Rebecca K. Leane

SLAC National Accelerator Laboratory
Stanford University
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Research Interests

Theoretical Particle and Astroparticle Physics, Physics Beyond the Standard Model

Expertise: Indirect Dark Matter Detection, New Dark Matter and Astroparticle Search Strategies, Intersection of Theory and Astrophysical Data for Dark Matter

Current Appointments

SLAC National Accelerator Laboratory 2021–Present
Stanford University

SLAC Particle Theory Group
Associate Staff Scientist (Tenure Track Equivalent)

Kavli Institute for Particle Astrophysics and Cosmology (KIPAC)
Senior Member

Previous Appointments

SLAC National Accelerator Laboratory, Stanford University 2020–2021
SLAC Particle Theory Group
Postdoctoral Research Associate

Massachusetts Institute of Technology 2017–2020
MIT Center for Theoretical Physics
Postdoctoral Research Associate

Education

University of Melbourne 2013–2017
Centre of Excellence for Particle Physics at the Terascale (CoEPP)
Ph.D. in Theoretical Particle Physics
Thesis Advisor: Prof. Nicole Bell

University of Cambridge 2012–2013
Department of Applied Mathematics and Theoretical Physics (DAMTP)
Master of Advanced Study in Mathematics (Part III of the Mathematical Tripos)
Essay Advisor: Prof. Ben Allanach

Monash University 2008–2011
Bachelor of Science Advanced with Honours
Majors: Physics and Mathematics. High Distinction.
Thesis Advisor: Prof. Csaba Balazs

Funded Grants

KIPAC Innovation Grant, $**42,000 USD** — 2022
Detecting Dark Matter in Exoplanets
Leane and Macintosh

NASA Fermi Guest Investigator Program, Cycle 12, $**70,000 USD** — 2019–2020
Characterizing Unresolved Point-Source Populations in the Inner Galaxy
Grant No. 80NSSC19K1515, **Leane** and Slatyer

Prizes, Awards & Scholarships

Chancellor's Prize for Excellence in the PhD Thesis, U. Melbourne	2018
Dean's Award for Excellence in Graduate Research, U. Melbourne	2018
Australian Government Research Training Program Scholarship	2017
Royal Society of Victoria Young Scientist Research Prize	2016
Science Abroad Travelling Scholarship	2016
Laby Foundation Early Career Researcher Travel Scholarship	2015
Australian Postgraduate Award (APA)	2012–2016
Monash Jubilee Honours Scholarship	2011
J. L. William Honours Scholarship	2011

Publications

inSPIRE profile and arXiv publication list
h-index: 25, total citations: 1,515 (from inSPIRE, 03/17/23)
*Asterisk indicates alphabetical order list (as per convention in theoretical particle physics).

Journal Articles:

37. J. Acevedo, **R. K. Leane***, J. Smirnov — 2023
Evaporation Barrier for Dark Matter in Celestial Bodies
[arXiv:2303.01516 [hep-ph]]
[0 citations]

36. A. Das, N. Kurinsky, **R. K. Leane*** — 2022
Dark Matter Induced Power in Quantum Devices
[arXiv:2210.09313 [hep-ph]]
[3 citations]

35. **R. K. Leane*** and J. Smirnov — 2022
Floating Dark Matter in Celestial Bodies
[arXiv:2209.09834 [hep-ph]]
[10 citations]

34. M. Collier, D. Croon, **R. K. Leane*** — 2022
Tidal Love Numbers of Novel and Admixed Celestial Objects
Phys. Rev. D 106, 123027 (2022), [arXiv:2205.15337 [gr-qc]]
[9 citations]

33. **R. K. Leane*** and T. Linden, 2021
First Analysis of Jupiter in Gamma Rays and a New Search for Dark Matter
Submitted to PRL, [arXiv:2104.02068 [astro-ph.HE]]
[29 citations]

32. **R. K. Leane***, T. Linden, P. Mukhopadhyay, N. Toro, 2021
Celestial-Body Focused Dark Matter Annihilation Throughout the Galaxy
Phys. Rev. D 103, 075030 (2021), [arXiv:2101.12213 [astro-ph.HE]]
[41 citations]

31. **R. K. Leane*** and J. Smirnov 2020
Exoplanets as Sub-GeV Dark Matter Detectors
Phys. Rev. Lett. 126, 161101 (2021), [arXiv:2010.00015 [hep-ph]]
Selected as PRL Editor's Suggestion, Featured in APS Physics
[51 citations]

30. D. Croon, G. Elor, **R. K. Leane***, S. McDermott 2020
Supernova Muons: New Constraints on Z' Bosons, Axions, and ALPs
JHEP 01 (2021) 107, [arXiv:2006.13942 [hep-ph]]
[75 citations]

29. **R. K. Leane*** and T. R. Slatyer 2020
Spurious Point Source Signals in the Galactic Center Excess
Phys. Rev. Lett. 125, 121105 (2020), [arXiv:2002.12370 [astro-ph.HE]]
[46 citations]

28. **R. K. Leane*** and T. R. Slatyer 2020
The Enigmatic Galactic Center Excess:
Spurious Point Sources and Signal Mismodeling
Phys. Rev. D 102, 063019 (2020), [arXiv:2002.12371[astro-ph.HE]]
[41 citations]

27. D. Hooper, **R. K. Leane***, Y. Tsai, S. Wegsman, S. Witte 2019
A Systematic Study of Hidden Sector Dark Matter:
Application to the Gamma-Ray and Antiproton Excesses
JHEP 07 (2020) 163, [arXiv:1912.08821 [hep-ph]]
[26 citations]

26. J. Acevedo, J. Bramante, **R. K. Leane***, N. Raj 2019
Cooking Pasta with Dark Matter:
Kinetic and Annihilation Heating of Neutron Star Crusts
JCAP 03 (2020) 038, [arXiv:1911.06334 [hep-ph]]
[60 citations]

25. **R. K. Leane*** and T. R. Slatyer 2019
Dark Matter Strikes Back at the Galactic Center
Phys. Rev. Lett. 123 (2019) 241101, [arXiv:1904.08430 [astro-ph.HE]]
Selected as PRL Editor's Suggestion, Featured in APS Physics
[102 citations]

24. HAWC Collaboration and 2018
J.F. Beacom, **R. K. Leane***, T. Linden, K. C.Y. Ng, A. Peter, B. Zhou
Constraints on Spin-Dependent Dark Matter Scattering
with Long-Lived Mediators from TeV Observations of the Sun with HAWC
Phys. Rev. D 98 (2018), 123012, [arXiv:1808.05624 [hep-ph]].
[58 citations]

23. HAWC Collaboration and 2018
J.F. Beacom, **R. K. Leane***, T. Linden, K. C.Y. Ng, A. Peter, B. Zhou
First HAWC Observations of the Sun Constrain Steady TeV Gamma-Ray Emission
Phys. Rev. D 98 (2018), 123011, [arXiv:1808.05620 [astro-ph.HE]]
[31 citations]

22. **R. K. Leane**, T. R. Slatyer, J. F. Beacom, K. C.Y. Ng 2018
GeV-Scale Thermal WIMPs: Not Even Slightly Dead
Phys. Rev. D98 (2018), 023016 [arXiv:1805.10305 [hep-ph]]
[150 citations]

21. N. F. Bell, Y. Cai, J. B. Dent, **R. K. Leane***, T. J. Weiler 2017
Enhancing Dark Matter Annihilation Rates with Dark Bremsstrahlung
Phys. Rev. D96 (2017), 023011 [arXiv:1705.01105 [hep-ph]]
[33 citations]

20. **R. K. Leane**, K. C.Y. Ng, J. F. Beacom 2017
Powerful Solar Signatures of Long-Lived Dark Mediators
Phys. Rev. D95 (2017), 123016 [arXiv:1703.04629 [astro-ph.HE]]
[81 citations]

19. N. F. Bell, Y. Cai, **R. K. Leane*** 2016
Impact of Mass Generation for Spin-1 Mediator Simplified Models
JCAP 01 (2017) 039 [arXiv:1610.03063 [hep-ph]]
[53 citations]

18. N. F. Bell, Y. Cai, **R. K. Leane*** 2016
Dark Forces in the Sky: Signals from Z' and the Dark Higgs
JCAP 08 (2016) 001 [arXiv:1605.09382 [hep-ph]]
[39 citations]

17. N. F. Bell, Y. Cai, **R. K. Leane*** 2015
Mono-W Dark Matter Signals at the LHC: Simplified Model Analysis
JCAP 01 (2016) 051 [arXiv:1512.00476 [hep-ph]]
[55 citations]

16. N. F. Bell, Y. Cai, J. B. Dent, **R. K. Leane***, T. J. Weiler 2015
Dark matter at the LHC: Effective field theories and gauge invariance
Phys. Rev. D92, 053008 (2015) [arXiv:1503.07874 [hep-ph]]
[76 citations]

15. N. F. Bell, Y. Cai, **R. K. Leane***, A. D. Medina 2014
Leptophilic dark matter with Z' interactions
Phys. Rev. D 90, 035027 (2014) [arXiv:1407.3001 [hep-ph]]
[68 citations]

Review Articles:

14. **R. K. Leane** 2020
Indirect Detection of Dark Matter in the Galaxy
[arXiv:2006.00513 [hep-ph]]
[36 citations]

Invited Viewpoint Articles:

13. Y. Hochberg, Y. Kahn, **R. K. Leane***, S. Rajendran,
K. Van Tilburg, T-T. Yu, K. Zurek 2022
New Approaches to Dark Matter Detection
Nature Reviews Physics (2022).
[3 citations]

White Papers and Working Group Reports:

12. J. Cooley, T. Lin, H. Lippincott, T. Slatyer, T. Yu et al (incl **R. K. Leane**) 2022
Report of the Topical Group on Particle Dark Matter for Snowmass 2021,
[arXiv:2209.07426 [hep-ph]]
Role: Report based in part on my Cosmic Frontier contributions.
[12 citations]

11. A. Drlica-Wagner, C. Prescod-Weinstein, H.-B. Yu et al (incl **R. K. Leane**) 2022
Report of the Topical Group on Cosmic Probes of Dark Matter for Snowmass 2021,
[arXiv:2209.08215 [hep-ph]]
Role: Report based in part on my Cosmic Frontier contributions.
[7 citations]

10. D, Green, J. Ruderman, B. Safdi, J. Shelton et al (incl **R. K. Leane**) 2022
Snowmass Theory Frontier: Astrophysics and Cosmology,
[arXiv:2209.06854 [hep-ph]]
Role: Report based in part on my Theory Frontier contributions.
[10 citations]

9. **R. K. Leane**, S. Shin, L. Yang, et al, 2022
Snowmass2021 Cosmic Frontier:
Puzzling excesses in dark matter searches and how to resolve them,
[arXiv:2203.06859 [hep-ph]]
Role: Paper coordinator/editor, and leader of the Galactic Center Excess section.
[17 citations]

8. L. Winslow, et al (incl **R. K. Leane**), 2022
Axion Dark Matter, [arXiv:2203.14923 [hep-ex]]
Role: Contributor to "Synergies with astrophysical searches" section.
[51 citations]

7. P. Harding, S. Horiuchi, D. Walker, et al (incl **R. K. Leane**), 2022
Snowmass2021 Cosmic Frontier:
Synergies between dark matter searches and multiwavelength/multimessenger astrophysics, [arXiv:2203.06781 [hep-ph]]
Role: Contributor to "Searches with Celestial Bodies" section.
[6 citations]

6. D. Carney, N. Raj, et al (incl **R. K. Leane**), 2022
Snowmass2021 Cosmic Frontier:
Ultra-heavy particle dark matter, [arXiv:2203.06508 [hep-ph]]
Role: Contributor to "Indirect Detection" section.
[29 citations]

5. M Baryakhtar, R. Caputo, D. Croon, K. Perez, et al (incl **R. K. Leane**), 2022
Dark Matter In Extreme Astrophysical Environments, [arXiv:2203.07984 [hep-ph]]
Role: Contributor to "Light Dark Matter" section.
[26 citations]

4. K. Boddy, M. Lisanti, S. McDermott, N. Rodd, 2022
C, Weniger, et al (incl **R. K. Leane**),
Astrophysical and Cosmological Probes of Dark Matter,
[arXiv:2203.06380 [hep-ph]]
Role: Contributor to "X-ray and γ-ray Dark Matter Signatures" section.
[28 citations]

3. T Aramaki, P. von Doetinchem, S. Profumo, et al (incl **R. K. Leane**), 2022
Snowmass2021 Cosmic Frontier:
The landscape of cosmic-ray and high-energy photon probes of particle dark matter,
[arXiv:2203.06894 [hep-ex]]
Role: Contributor to "Photon Probes" section.
[11 citations]

2. M. Un Nisa, J. F. Beacom, S. Y. BenZvi, 2019
R. K. Leane, T. Linden, K. C.Y. Ng, A. H.G. Peter, B. Zhou
The Sun at GeV-TeV Energies: A New Laboratory for Astroparticle Physics
Astro2020 Science White Paper (2019) [arXiv:1903.06349 [astro-ph.HE]]
Role: Contributor to text, content based in part on my solar dark matter search papers.
[25 citations]

1. G. Brooijmans et al (incl **R. K. Leane**) 2012
Les Houches 2011: Physics at TeV Colliders New Physics Working Group Report (2012) [arXiv:1203.1488 [hep-ph]]
Role: Contributor to text; "DLHA: Dark Matter Les Houches Agreement", is heavily based on my bachelor thesis.
[117 citations]

Talks

Summary: 14 invited colloquia, 14 invited plenary talks, 58 invited seminars, 27 additional conference/workshop talks (incl. additional 20 invited). Talks across Australia, Austria, Brazil, Canada, Germany, Guadeloupe, Italy, Japan, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States.

After PhD, average 20+ invited talks per year; declined invitations are not listed below.

Invited Plenary/Overview Talks and Colloquia:

106. Invited Plenary Talk, Pheno 2023, Pittsburgh PA, USA — May 2023
105. Invited Colloquium, University of Toronto, Toronto, Canada — Jan 2023
104. Invited Plenary Talk, TeVPA 2022, Kingston ON, Canada — Aug 2022
103. Invited Plenary Talk, Identification of DM 2022, Vienna, Austria — Jul 2022
102. Invited Colloquium, Snowmass Cosmic Frontier Meeting, Online — Jun 2022
101. Invited Overview Talk, HEP/Astro Results Forum, Online — May 2022
100. Invited Colloquium, Munich-Area Physics (TUM/LMU/MPI), Germany — May 2022
99. Invited Colloquium, SLAC, Menlo Park CA, USA — Feb 2022
98. Invited Colloquium, Carleton University, Ottawa, Canada — Dec 2021
97. Invited Colloquium, CERN, Geneva, Switzerland — Oct 2021
96. Invited Plenary Talk, Dark Matter 2021, Santander, Spain — Sep 2021
95. Invited Colloquium, North Carolina State U., Rayleigh NC, USA — Sep 2021
94. Invited Plenary Talk, EXPLORE workshop, Germany — Aug 2021
93. Invited Plenary Talk, Planck 2021, Durham, UK — Jun 2021
92. Invited Colloquium, Stockholm University, Stockholm, Sweden — May 2021
91. Invited Colloquium, University of Chicago KICP, Chicago IL, USA — May 2021
90. Invited Colloquium, University at Albany SUNY, Albany NY, USA — Mar 2021
89. Invited Colloquium, Northeastern University, Boston MA, USA — Feb 2021
88. Invited Plenary Talk, Light Dark World 2020, Sydney, Australia — Dec 2020
87. Invited Plenary Talk, Identification of DM 2020, Vienna, Austria — Jul 2020
86. Invited Plenary Talk, 3rd World Summit on EDSU, Guadeloupe — Mar 2020
85. Invited Colloquium, MIT, LNS, Cambridge MA, USA — Feb 2020
84. Invited Plenary Talk, DM@LHC 2019, Seattle WA, USA — Aug 2019
83. Invited Colloquium, University of Melbourne, Melbourne Australia — Dec 2018
82. Invited Plenary Talk, CAASTRO-CoEPP Joint Workshop, Australia — Jan 2017
81. Invited Plenary Talk, ATLAS Astroparticle Forum Meeting, CERN — Nov 2016

Invited Seminars and Other Conference Talks:

80. Invited Talk, Future Gamma Telescope Workshop, Chicago IL, USA — May 2023
79. Invited Symposium Speaker, APS April Conference, Minnesota, USA — Apr 2023
78. Invited Talk, Aspen Winter Conference, Aspen CO, USA — Mar 2023
77. Invited Talk, Stony Brook Simons Workshop, Stony Brook NY, USA — Mar 2023

76. Invited Seminar, McGill University, Montreal, Québec, Canada Nov 2022
75. Invited Seminar, Fermilab, Batavia IL, USA Oct 2022
74. Invited Seminar, University of Utah, Salt Lake City UT, USA Sep 2022
73. Invited Seminar, University of Hawaii, Manoa HI, USA May 2022
72. Invited Seminar, Stanford University, Stanford CA, USA Apr 2022
71. Invited Seminar, Kings College London, London, UK Mar 2022
70. Invited Seminar, University of Kentucky, Lexington KY, USA Mar 2022
69. Invited Talk, Bay Area Theoretical Physics Seminar, San Francisco CA Mar 2022
68. Invited Talk, FISICA 2022, Mainz, Germany Mar 2022
67. Invited Seminar, Rutgers University, Piscataway NJ, USA Dec 2021
66. Invited Seminar, Colgate University, Hamilton NY, USA Nov 2021
65. Invited Parallel Talk, PANIC 2021, Lisbon, Portugal Sep 2021
64. Invited Seminar, Max-Planck Institute, Heidelberg, Germany Jul 2021
63. Invited Seminar, UCLA, Los Angeles CA, USA Jun 2021
62. Invited Seminar, Imperial College London, London, UK Apr 2021
61. Invited Seminar, University of Torino, Torino, Italy Apr 2021
60. Invited Talk, Aspen Center for Physics Winter Conf., Aspen CO, USA Mar 2021
59. Invited Seminar, University of Notre Dame, Notre Dame IN, USA Mar 2021
58. Invited Seminar, Brookhaven National Laboratory, Upton NY, USA Feb 2021
57. Invited Seminar, Queen's University, Kingston ON, Canada Feb 2021
56. Invited Seminar, Stanford University, Stanford CA, USA Dec 2020
55. Invited Seminar, California Institute of Technology, Pasadena CA, USA Dec 2020
54. Invited Talk, 3rd South American DM Workshop, Brazil Dec 2020
53. Invited Seminar, UC Santa Cruz, Santa Cruz CA, USA Nov 2020
52. Invited Seminar, SLAC, Menlo Park CA, USA Nov 2020
51. Invited Talk, Snowmass CF-01 Group Meeting Aug 2020
50. Invited Seminar, Sydney CCPC, Sydney, Australia Aug 2020
49. Invited Seminar, Kavli IPMU, Tokyo, Japan May 2020
48. Parallel Talk, Pheno 2020, Pittsburgh PA, USA May 2020
47. Invited Talk, Astrophysical Signatures of DM Workshop, MI, USA May 2020
(canceled due to covid-19)
46. Invited Talk, Aspen Winter Conf. on Particle Physics, Aspen CO, USA Mar 2020
(canceled due to covid-19)
45. Invited Seminar, U. Mass Amherst, Amherst MA, USA Feb 2020
44. Invited Seminar, Tufts University, Medford MA, USA Feb 2020
43. Invited Seminar, Boston University, Boston MA, USA Nov 2019
42. Invited Seminar, SLAC, Menlo Park CA, USA Oct 2019
41. Invited Seminar, Texas A&M University, College Station TX, USA Oct 2019
40. Invited Seminar, MIT Center for Theoretical Physics, Camb. MA, USA Sep 2019

39. Invited Seminar, Perimeter Institute, Waterloo ON, Canada Jun 2019
38. Invited Talk, Aspen Center for Physics, Aspen CO, USA Jun 2019
37. Invited Seminar, KICP, University of Chicago, Chicago IL, USA Apr 2019
36. Invited Seminar, Brown University, Providence RI, USA Apr 2019
35. Invited Seminar, Fermilab, Batavia IL, USA Mar 2019
34. Invited Seminar, Brandeis University, Boston MA, USA Mar 2019
33. Invited Seminar, Princeton University, Princeton NJ, USA Feb 2019
32. Invited Talk, TRIUMF Dark Matter Workshop, Vancouver BC, Canada Feb 2019
31. Parallel Talk, DESY Theory Workshop, Hamburg, Germany Sep 2018
30. Invited Seminar, University of Melbourne, Melbourne VIC, Australia Sep 2018
29. Parallel Talk 1, IDM 2018, Providence RI, USA Jul 2018
28. Parallel Talk 2, IDM 2018, Providence RI, USA Jul 2018
27. Invited Parallel Talk, PASCOS 2018, Cleveland OH, USA Jun 2018
26. Parallel Talk, Pheno 2018 Symposium, Pittsburgh PA, USA May 2018
25. Invited Seminar, California Institute of Technology, Pasadena CA, USA Apr 2018
24. Invited Seminar, LBNL, Berkeley CA, USA Apr 2018
23. Invited Seminar, University of Michigan, Ann Arbor MI, USA Apr 2018
22. Invited Seminar, Dartmouth University, Hanover NH, USA Apr 2018
21. Invited Seminar, University of Melbourne, Melbourne VIC, Australia Jan 2018
20. Invited Seminar, MIT Center for Theoretical Physics, Camb. MA, USA Sep 2017
19. PhD Completion Seminar, University of Melbourne, Australia Mar 2017
18. Invited Seminar, TRIUMF, Vancouver BC, Canada (remote) Dec 2016
17. Invited Talk, CETUP Dark Matter Workshop, Deadwood SD, USA Jul 2016
16. Invited Seminar, University of Cincinnati, Cincinnati OH, USA May 2016
15. Invited Seminar, CCAPP, Ohio State University, Columbus OH, USA Jun 2016
14. Invited Seminar, UC Riverside, Riverside CA, USA May 2016
13. Invited Seminar, UC Irvine, Irvine CA, USA May 2016
12. Parallel Talk, Pheno 2016 Symposium, Pittsburgh PA, USA May 2016
11. Invited Seminar, University of Melbourne, Melbourne VIC, Australia Apr 2016
10. Invited Seminar, SLAC, Menlo Park CA, USA Oct 2015
9. Invited Seminar, CCAPP, Ohio State University, Columbus OH, USA Oct 2015
8. Invited Seminar, Fermilab, Batavia IL, USA Sep 2015
7. Invited Seminar, Vanderbilt University, Nashville TN, USA Sep 2015
6. Invited Seminar, University of Melbourne, Melbourne VIC, Australia Aug 2015
5. Parallel Talk, SUSY 2015, Lake Tahoe CA, USA Aug 2015
4. Invited Seminar, University of Melbourne, Melbourne VIC, Australia May 2015
3. Parallel Talk, CoSPA2014, Auckland, New Zealand Dec 2014
2. Contributed Talk, RESCEU APCosPA School, Matsumoto, Japan Jul 2014
1. Invited Seminar, University of Cambridge, Cambridge, UK Jun 2013

Outreach & Press

Interview, *New Scientist*, 2022
Earth's Surface May Be Teeming with Trillions of Dark Matter Particles
Video Interview (∼ 8K views), *Universe Today*, 2021
Interview with Dr. Rebecca K. Leane, Detecting Dark Matter
Interview, *SLAC News*, 2021
How Exoplanets Could Aid the Search for Dark Matter
Interview, *Universe Today*, 2021
Jupiter Could Make an Ideal Dark Matter Detector
Press Piece, *APS Physics*, 2021
Detecting Dark Matter in Exoplanets
Interview, *Science Magazine*, 2021
Dark Matter Could Warm the Hearts of Lonely Old Planets, Scientists Predict
Interview, *Wired Magazine*, 2021
Where's the Dark Matter? Look for Suspiciously Warm Planets
Interview, *Quanta Magazine*, 2020
Physicists are Expanding the Search for Dark Matter
Interview, *The Boston Globe Newspaper*, 2019
MIT scientists find DM could be cause of mysterious energy at the center of our galaxy
Interview, *MIT News*, 2019
Is there dark matter at the center of the Milky Way?
Press Piece, *APS Physics*, 2019
New Hope for Milky-Way Dark Matter
Interview, *Gizmodo*, 2019
The Future of Particle Physics Is Bright, Bleak, and Magical
Interview, *Quanta Magazine*, 2019
Dark Matter Gets a Reprieve in New Analysis
Interview, *Kavli Foundation*, 2019
Dark Matter is Back
Interview, *Science Magazine*, 2019
Physicists Revive Hunt for Dark Matter in the Heart of the Milky Way
Interview, *Popular Mechanics*, 2019
Filling the Void: What is Dark Matter?

Open House Talk, MIT Center for Theoretical Physics, Cambridge MA, USA 2018
Young Scientist Research Prize Talk, Royal Society of Victoria, Australia 2016

Key Scientific Researcher on International Science Documentary Series 2014–2015
"Uranium: Twisting the Dragon's Tail"
Worked with Emmy Award winning producer Sonya Pemberton and writer Wain Fimeri part time in a paid role over 12 months. Had a major role explaining the science content and developing the script for the series. Aired worldwide and won numerous science communication and film awards.

Public Talk, Strathcona Girls' School, Australia 2014
Panel Member, National Science Week: Kids Ask Questions, Australia 2013
Panel Member, National Science Week: Ask a Scientist, Australia 2013
Public Talk, Monash University Open Day Seminar Series, Australia 2011

High impact papers on Altmetric (stats as of 06/14/21):

- "Exoplanets as Sub-GeV Dark Matter Detectors" (2021) paper w/ Juri Smirnov: Altmetric Score of 435, ranked #49 of all time for media coverage of PRL outputs
- "Dark Matter Strikes Back at the Galactic Center" (2019) paper w/ Tracy Slatyer: Altmetric Score of 327, ranked #91 of all time for media coverage of PRL outputs

Teaching

Invited Lecturer, Dark Matter Theory Lectures, SLAC Summer Institute	2022
Invited Lecturer, EXPLORE2021 Summer School Workshop	2021
Guest Lecturer for MIT graduate course *8.811: Particle Physics II*	2017
Lecture Title: "Dark Matter Model Building"	
ATLAS International Masterclass Tutor, U. Melbourne	2015
Physics Teaching Assistant (Tutorials, Grading, Office Hours), U. Melbourne	2014
Physics Teaching Assistant (Lab Demonstrator, Grading), U. Melbourne	2012
Physics Teaching Assistant (Lab Demonstrator, Grading), Monash U.	2011
High School Tutoring, Physics and Mathematics	2008–2010

Mentoring & Supervising

SLAC Postdoctoral Researchers:

Javier Acevedo	2022–

PhD Students:

Stanford Thesis Advising:

Joshua Tong	2022–

Other Mentoring:

Lillian Santos-Olmsted, Stanford (Rotation Advisor)	Fall 2022
Joshua Tong, Stanford (Rotation Advisor)	Winter 2022
Payel Mukhopadhyay, Stanford (→ Postdoc at Berkeley)	2020–2021

Undergraduate Students:

Afura Taylor, MIT (→ PhD at Princeton)	2020–2021

Stanford/slac Service

SLAC Panofsky Fellowship Search Committee	2022–23
Stanford Physics Graduate Admissions, Astrophysics Committee	2022–23
Dark Matter Topical Lead for DOE HEP Institutional Review of SLAC	2022
Stanford Physics, Identity, and Equity (PIE) Program Invited Speaker	2022
SLAC Particle Theory Graduate Spring Open House Co-ordinator	2022
Stanford Selection Committee for CAMPARE/Leadership Alliance Programs	2022
Stanford Physics Graduate Admissions, Astrophysics Committee	2021–22
Stanford Physics Recruitment Committee	2021–22
Stanford Physics, Identity, and Equity (PIE) Program Invited Speaker	2021
Stanford Graduate Student Orientation: SLAC Theoretical Physics Overview Talk	2021
SLAC Particle Theory Postdoc Selection Committee	2021–
SLAC Particle Theory Website Maintenance	2021–
SLAC Dark Matter Meetings/Journal Club Founding Organizer	2021–

Stanford Physics PhD Dissertation Committee Examiner:

- David Cyncynates (advisor: Savas Dimopoulos) 2022

Reviewing

Institution Reviewing:

- US Department of Energy (DOE) University Comparative Review Panel 2023

Grant Reviewing:

- US Department of Energy (DOE) 2023–
- Natural Sciences and Engineering Research Council of Canada (NSERC) 2022–
- MIT Heising-Simons Physics Research Fellowship Review Panel 2018

Journal Referee:

- Physical Review Journals (PRL, PRD) 2019–
- Journal of High Energy Physics (JHEP) 2021–
- Journal of Cosmology and Astroparticle Physics (JCAP) 2021–
- SciPost Physics 2020–

Community

Invited Viewpoint Article Contributor in Nature Physics Reviews, 2022
"New Approaches to Dark Matter Detection" (see publications)

Coordinator, Editor, and Author 2021–2022
Snowmass Cosmic Frontier CF01 White Paper:
"Puzzling Excesses in Dark Matter Searches and How to Resolve Them"

Contributor to 6 Cosmic Frontier Snowmass White Papers (see publications) 2022
Contributor to 1 Theory Frontier Snowmass White Paper (see publications) 2022
Coordinator/Principal Author of Two Snowmass Letters of Interest 2020
Understanding the Galactic Center Gamma-Ray Excess: Observational Prospects
Understanding the Galactic Center Gamma-Ray Excess: Theory Prospects
Submitted to Cosmic Frontier and Theory Frontier Snowmass Working Groups

Convener/Chair, Plenary Session, TeV Particle Astrophysics (TeVPA) Conference 2022
Particle Theory Seminar Organizer, MIT Center for Theoretical Physics 2018–2020
Convener, Dark Matter Session, TeV Particle Astrophysics (TeVPA) Conference 2019