arrays," arXiv:2012.09857 [astro-ph.CO]
- T. Trickle, Z. Zhang, and K. M. Zurek, "Effective Field Theory of Dark Matter Direct Detection With Collective Excitations," arXiv:2009.13534 [hep-ph]
- A. Mitridate, T. Trickle, Z. Zhang, and K. M. Zurek, "Detectability of Axion Dark Matter with Phonon Polaritons and Magnons," arXiv:2005.10256 [hep-ph]
- H. Ramani, T. Trickle, and K. M. Zurek, "Observability of Dark Matter Substructure with Pulsar Timing Correlations," arXiv:2005.03030 [astro-ph.CO]
- S. M. Griffin, K. Inzani, T. Trickle, Z. Zhang, and K. M. Zurek, "Multichannel direct detection of light dark matter: Target comparison," *Phys. Rev. D* **101** (2020) no. 5, 055004, arXiv:1910.10716 [hep-ph]
  - ◇ *PRD editors' suggestion*
- T. Trickle, Z. Zhang, K. M. Zurek, K. Inzani, and S. Griffin, "Multi-Channel Direct Detection of Light Dark Matter: Theoretical Framework," *JHEP* **03** (2020) 036, arXiv:1910.08092 [hep-ph]
- T. Trickle, Z. Zhang, and K. M. Zurek, "Detecting Light Dark Matter with Magnons," *Phys. Rev. Lett.* **124** (2020) no. 20, 201801, arXiv:1905.13744 [hep-ph]
- J. A. Dror, H. Ramani, T. Trickle, and K. M. Zurek, "Pulsar Timing Probes of Primordial Black Holes and Subhalos," *Phys. Rev. D* **100** (2019) no. 2, 023003, arXiv:1901.04490 [astro-ph.CO]

CONFERENCES & PRESENTATIONS

Phenomenology 2021 Symposium May 2021
Improved Calculation of Dark Matter-Electron Scattering in Semiconductors

NANOGrav Group Meeting April 2021
PTA Signals from Dark Matter Subhalos

University of California, Berkeley 4D Seminar January 2020
Multi-Channel Direct Detection of Light Dark Matter

California Institute of Technology Particle Theory Group December 2019
Multi-Channel Direct Detection of Light Dark Matter

AWARDS

John S. Stemple Memorial Prize June 2021
For outstanding progress in research and excellent performance on the oral candidacy exam.

SOFTWARE

: https://github.com/tanner-trickle

EXCEED-DM: EXtended Calculation of Electronic Excitations for Direct detection of Dark Matter, https://github.com/tanner-trickle/EXCEED-DM

dm-phonon-scatter: Compute the dark matter-single phonon scattering rate for a general scattering potential. https://github.com/tanner-trickle/dm-phonon-scatter

Dark Matter-Single Phonon Interaction Rate Calculator: Repository of results for dark matter-single phonon scattering. Compute constraints, differential rate and daily modulation signals for a variety of dark matter models and targets. https://demo-phonon-web-app.herokuapp.com/

Proficient in: Django, Fortran, JupyterLab, LaTeX, Mathematica, OpenMPI, OpenMP, Python

Knowledge of: Bash, Matlab, Slurm

PRESS

Universe Today, *A Tabletop-sized Experiment Could Help in the Search for Dark Matter*

SciTech Daily, *CalTech Physicists Propose Innovateive New Experiment for Detecting Dark Matter*

Caltech, *Thinking Small: New Ideas in the Search for Dark Matter*

TEACHING

Teaching Assistant, California Institute of Technology
Physics 205b, Relativistic Quantum Field Theory January 2021 - March 2021

Graduate Student Instructor, University of California, Berkeley
Physics 7A, Physics for Scientists and Engineers August 2017 - June 2018
Physics 89, Introduction to Mathematical Physics June 2018 - August 2018