



Rebecca K Leane

Staff Scientist, SLAC National Accelerator Laboratory

Professional

WORK EXPERIENCE

- Postdoctoral Researcher - MIT Center for Theoretical Physics (2017 - 2020)

Publications

PUBLICATIONS

- **Sub-GeV Dark Matter Direct Detection with Neutrino Observatories.** *Physical review letters*
Leane, R. K., Beacom, J. F.
2025; 135 (19): 191003
- **Dark branches of immortal stars at the Galactic Center** *PHYSICAL REVIEW D*
John, I., Leane, R. K., Linden, T.
2025; 112 (2)
- **Dark kinetic heating of exoplanets and brown dwarfs** *JOURNAL OF HIGH ENERGY PHYSICS*
Acevedo, J. F., Leane, R. K., Reilly, A. J.
2025
- **Optimal celestial bodies for dark matter detection** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
Leane, R. K., Tong, J.
2024
- **Transmon Qubit constraints on dark matter-nucleon scattering** *JOURNAL OF HIGH ENERGY PHYSICS*
Das, A., Kurinsky, N., Leane, R. K.
2024
- **Dark Matter halo parameters from overheated exoplanets via Bayesian hierarchical inference** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
Benito, M., Karchev, K., Leane, R. K., Poder, S., Smirnov, J., Trotta, R.
2024
- **Search for Dark Matter Ionization on the Night Side of Jupiter with Cassini.** *Physical review letters*
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- **Search for Dark Matter Ionization on the Night Side of Jupiter with Cassini** *PHYSICAL REVIEW LETTERS*
Blanco, C., Leane, R. K.
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- **Dark matter scattering constraints from observations of stars surrounding Sgr A*** *PHYSICAL REVIEW D*
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- **Evaporation barrier for dark matter in celestial bodies** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
Acevedo, J. F., Leane, R. K., Smirnov, J.
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- **Dark Matter Induced Power in Quantum Devices.** *Physical review letters*
Das, A., Kurinsky, N., Leane, R. K.
2024; 132 (12): 121801
- **Milky Way white dwarfs as sub-GeV to multi-TeV dark matter detectors** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
Acevedo, J. F., Leane, R. K., Santos-Olmsted, L.
2024
- **Detecting Dark Matter Induced Power in Quantum Devices**
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- **Dark matter capture in celestial objects: treatment across kinematic and interaction regimes** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
Leane, R. K., Smirnov, J.
2023
- **Snowmass2021 cosmic frontier white paper: Ultraheavy particle dark matter** *SCIPOST PHYSICS CORE*
Carney, D., Raj, N., Bai, Y., Berger, J., Blanco, C., Bramante, J., Cappelletto, C., Dutra, M., Ebadi, R., Engel, K., Kolb, E., Harding, J., Kumar, et al
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- **First Analysis of Jupiter in Gamma Rays and a New Search for Dark Matter.** *Physical review letters*
Leane, R. K., Linden, T.
2023; 131 (7): 071001
- **New approaches to dark matter detection** *NATURE REVIEWS PHYSICS*
Hochberg, Y., Kahn, Y. E., Leane, R. K., Rajendran, S., Van Tilburg, K., Yu, T., Zurek, K. M.
2022
- **Snowmass2021 theory frontier white paper: Astrophysical and cosmological probes of dark matter** *JOURNAL OF HIGH ENERGY ASTROPHYSICS*
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- **Tidal Love numbers of novel and admixed celestial objects** *Physical Review D*
Collier, M., Croon, D., Leane, R. K.
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- **Celestial-body focused dark matter annihilation throughout the Galaxy** *PHYSICAL REVIEW D*
Leane, R. K., Linden, T., Mukhopadhyay, P., Toro, N.
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- **Exoplanets as Sub-GeV Dark Matter Detectors** *PHYSICAL REVIEW LETTERS*
Leane, R. K., Smirnov, J.
2021; 126 (16): 161101
- **Supernova Muons: New Constraints on Z' Bosons, Axions and ALPs** *JOURNAL OF HIGH ENERGY PHYSICS*
Croon, D., Elor, G., Leane, R. K., McDermott, S. D.
2021
- **Spurious Point Source Signals in the Galactic Center Excess** *PHYSICAL REVIEW LETTERS*
Leane, R. K., Slatyer, T. R.
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- **The enigmatic Galactic Center excess: Spurious point sources and signal mismodeling** *PHYSICAL REVIEW D*
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- **A systematic study of hidden sector dark matter: application to the gamma-ray and antiproton excesses** *JOURNAL OF HIGH ENERGY PHYSICS*
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2020
- **Warming nuclear pasta with dark matter: kinetic and annihilation heating of neutron star crusts** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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- **Revival of the Dark Matter Hypothesis for the Galactic Center Gamma-Ray Excess** *PHYSICAL REVIEW LETTERS*
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- **Constraints on spin-dependent dark matter scattering with long-lived mediators from TeV observations of the Sun with HAWC** *PHYSICAL REVIEW D*
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- **GeV-scale thermal WIMPs: Not even slightly ruled out** *PHYSICAL REVIEW D*
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- **Enhancing dark matter annihilation rates with dark bremsstrahlung** *PHYSICAL REVIEW D*
Bell, N. F., Cai, Y., Dent, J. B., Leane, R. K., Weiler, T. J.
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- **Powerful solar signatures of long-lived dark mediators** *PHYSICAL REVIEW D*
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- **Impact of mass generation for spin-1 mediator simplified models** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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2017
- **Dark forces in the sky: signals from Z' and the dark Higgs** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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2016
- **Mono-W dark matter signals at the LHC: simplified model analysis** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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