

Lina Necib

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Kavli Institute for Astrophysics and Space Research
Massachusetts Institute of Technology
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EMPLOYMENT

Assistant Professor of Physics Massachusetts Institute of Technology	2021– Present
Postdoctoral Fellow Carnegie Observatories	2020– 2021
University of California Presidential Fellow University of California, Irvine	2020– 2020
Sherman Fairchild Postdoctoral Fellow California Institute of Technology	2017 – 2020

EDUCATION

Doctor of Philosophy – Massachusetts Institute of Technology Theoretical High Energy Physics Advisor: Prof. Jesse Thaler Thesis Title: Boosting Searches for Dark Matter	2012 – 2017
Bachelor of Arts in Physics and Mathematics – Boston University	2008 – 2012

AWARDS

George E. Valley, Jr. Prize American Physical Society	2023
University of California Presidential Fellowship University of California Irvine	2020
Sherman Fairchild Postdoctoral Fellowship California Institute of Technology	2020
Sherman Fairchild Postdoctoral Fellowship California Institute of Technology	2017
Sergio Vazquez Prize Massachusetts Institute of Technology	2016
Praecis Presidential Graduate Fellowship Massachusetts Institute of Technology	2012
Alumni Prize for Excellence in Physics Boston University	2012
Phi Beta Kappa Boston University	2012
College Scholar Boston University	2011
Dean's List Boston University	2009–2012

TOP 5 PUBLICATIONS, H-INDEX:21

Author list in theoretical high energy physics is ordered alphabetically, while that of astronomy is ordered by contribution. For clarity, the lead author is designated by a †.

- 1) Ian Mould, **Lina Necib**†, Jesse Thaler.
New Angles on Energy Correlation Functions.
Citations: 234
JHEP 1612, no. 153
ARXIV:1609.07483
- 2) Kaustubh Agashe, Yanou Cui, **Lina Necib**†, Jesse Thaler.
(In)direct Detection of Boosted Dark Matter.
Citations: 156
JCAP 1410, no. 062
ARXIV:1405.7370
- 3) **Lina Necib**†, Mariangela Lisanti, Vasily Belokurov.
Inferred Evidence for Dark Matter Kinematic Substructure with SDSS-Gaia.
Citations: 107
ApJ 874, no.3, 22
ARXIV:1807.02519
- 4) Mariangela Lisanti, Siddharth Mishra-Sharma†, **Lina Necib**, Benjamin R. Safdi.
Deciphering Contributions to the Extragalactic Gamma-Ray Background from 2 GeV to 2 TeV.
Citations: 77
ApJ 832, no.2, 117
ARXIV:1606.04101
- 5) Jonah Herzog-Arbeitman, Mariangela Lisanti, Piero Madau, **Lina Necib**†.
Empirical Determination of Dark Matter Velocities using Metal-Poor Stars.
Citations: 70
Phys.Rev.Lett 120, no.4, 041102
ARXIV:1704.04499

MENTORING

Postdoctoral Associates

- *Dr. Nora Shipp*, FALL 2021-SUMMER 2023.
After MIT: NSF Fellowship at CMU, and Assistant Professor at the University of Washington starting 2024.

PhD Students

- *Tri Nguyen*, Expected graduation: Spring 2024.
- *Xiaowei Ou*, Expected graduation: Spring 2025.
- *Xiuyuan Zhang*, Expected graduation: Spring 2026.
- *Abdelaziz Hussein*, Expected graduation Spring 2027.

Undergraduate Students

- *Kate Habich*, FALL 2021, Expected graduation: Spring 2022.
- *Peter M Berggren*, SPRING 2022 & SUMMER 2022, Expected graduation: Spring 2025.
- *Hang Su*, (MSRP) SUMMER 2022-SPRING 2023, Expected graduation: Spring 2023.
- *Marina Malta Nogueira*, SPRING 2023, Expected graduation: Spring 2026.
- *Zeineb Mezghanni*, (MSRP) SUMMER 2023-FALL 2023, Expected graduation: Spring 2025.
- *Anna Orgel*, SUMMER 2023, Expected graduation: Spring 2025.
- *Hanna Chen*, SUMMER 2023-FALL 2023, Expected graduation: Spring 2026.

High School Students

- *Michael Huang*, (RSI) SUMMER 2022 & FALL 2022, Expected graduation: Spring 2023.

PUBLICATIONS

Student led papers are designated by underlying the student lead author. Author list in theoretical high energy physics is ordered alphabetically (not reflecting relative contributions to the paper), unless indicated otherwise with †. For alphabetically ordered papers, the lead author is designated by a ‡.

- 29[†]) Tri Nguyen, Xiaowei Ou, Nondh Panithanpaisal, Nora Shipp, **Lina Necib**,
Robyn Sanderson, Andrew Wetzel
Synthetic Gaia DR3 surveys from the FIRE cosmological simulations of Milky-Way-mass galaxies Submitted to ApJ
ARXIV:2306.16475
- 28[†]) Xiaowei Ou, Anna-Christina Eilers, **Lina Necib**, Anna Frebel
The Dark Matter Profile of the Milky Way Inferred from its Circular Velocity Curve Submitted to MNRAS
ARXIV:2303.12838
- 27[†]) David Shih, Matthew Buckley, **Lina Necib**
Via Machinae 2.0: Full-Sky, Model-Agnostic Search for Stellar Streams in Gaia DR2 Submitted to MNRAS
ARXIV:2303.01529
- 26[†]) Shuyu Wang, **Lina Necib**, Alexander P. Ji, Xiaowei Ou, Mariangela Lisanti,
Mithi A.C. de los Reyes, Allison L. Strom, Mimi Truong
High-Resolution Chemical Abundances of the Nyx Stream Submitted to ApJ
ARXIV:2210.15013
- 25[†]) Tri Nguyen, Siddharth Mishra-Sharma, Reuel Williams, **Lina Necib**
Uncovering dark matter density profiles in dwarf galaxies with graph neural networks Phys.Rev.D 107 no.4, 043015
ARXIV:2208.12825
- 24[†]) Nora Shipp, Nondh, Panithanpaisal, **Lina Necib**, Robyn Sanderson
Denis Erkal, Ting S. Li, Isaiah B. Santistevan, Andrew Wetzel, Lara R. Cullinane,
Alexander P. Ji, Sergey E. Koposov, Kyler Kuehn, Geraint F. ; Lewis; Andrew B. Pace; Daniel B. Zucker
Joss Bland-Hawthorn, Emily C. Cunningham, Stacy Y. Kim, Sophia Lilleengen, Jorge Moreno, Sanjib
Sharma
Streams on FIRE: Populations of Detectable Stellar Streams in the Milky Way and FIRE ApJ 949 no.2, 44
ARXIV:2208.02255
- 23[†]) Xiaowei Ou, **Lina Necib**, Anna Frebel
Robust Clustering of the Local Milky Way Stellar Kinematic Substructures with Gaia eDR3 MNRAS 521 no.2, 2623
ARXIV:2208.01056
- 22[†]) Xuejian Shen, Philip F. Hopkins, **Lina Necib**, Fangzhou Jiang,
Michael Boylan-Kolchin, Andrew Wetzel
Dissipative Dark Matter on FIRE: II. Observational signatures and constraints from local dwarf galaxies Submitted to MNRAS
ARXIV:2206.05327
- 21[†]) David Shih, Matthew R. Buckley, **Lina Necib**, John Tamanas
Via Machinae: Searching for Stellar Streams using Unsupervised Machine Learning MNRAS 509 no.4, 5992
ARXIV:2104.12789
- 20[†]) Xuejian Shen, Philip F. Hopkins, **Lina Necib**, Fangzhou Jiang,
Michael Boylan-Kolchin, Andrew Wetzel
Dissipative Dark Matter on FIRE: I. Structural and kinematic properties of dwarf galaxies MNRAS 506 no.3, 4421
ARXIV:2102.09580
- 19[†]) **Lina Necib**, Tongyan Lin
Substructure at High Speed II: The Local Escape Velocity and Milky Way Mass with Gaia eDR3 ApJ 926 no.2, 189
ARXIV:2102.02211
- 18[†]) **Lina Necib**, Tongyan Lin
Substructure at High Speed I: Inferring the Escape Velocity in the Presence of Kinematic Substructure ApJ 926 no.2, 188
ARXIV:2102.01704

- 17[†]) Laura J. Chang, **Lina Necib**
Dark Matter Density Profiles in Dwarf Galaxies: Linking Jeans Modeling Systematics and Observation. MNRAS 507 no.4, 4715
ARXIV:2009.00613
- 16) Joshua Berger[‡], Yanou Cui, Matthew Graham, **Lina Necib**,
Gianluca Petrillo, Dane Stocks, Yun-Tse Tsai, Yue Zhao.
Prospects for Detecting Boosted Dark Matter in DUNE through Hadronic Interactions. Phys.Rev.D 103 no.9, 095012
ARXIV:1912.05558
- 15[†]) **Lina Necib**, Bryan Ostdiek, Mariangela Lisanti,
Timothy Cohen, Marat Freytsis, Shea Garrison-Kimmel.
Chasing Accreted Structures within Gaia DR2 using Deep Learning. ApJ 903 no.1, 25
ARXIV:1907.07681
- 14[†]) **Lina Necib**, Bryan Ostdiek, Mariangela Lisanti,
Timothy Cohen, Marat Freytsis, Shea Garrison-Kimmel, Philip F. Hopkins,
Andrew Wetzel, Robyn Sanderson.
Evidence for a Vast Prograde Stellar Stream in the Solar Vicinity. Nature Astronomy (2020)
ARXIV:1907.07190
- 13[†]) Bryan Ostdiek, **Lina Necib**, Timothy Cohen,
Marat Freytsis, Mariangela Lisanti, Shea Garrison-Kimmel,
Andrew Wetzel, Robyn E. Sanderson, Philip F. Hopkins.
Cataloging Accreted Stars within Gaia DR2 using Deep Learning. A&A 636 A75
ARXIV:1907.06652
- 12[†]) **Lina Necib**, Mariangela Lisanti, Shea Garrison-Kimmel,
Andrew Wetzel, Robyn Sanderson, Philip F. Hopkins,
Claude-André Faucher-Giguère, Dušan Kereš.
Under the Firelight: Stellar Tracers of the Local Dark Matter Velocity Distribution in the Milky Way. ApJ 883 no.1, 27
ARXIV:1810.12301
- 11[†]) **Lina Necib**, Mariangela Lisanti, Vasily Belokurov.
Inferred Evidence for Dark Matter Kinematic Substructure with SDSS-Gaia. ApJ 874 no.3, 22
ARXIV:1807.02519
- 10) Frédéric A. Dreyer[‡], **Lina Necib**, Gregory Soyeze, Jesse Thaler.
Recursive Softdrop. JHEP 1806 093/ARXIV:1804.03657
- 9) Jonah Herzog-Arbeitman, Mariangela Lisanti, **Lina Necib**[‡].
The Metal-Poor Stellar Halo in RAVE-TGAS and its Implications for the Velocity Distribution of Dark Matter. JCAP 1804 052/ARXIV:1708.03635
- 8) Gordan Krnjaic[‡], Pedro A. N. Machado, **Lina Necib**.
Distorted Neutrino Oscillations From Ultralight Scalar Dark Matter. Phys.Rev. D 97 no.7, 075017
ARXIV:1705.06740
- 7) Jonah Herzog-Arbeitman, Mariangela Lisanti, Piero Madau, **Lina Necib**[‡].
Empirical Determination of Dark Matter Velocities using Metal-Poor Stars. Phys.Rev.Lett 120 no.4, 041102
ARXIV:1704.04499
- 6[†]) **Lina Necib**, Jarrett Moon, Taritree Wongjirad, Janet Conrad.
Boosted Dark Matter at Neutrino Experiments. Phys.Rev. D 95 no.7, 075018
ARXIV:1610.03486
- 5) Ian Mould, **Lina Necib**[‡], Jesse Thaler.
New Angles on Energy Correlation Functions. JHEP 1612 153
ARXIV:1609.07483

- 4) Mariangela Lisanti, Siddharth Mishra-Sharma[‡], **Lina Necib**, Benjamin R. Safdi. *Deciphering Contributions to the Extragalactic Gamma-Ray Background from 2 GeV to 2 TeV.* ApJ 832 no.2, 117
ARXIV:1606.04101
- 3) Nicolas Bernal, **Lina Necib**[‡], Tracy R. Slatyer. *Spherical Cows in Dark Matter Indirect Detection.* JCAP 1612 no. 030
ARXIV:1606.00433
- 2) Nayara Fonseca, **Lina Necib**[‡], Jesse Thaler. *Dark Matter, Shared Asymmetries, and Galactic Gamma Ray Signals.* JCAP 1602, no. 052
ARXIV:1507.08295
- 1) Kaustubh Agashe, Yanou Cui, **Lina Necib**[‡], Jesse Thaler. *(In)direct Detection of Boosted Dark Matter.* JCAP 1410, no. 062
ARXIV:1405.7370

N-TH AUTHOR PAPERS

- 12) Danny Horta, Emily C. Cunningham, Robyn E. Sanderson, Kathryn V. Johnston, Alis Deaon, Andrew Wetzel, Fiona McClusky, Nicolas Garavito-Camargo, **Lina Necib**, Claude-André Faucher-Giguère, Arpit Arora, Pratik J. Gandhi. *The proto-galaxy of Milky Way-mass haloes in the FIRE simulations* Submitted to MNRAS
ARXIV:2307.15741
- 11) Danny Horta, Emily C. Cunningham, Robyn E. Sanderson, Kathryn V. Johnston, Nondh Panithanpaisal, Arpit Arora, **Lina Necib**, Andrew Wetzel, Jeremy Bailin, Claude-André Faucher-Giguère. *The observable properties of galaxy accretion events in Milky Way-like galaxies in the FIRE-2 cosmological simulations* Submitted to MNRAS
ARXIV:2211.05799
- 10) Philip F. Hopkins, Andrew Wetzel, ..., **Lina Necib**, et al. *FIRE-3: Updated Stellar Evolution Models, Yields, & Microphysics and Fitting Functions for Applications in Galaxy Simulations* MNRAS 519, no.2, 2
ARXIV:2203.00040
- 9) Henrique Reggiani, Alexander P. Ji, Kevin C. Schlaufman, Anna Frebel, **Lina Necib**, Tyler Nelson, Keith Hawkins, Jhon Yana Galarza. *The Chemical Composition of Extreme-Velocity Stars* AJ 163, no. 6 252
ARXIV:2203.16364
- 8) Daniel McKeown, James S. Bullock, Francisco J. Mercado, Zachary Hafen, Michael Boylan-Kolchin, Andrew Wetzel, **Lina Necib**, Philip F. Hopkins, Sijie Yu. *Amplified f -factors in the Galactic Center for velocity-dependent dark matter annihilation in FIRE simulations* MNRAS 513 no.1, 55
ARXIV:2111.03076
- 7) Arka Banerjee, Kimberly K. Boddy, ..., **Lina Necib**, et al. *Snowmass2021 Cosmic Frontier White Paper: Cosmological Simulations for Dark Matter Physics* ARXIV:2203.07049
- 6) Shin'ichiro Ando, Sebastian Baum, ..., **Lina Necib**, et al. *Snowmass2021 Cosmic Frontier: Synergies between dark matter searches and multiwavelength/multimessenger astrophysics* ARXIV:2203.06781
- 5) Anirudh Chiti, Anna Frebel, Joshua D. Simon, Denis Erkal, Laura J. Chang, **Lina Necib**, Alexander P. Ji, Helmut Jerjen, Dongwon Kim, John E. Norris. *An Extended Halo Around an Ancient Dwarf Galaxy.* Nature Astronomy (2021)
ARXIV:2012.02309
- 4) Carine Babusiaux, Maria Bergemann, Adam Burgasser, ..., **Lina Necib**, et al. *The Detailed Science Case for the Maunakea Spectroscopic Explorer* ARXIV:1904.04907
- 3) Keith Bechtol, Alex Drlica-Wagner, Kevork N. Abazajian, ..., **Lina Necib**, et al. *Dark Matter Science in the Era of LSST* ARXIV:1903.04425

2) Keith Bechtol, Adam S. Bolton, Jo Bovy, ..., **Lina Necib**, et al.
Astrophysical Tests of Dark Matter with Maunakea Spectroscopic Explorer ARXIV:1903.03155

1) Alex Drlica-Wagner, Yao-Yuan Mao, ..., **Lina Necib**, et al.
Probing the Fundamental Nature of Dark Matter with the Large Synoptic Survey Telescope ARXIV:1902.01055

COLLOQUIA

Shining Light on Dark Matter APRIL 24, 2023
Cornell Physics Colloquium

Tracing Dark Matter with Stars FEBRUARY 8, 2023
UMass Boston Physics Colloquium

Searching for the Dark with the Light NOVEMBER 23, 2022
Latin-American Webinars in Physics

Tracing Dark Matter with Stars around the Milky Way SEPTEMBER 30, 2022
Dartmouth Physics Colloquium

Searching for the Dark with the Light: Stars as Tracers of Dark Matter MARCH 31, 2022
MIT Physics Colloquium

Tracing Dark Matter with Stars OCTOBER 2021
Brown University Physics Colloquium

Tracing Dark Matter with Stars OCTOBER 2021
University of Heidelberg Colloquium

Tracing Dark Matter with Stars SEPTEMBER 2021
Boston University Physics Colloquium

Tracing Dark Matter with Stars JUNE 2021
Carnegie Observatories Colloquium

Tracing Dark Matter with Stars FEBRUARY 2021
Southern Methodist University Physics Colloquium

Dark Matter in the Era of *Gaia* OCTOBER 2020
University of Indiana Physics Colloquium

Dark Matter in the Era of *Gaia* SEPTEMBER 2020
Emory University Physics Colloquium

Dark Matter in the Era of *Gaia* JULY 2020
KIPAC Stanford Astrophysics Colloquium

Dark Matter in the Era of *Gaia* DECEMBER 2019
Carnegie Observatories Colloquium

Dark Matter in the Era of *Gaia* SEPTEMBER 2019
MIT Astronomy Colloquium

Dark Matter in the Era of *Gaia* MAY 2019
California Institute of Technology Physics Colloquium

SEMINAR TALKS

(Machine) Learning of Dark Matter <i>Rutgers University</i>	SEPTEMBER 5, 2023
(Machine) Learning of Dark Matter <i>Princeton University</i>	APRIL 21, 2023
Searching for the Dark with the Light: Stars as Tracers of Dark Matter <i>University of Southern California</i>	OCTOBER 28, 2022
Tracing Dark Matter with Stars <i>Brookhaven National Laboratory</i>	APRIL 21, 2022
Tracing Dark Matter with Stars <i>University of California Berkeley/LBNL seminar</i>	FEBRUARY 2022
Tracing Dark Matter with Stars <i>Kavli IPMU, University of Tokyo</i>	NOVEMBER 2021
Tracing Dark Matter with Stars <i>Harvard University</i>	OCTOBER 2021
Tracing Dark Matter with Stars, Part II <i>SLAC</i>	JUNE 2021
Tracing Dark Matter with Stars <i>TRIUMF</i>	MARCH 2021
Tracing Dark Matter with Stars <i>SLAC</i>	FEBRUARY 2021
Tracing Dark Matter with Stars <i>Queen University</i>	JANUARY 2021
Tracing Dark Matter with Stars <i>University of Texas Austin</i>	DECEMBER 2020
Dark Matter in the Era of <i>Gaia</i> <i>Tsung-Dao Lee Institute</i>	DECEMBER 2020
Dark Matter in the Era of <i>Gaia</i> <i>Colorado University, Boulder</i>	OCTOBER 2020
Tracing Dark Matter with Stars <i>Virginia Tech</i>	SEPTEMBER 2020
Tracing Dark Matter with Stars <i>Fermilab</i>	JULY 2020
Dark Matter in the Era of <i>Gaia</i> <i>University of California Irvine</i>	APRIL 2020
Dark Matter in the Era of <i>Gaia</i> <i>University of Surrey</i>	JANUARY 2020

Dark Matter in the Era of <i>Gaia</i> <i>Perimeter Institute</i>	OCTOBER 2019
Dark Matter in the Era of <i>Gaia</i> <i>Harvard University</i>	OCTOBER 2019
Dark Matter in the Era of <i>Gaia</i> <i>Boston University</i>	SEPTEMBER 2019
Properties of Dark Matter in the Era of <i>Gaia</i> <i>LHC Results Forum</i>	SEPTEMBER 2019
Dark Matter in the Era of <i>Gaia</i> <i>Fermilab</i>	SEPTEMBER 2019
Dark Matter in the Era of <i>Gaia</i> <i>Texas A&M</i>	SEPTEMBER 2019
Dark Matter in the Era of <i>Gaia</i> <i>Ohio State University</i>	JULY 2019
Dark Matter in the Era of <i>Gaia</i> <i>Los Alamos National Laboratory</i>	MAY 2019
The Stellar Local Velocity Distribution and its Implications for Dark Matter <i>California Institute of Technology</i>	APRIL 2019
Dark Matter in Disequilibrium and Implications for Direct Detection <i>University of California Irvine</i>	MARCH 2019
Dark Matter in Disequilibrium and Implications for Direct Detection <i>SLAC</i>	JANUARY 2019
Dark Matter in Disequilibrium and Implications for Direct Detection <i>University of California Santa Barbara</i>	DECEMBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>John's Hopkins University</i>	DECEMBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>University of Maryland</i>	DECEMBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>KICP, University of Chicago</i>	NOVEMBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>Lawrence Berkeley National Laboratory</i>	NOVEMBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>Rutgers University</i>	OCTOBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>University of Kentucky</i>	OCTOBER 2018
Dark Matter in Disequilibrium and Implications for Direct Detection <i>SuperCDMS Collaboration</i>	SEPTEMBER 2018

Dark Matter in Disequilibrium: The Velocity Distribution <i>Fermilab</i>	JUNE 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>University of California San Diego</i>	MAY 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>Princeton University</i>	MARCH 2018
Boosted Dark Matter in Neutrino Experiments <i>Brookhaven National Laboratory</i>	MARCH 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>Brookhaven National Laboratory</i>	MARCH 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>New York University</i>	MARCH 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>University of Michigan Ann Arbor</i>	MARCH 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>Rutgers University</i>	FEBRUARY 2018
Empirical Determination of the Dark Matter Velocity Distribution <i>University of California Irvine</i>	DECEMBER 2017
Empirical Determination of the Dark Matter Velocity Distribution <i>University of Oregon</i>	NOVEMBER 2017
Empirical Determination of the Dark Matter Velocity Distribution <i>Boston University</i>	NOVEMBER 2017
Empirical Determination of the Dark Matter Velocity Distribution <i>University of Illinois Urbana-Champaign</i>	OCTOBER 2017
Empirical Determination of the Dark Matter Velocity Distribution <i>University of California Santa Barbara</i>	OCTOBER 2017
Empirical Determination of the Dark Matter Velocity Distribution <i>California Institute of Technology</i>	OCTOBER 2017
Using Simulations to Improve Dark Matter Searches <i>Harvard University</i>	FEBRUARY 2017
Spherical Cows of Dark Matter Indirect Detection <i>University of California Berkeley</i>	NOVEMBER 2016
Spherical Cows of Dark Matter Indirect Detection <i>Harvard University</i>	OCTOBER 2016
Boosted Dark Matter in Neutrino Experiments <i>Harvard University</i>	OCTOBER 2016
Spherical Cows of Dark Matter Indirect Detection <i>Cornell University</i>	OCTOBER 2016

Spherical Cows of Dark Matter Indirect Detection <i>Princeton University</i>	SEPTEMBER 2016
Boosted Dark Matter in Neutrino Experiments <i>Tufts University</i>	JUNE 2016
(In)Direct Detection of Boosted Dark Matter <i>SLAC</i>	APRIL 2016
INVITED CONFERENCE TALKS	
Shining Light on Dark Matter <i>Pheno 2023, University of Pittsburgh, PA, USA</i>	MAY 9, 2023 <u>PLENARY</u>
Shining Light on Dark Matter <i>LCTP Workshop, University of Michigan Ann Arbor, MI, USA</i>	MAY 1, 2023
George E. Valley Jr. Prize: Shining Light on Dark Matter <i>APS April Meeting 2023, Minneapolis, MN, USA</i>	APRIL 18, 2023
Identifying Kinematic Substructure with Machine Learning <i>Building a Physical Understanding of Galaxy Evolution with Data-driven Astronomy, Santa Barbara, CA, USA</i>	FEBRUARY 21, 2023
<i>Gaia</i> : An Insight into a Billion Stars <i>Workshop on Atomic Dark Matter, Pittsburgh, PA, USA</i>	JANUARY 27, 2023
Shining Light on Dark Matter <i>Kashiwa Dark Matter Symposium 2022, Kashiwa, Japan</i>	NOVEMBER 30, 2022 <u>PLENARY-REMOTE</u>
Robust Clustering of Local Kinematic Stellar Structures with <i>Gaia</i> <i>Towards Real Time Galactic Dynamics, Leiden, Netherlands</i>	JULY 29, 2022
Clustering Stellar Structures and Connections to Dark Matter <i>Summitting the Unknown, Seattle, WA, USA</i>	JULY 14, 2022
Identifying Kinematic Substructure with Machine Learning <i>New Methods and Ideas at the Frontiers of Particle Physics, Aspen, CO, USA</i>	MARCH 24, 2022
Identifying Kinematic Substructure with Machine Learning <i>Nature of Dark Matter on Small Scales, Remote</i>	MARCH 17, 2022
Dark Matter in the Era of Simulations and Data <i>CERN-CKC Theory Workshop, Jeju Island, South Korea</i>	JUNE 2021 <u>PLENARY-REMOTE</u>
Dark Matter in the Era of <i>Gaia</i> <i>Exploring the Dark Side of the Universe, Pointe-A-Pitre, Guadeloupe</i>	MARCH 2020 <u>PLENARY-REMOTE</u>
Dark Matter in the Era of <i>Gaia</i> <i>Theory Meets Experiment, Quy Nhon, Vietnam</i>	JANUARY 2020 <u>PLENARY</u>
Dark Matter in the Era of <i>Gaia</i> <i>Searching for new physics - Leaving no stone unturned!, Salt Lake City, UT, USA</i>	AUGUST 2019

Dark Matter in the Era of <i>Gaia</i> <i>234th AAS Meeting, Saint Louis, MO, USA</i>	JUNE 2019
The Stellar Local Velocity Distribution and its Implications for Dark Matter <i>In the Balance: Stasis and Disequilibrium in the Milky Way, KITP, Santa Barbara, CA, USA</i>	APRIL 2019
Dark Matter in Disequilibrium and its Implications on Direct Detection <i>Interplay between Particle and Astroparticle Physics, Cincinnati, OH, USA</i>	OCTOBER 2018
Reconstructing the Dark Matter Velocity Distribution from the Stars <i>Galaxy Formation and Evolution in Southern California, Pasadena, CA, USA</i>	AUGUST 2018
Dark Matter in Disequilibrium and its Implications on Direct Detection <i>Identification of Dark Matter, Providence, RI, USA</i>	JULY 2018 <u>PLENARY</u>
Dark Matter in Disequilibrium: The Velocity Distribution <i>Near Field Cosmology Workshop, Chicago, IL, USA</i>	JUNE 2018
Light Dark Matter at Neutrino Detectors <i>Light Dark World, Pittsburgh, PA, USA</i>	OCTOBER 2017
CONFERENCE TALKS	
Empirical Determination of the Dark Matter Velocity Distribution <i>UCLA Dark Matter, Los Angeles, CA, USA</i>	FEBRUARY 2018
Empirical Determination of Dark Matter Velocity Distribution <i>Dark Matter of Southern California, Pasadena, CA, USA</i>	SEPTEMBER 2017
Empirical Determination of Dark Matter Velocity Distribution <i>TeVPA, Columbus, Ohio, USA</i>	AUGUST 2017
Constructing Stable Observables with Energy Correlation Functions <i>Jet Substructure "Planning for the Future", Fermilab, USA</i>	NOVEMBER 2016
Spherical Cows of Dark Matter Indirect Detection <i>TeVPA, CERN, Switzerland</i>	SEPTEMBER 2016
Boosted Dark Matter in Neutrino Experiments <i>Dark Side of the Universe, Bergen, Norway</i>	JULY 2016
Dark Matter, Shared Asymmetries, and Galactic Gamma Ray Signals <i>Pheno Symposium, Pittsburgh, USA</i>	MAY 2016
(In)Direct Detection of Boosted Dark Matter <i>TAUP, Torino, Italy</i>	SEPTEMBER 2015
PUBLIC TALKS	
The Genealogy of the Milky Way and the Search for Dark Matter <i>Friends of KITP, Santa Barbara, CA, USA</i>	MARCH 7, 2023
The Genealogy of the Milky Way and the Search for Dark Matter <i>Winter Aspen, Aspen, CO, USA</i>	MARCH 23, 2022
Chasing Dark Matter with the <i>Gaia</i> Enceladus <i>Astronomy on TAP, Santa Barbara, CA, USA</i>	APRIL 2019

TELESCOPE AND COMPUTING ALLOCATIONS

TACC/Frontera: GPUs <i>4,000 Node Hours (PI)</i>	2023
TACC/Frontera <i>194,000 Node Hours (PI)</i>	2023
XSEDE/Bridges-2: GPUs <i>5,000 Node Hours (PI)</i>	2022
XSEDE/Stampede <i>52,000 Node Hours (PI)</i>	2022
Magellan/MIKE <i>High-resolution spectroscopy, 2 nights (PI)</i>	SEMESTER 2021A
Magellan/MIKE <i>High-resolution spectroscopy, 4 nights (PI)</i>	SEMESTER 2020B
Magellan/MIKE <i>High-resolution spectroscopy, 2 nights (co-PI)</i>	SEMESTER 2020A
Keck/HIRES <i>High-resolution spectroscopy, 1 night (PI)</i>	SEMESTER 2020A
XSEDE/Stampede <i>1,600 Node Hours (PI)</i>	2019

TEACHING EXPERIENCE

Physics I, 8.012, Lecturer	FALL 2023
Physics I, 8.012, Lecturer	FALL 2022
Physics I, 8.012, Recitation Instructor	FALL 2021
Supersymmetric Quantum Field Theory, 8.831, Teaching Assistant	SPRING 2017
Quantum Mechanics I, 8.04, Teaching Assistant	FALL 2013, 2016
Graduate Quantum Mechanics, 8.231, Teaching Assistant	FALL 2014
Quantum Mechanics III, 8.06, Teaching Assistant	SPRING 2014, 2015, 2016

PUBLIC ENGAGEMENT

Education

Keynote Speaker at the Future Faculty Fellowship Symposium at Princeton	SPRING 2023
Introducing Galaxy Zoo to K12 and educators	SPRING 2023
Lecturer for Warrior Scholar Project	SUMMER 2022
Luncheon with CCNY Physics Club	SPRING 2022
Skype a Scientist	SPRING 2020

Podcasts

Ga3da Falakia, Tunisian Podcast	SINCE SPRING 2022
Physics in your native language video series	FALL 2021
Interview with The Cosmic Companion	SUMMER 2020
Mindscape Podcast with Sean Carroll	SPRING 2020

Public Events

Organized Exhibit at Cambridge Science Festival	FALL 2022, 2023
Panelist for AstroCareers at the Museum of Science	SUMMER 2022
Astronomy on TAP, Santa Barbara, CA	SPRING 2019
'Science on Saturday', Cambridge, MA	SPRING 2015

SERVICE

Panels

Panelist on University Research Fellowships (URF)	SPRING 2023
Panelist on ERC Grant	SPRING 2022
Panelist on DOE Grant	SPRING 2022
Panelist on NSF CAREER Grant	FALL 2021

Paper Referee

Referee for the Astrophysical Journal Letters (ApJL)	SINCE 2021
Referee for Journal of Cosmology and Astroparticle Physics (JCAP)	SINCE 2021
Referee for Monthly Notices of the Royal Astronomical Society (MNRAS)	SINCE 2018
Referee for Physics Review Letters (PRL)	SINCE 2018
Referee for Journal of High Energy Physics (JHEP)	SINCE 2018
Referee for Physics Review D (PRD)	SINCE 2017

Committees

Chair of Public Engagement Committee at IAIFI	SINCE SUMMER 2022
Barrett Prize committee member	SPRING 2022
Graduate Admissions committee member	WINTER 2023
Written Exam committee member	SUMMER 2023