

WENZER QIN

CONTACT INFORMATION

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EDUCATION

2019-present Massachusetts Institute of Technology, Cambridge, MA
 Advisor: Prof. Tracy SLATYER
 Ph.D., Physics; GPA: 5.0/5.0

2015-2019 Johns Hopkins University, Baltimore, MD
 Advisors: Prof. Marc KAMIONKOWSKI, Prof. Nadia ZAKAMSKA, Prof. Andrei GRITSAN
 B.S., Physics; B.A., Mathematics; GPA: 3.99/4.0 (Major GPA: 4.0/4.0)

AWARDS AND HONORS

- 2023 · Nominated for the Ohio State University CCAPP Price Prize
- 2021 · MIT Physics Graduate Student Service Award
- 2019 · NSF Graduate Research Fellowship
 - LeRoy Apker Award Finalist
 - C. M. Clay and Henry W. Kendall Fellowships (MIT First Year Fellowships)
 - Donald E. Kerr Memorial Award for outstanding graduating senior in Physics
 - J.J. Sylvester Award for outstanding graduating senior in Mathematics
- 2018 · Barry Goldwater Scholarship
 - Caltech's FUTURE of Physics program for outstanding undergraduate women in physics
 - Johns Hopkins STAR Award for summer research
- 2017 · Inducted into Sigma Pi Sigma ($\Sigma \Pi \Sigma$)
 - Maryland Space Grant recipient for summer research
 - 2nd Place Presentation, Maryland Space Grant Consortium Student Research Symposium

PUBLICATIONS (* INDICATES ALPHABETICAL AUTHORSHIP ORDER)

- [11] **W. Qin**, J. B. Munoz, H Liu, and T. R. Slatyer. "Birth of the first stars amidst decaying and annihilating dark matter". August 2023. [arXiv:2308.12992](https://arxiv.org/abs/2308.12992) [[astro-ph.CO](https://arxiv.org/archive/astro)]
- [10] * H. Liu, **W. Qin**, G. W. Ridgway, and T. R. Slatyer. "Exotic energy injection in the early universe II: CMB spectral distortions and constraints on light dark matter". March 2023. [arXiv:2303.07370](https://arxiv.org/abs/2303.07370) [[astro-ph.CO](https://arxiv.org/archive/astro)]
- [9] * H. Liu, **W. Qin**, G. W. Ridgway, and T. R. Slatyer. "Exotic energy injection in the early universe I: a novel treatment for low-energy electrons and photons". March 2023. [arXiv:2303.07366](https://arxiv.org/abs/2303.07366) [[astro-ph.CO](https://arxiv.org/archive/astro)]
- [8] **W. Qin**, S. R. Geller, S. Balaji, E. McDonough, and D. I. Kaiser. "Planck constraints and gravitational wave forecasts for primordial black hole dark matter seeded by multifield inflation". *Phys. Rev. D*, 108(4):043508, 2023. [arXiv:2303.02168](https://arxiv.org/abs/2303.02168) [[astro-ph.CO](https://arxiv.org/archive/astro)]

- [7] **W. Qin**, K. Schutz, A. Smith, E. Garaldi, R. Kannan, T. R. Slatyer, and M. Vogelsberger. “An Effective bias expansion for 21-cm cosmology in redshift space”. *Phys. Rev. D*, 106(12):123506, 2022. [arXiv:2205.06270 \[astro-ph.CO\]](#)
- [6] S. R. Geller, **W. Qin**, E. McDonough, and D. I. Kaiser. “Primordial black holes from multifield inflation with nonminimal couplings”. *Phys. Rev. D*, 106(6):063535, 2022. [arXiv:2205.04471 \[hep-th\]](#)
- [5] * H. Liu, **W. Qin**, G. W. Ridgway, and T. R. Slatyer. “Lyman- α constraints on cosmic heating from dark matter annihilation and decay”. *Phys. Rev. D*, 104(4):043514, August 2021. [arXiv:2008.01084 \[astro-ph.CO\]](#)
- [4] **W. Qin**, K. K. Boddy, and M. Kamionkowski. “Subluminal stochastic gravitational waves in pulsar-timing arrays and astrometry”. *Phys. Rev. D*, 103(2):024045, January 2021. [arXiv:2007.11009 \[gr-qc\]](#)
- [3] **W. Qin**, K. K. Boddy, M. Kamionkowski, and L. Dai. “Pulsar-timing arrays, astrometry, and gravitational waves”. *Phys. Rev. D*, D99(6):063002, March 2019. [arXiv:1810.02369 \[astro-ph.CO\]](#)
- [2] **W. Qin**, D. M. Nataf, N. Zakamska, P. R. Wood, and L. Casagrande. “The Mira-based distance to the Galactic centre”. *The Astrophysical Journal*, 865(1):47, August 2018. [arXiv:1808.01294 \[astro-ph.SR\]](#)
- [1] CMS Collaboration (including **W. Qin**). “Search for a new scalar resonance decaying to a pair of Z bosons in proton-proton collisions at $\sqrt{s}=13$ TeV”. *Journal of High Energy Physics*, 6:127, June 2018. [arXiv:1804.01939 \[hep-ex\]](#)

INVITED SEMINARS

- 2023, Dec 4 · University of Toronto High-Energy Physics Seminar,
“Probing exotic energy injection with the CMB (power) spectrum and early star formation”
- 2023, Oct 3 · Princeton Dark Cosmos Seminar,
“Probing exotic energy injection with the CMB (power) spectrum and early star formation”
- 2023, Jul 20 · IPPP Durham Seminar,
“Probing exotic energy injection with the CMB (power) spectrum and early star formation”
- 2023, Jul 17 · Jodrell Bank Center for Astrophysics Special Cosmology Seminar,
“Probing exotic energy injection with the CMB (power) spectrum and early star formation”
- 2023, Apr 18 · Harvard & Smithsonian Center for Astrophysics Seminar,
“Cosmological probes of dark matter energy injection”

CONFERENCE PRESENTATIONS

- 2023, May 30 · Dark Matter, parallel talk,
“Probing exotic energy injection with CMB spectral distortions and early star formation”
- 2023, May 23 · PLANCK, parallel talk,
“Probing exotic energy injection with CMB spectral distortions and early star formation”
- 2023, May 9 · Pheno Symposium, parallel talk,
“An Effective Field Theory of 21 cm Radiation with Redshift Space Distortions”
- 2022, Aug 8 · TeVPA, parallel talk,
“An Effective Field Theory of 21 cm Radiation with Redshift Space Distortions”

- 2022, Jul 7 · ICHEP, parallel talk,
"Post-Recombination Spectral Distortions from Dark Matter Energy Injection"
- 2022, May 23 · EuCAPT Symposium, lightning talk,
"An Effective Field Theory of 21 cm Radiation with Redshift Space Distortions"
- 2022, May 10 · Pheno Symposium, parallel talk,
"Post-Recombination Spectral Distortions from Dark Matter Energy Injection"
- 2020, Aug 25 · Cosmology From Home, virtual parallel talk,
"Lyman-alpha constraints on Cosmic Heating from Dark Matter Annihilation and Decay"

INTERNAL TALKS

- 2023, Jul 13 · Cambridge University Cosmic Dawn group meeting,
"Probing exotic energy injection with the CMB (power) spectrum and early star formation"
- 2023, Apr 14 · MIT Center for Theoretical Physics, Dark Matter Journal Club,
"Cosmological probes of dark matter energy injection"
- 2023, Apr 10 · MIT Kavli Institute, Graduate Lunch Seminar,
"Cosmological probes of dark matter energy injection"
- 2022, Nov 15 · Technion Theory Group Meeting,
"Extending the Effective Field Theory of 21cm radiation"
- 2022, Oct 21 · MIT Center for Theoretical Physics, Graduate Lunch Seminar,
"Dark Matter at Cosmic Dawn: Probing BSM Physics with the 21 cm line"
- 2022, May 24 · Masui Group Meeting,
"Extending the Effective Field Theory of 21cm radiation"
- 2022, Feb 8 · HERA Theory Group Telecon,
"Extending the Effective Field Theory of 21cm radiation"
- 2021, Sep 28 · Harvard University, Particle Theory Journal Club,
"Introduction to 21cm Cosmology"
- 2021, May 14 · MIT Center for Theoretical Physics, BSM Journal Club,
"Redshift space distortions in an effective field theory of 21cm radiation"
- 2021, May 05 · MIT Kavli Institute, Graduate Lunch Seminar,
"Redshift space distortions in an effective field theory of 21cm radiation"
- 2020, Aug 14 · MIT Center for Theoretical Physics, BSM Journal Club,
"Lyman-alpha constraints on Cosmic Heating from Dark Matter Annihilation and Decay"
- 2019, Dec 04 · MIT Kavli Institute, Graduate Lunch Seminar,
"Pulsar timing arrays, astrometry, and gravitational waves"

PROFESSIONAL ACTIVITIES, WORKSHOPS, AND SCHOOLS

- 2023 · Journal Referee: Journal of High Energy Physics
- 2022 · Journal Referee: Journal of Cosmology and Astroparticle Physics
- 2022, Jun 6 - Jul 1 · TASI: Ten Years After the Higgs Discovery, Particle Physics Now and Future
- 2021, Jul 25 - Aug 20 · Les Houches Summer School: Dark Matter

COMMUNITY

- 2022 · Co-chair of MIT Graduates Advising Graduate Admissions
- 2022 · Co-organizer of the MIT Dark Matter Journal Club and Coffee Hour
 - Graduate Student Representative to MIT Graduate Admissions Committee (since 2020)
 - Mentor for MIT UWIP-GWIP mentorship program (since 2019)
- 2021 · Mentor for MIT Physics Directed Reading Program
 - Vice President of advocacy for the MIT Physics Graduate Student Council
- 2020 · Treasurer of the MIT Physics Graduate Student Council
 - Graduate Women in Physics Representative to MIT Department Colloquium Committee
 - Member of MIT Graduates Advising Graduate Admissions
- 2019 · Organizer for the MIT Center for Theoretical Physics Friday Lunch Seminar
 - Member of the Johns Hopkins team for the 2019 International Olympiad in Theoretical Physics; placed 1st overall
- 2018 · Founder of the Johns Hopkins Physics Undergraduate Journal Club
 - Member of the Johns Hopkins team for the 2018 International Olympiad in Theoretical Physics; placed 9th overall

TEACHING

- 2022 · Teaching Assistant at MIT (Modern Astrophysics 8.284)
- 2016-2018 · Teaching Assistant at Johns Hopkins University (General Physics 171.102 and 171.108)

August 27, 2023