Siddharth Mishra-Sharma

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Academic Appointments

New York University — **New York, NY, USA**
Center for Cosmology and Particle Physics
Postdoctoral Associate — Sep. 2018 – Present

Education

Princeton University — **Princeton, NJ, USA**
Ph.D. in Physics — Sep. 2013 – Aug. 2018
Advisor: Mariangela Lisanti
Thesis: *Extragalactic Searches for Dark Matter Annihilation*

University of Cambridge — **Cambridge, UK**
Part III of the Mathematical Tripos (M.Math.) — Oct. 2012 – Jun. 2013
B.A. (Hons.) in Natural Sciences (Physical) — Oct. 2009 – Jun. 2012

Publications

*Except where indicated with an astrisk *, authors are listed in alphabetical order as per the standard in particle physics.*

23. A. Caputo, H. Liu, S. Mishra-Sharma, M. Pospelov, J.T. Ruderman, A. Urbano, *Edges and Endpoints in 21-cm Observations from Resonant Photon Production*, [arXiv:2009.03899]
22. *J.J. Somalwar, L.J. Chang, S. Mishra-Sharma, M. Lisanti, *Harnessing the Population Statistics of Subhalos to Search for Annihilating Dark Matter*, under review in Astrophys.J. [arXiv:2009.00021]
21. A. Caputo, H. Liu, S. Mishra-Sharma, J.T. Ruderman, *Modeling Dark Photon Oscillations in Our Inhomogeneous Universe*, under review in Phys.Rev. **D** [arXiv:2004.06733]
20. S. Mishra-Sharma, K. Van Tilburg, N. Weiner, *Power of Halometry*, Phys.Rev. **D102** (2020) 023026 [Editors' Suggestion and Featured in *Physics*; Synopsis] [arXiv:2003.02264]
19. *M. Buschmann, N.L. Rodd, B.R. Safdi, L.J. Chang, S. Mishra-Sharma, M. Lisanti, O. Macias *Foreground Mismodeling and the Point Source Explanation of the Fermi Galactic Center Excess*, Phys.Rev. **D102** (2020) 023023 [arXiv:2002.12373]
18. A. Caputo, H. Liu, S. Mishra-Sharma, J.T. Ruderman, *Dark Photon Oscillations in Our Inhomogeneous Universe*, under review in Phys.Rev.Lett. [arXiv:2002.05165]
17. *J. Brehmer, K. Cranmer, S. Mishra-Sharma, F. Kling, G. Louppe, *Mining gold: Improving simulation-based inference with latent information* [Paper], Machine Learning and the Physical Sciences Workshop at the 33rd Conference on Neural Information Processing Systems (NeurIPS)
16. *J. Brehmer, S. Mishra-Sharma, J. Hermans, G. Louppe, K. Cranmer, *Mining for Dark Matter Substructure: Inferring subhalo population properties from strong lenses with machine learning*, Astrophys.J. **886** (2019) no.1, 49 [arXiv:1909.02005]
15. *L.J. Chang, S. Mishra-Sharma, M. Lisanti, M. Buschmann, N.L. Rodd, B.R. Safdi, *Characterizing the Nature of the Unresolved Point Sources in the Galactic Center: An Assessment of Systematic Uncertainties*, Phys.Rev. **D101** (2020) 023014 [arXiv:1908.10874],
14. J. Alimena *et al.*, *Searching for long-lived particles beyond the Standard Model at the Large Hadron Collider* J.Phys.G 47 (2020) 090501 [arXiv:1903.04497],

13. S. Algeri *et al.*, *Statistical challenges in the search for dark matter* [arXiv:1807.09273]
12. L.J. Chang, M. Lisanti, S. Mishra-Sharma, *Search for Dark Matter Annihilation in the Milky Way Halo*, Phys.Rev. **D98** (2018) 123004 [arXiv:1804.04132]
11. *S. Mishra-Sharma, D. Alonso, J. Dunkley, *Neutrino masses and beyond-ΛCDM cosmology with LSST and future CMB experiments*, Phys.Rev. **D97** (2018) 123544 [arXiv:1803.07561]
10. DarkSide Collaboration, *Constraints on Sub-GeV Dark Matter-Electron Scattering from the DarkSide-50 Experiment*, Phys.Rev.Lett. **121** (2018) 111303 [arXiv:1802.06998]
9. DarkSide Collaboration, *Low-Mass Dark Matter Search with the DarkSide-50 Experiment*, Phys.Rev.Lett. **121** (2018) 081307 [arXiv:1802.06994]
8. R. Bartels, D. Hooper, T. Linden, S. Mishra-Sharma, N.L. Rodd, B.R. Safdi, T.R. Slatyer, *Comment on "Characterizing the population of pulsars in the Galactic bulge with the Fermi Large Area Telescope" [arXiv:1705.00009v1]*, Phys.Dark Univ. **20** (2018) 88-94 [arXiv:1710.10266]
7. M. Lisanti, S. Mishra-Sharma, N.L. Rodd, B.R. Safdi, *Mapping Extragalactic Dark Matter Annihilation with Galaxy Surveys: A Systematic Study of Stacked Group Searches*, Phys.Rev. **D97** (2018) 063005 [arXiv:1709.00416]
6. M. Lisanti, S. Mishra-Sharma, N.L. Rodd, B.R. Safdi, *Search for Dark Matter Annihilation in Galaxy Groups*, Phys.Rev.Lett. **120** (2018) 101101 [arXiv:1708.09385]
5. T. Cohen, M. Lisanti, H. K. Lou, S. Mishra-Sharma, *LHC Searches for Dark Sector Showers*, JHEP **11**, 196 (2017) [arXiv:1707.05326]
4. S. Mishra-Sharma, N.L. Rodd, B.R. Safdi, *NPTFit: A code package for Non-Poissonian Template Fitting*, Astron.J. **153** (2017) no.6, 253 [arXiv:1612.03173]
3. Y. Kahn, G. Krnjaic, S. Mishra-Sharma, T.M.P. Tait, *Light Weakly Coupled Axial Forces: Models, Constraints, and Projections*, JHEP **05**, 002 (2017) [arXiv:1609.09072]
2. M. Lisanti, S. Mishra-Sharma, L. Necib, B.R. Safdi, *Deciphering Contributions to the Extragalactic Gamma-Ray Background from 2 GeV to 2 TeV*, Astrophys.J. **832** (2016) no.2, 117 [arXiv:1606.04101]
1. S.K. Lee, M. Lisanti, S. Mishra-Sharma, B.R. Safdi, *Modulation Effects in Dark Matter-Electron Scattering Experiments*, Phys.Rev. **D92** (2015) 083517 [arXiv:1508.07361]

Selected Seminars and Talks

- BSM PANDEMIC Seminar (Remote talk) — Nov. 2020
- SLAC Elementary Particle Physics Seminar (Remote talk) — Jul. 2020
- University of Amsterdam GRAPPA Colloquium (Remote talk) — May 2020
- Princeton Pheno & Vino Seminar (Remote talk) — Apr. 2020
- CERN-TH BSH Forum (Remote talk) — Apr. 2020
- Machine Learning for Astrophysicists Seminar (Remote talk at mlclub.net) — Mar. 2020
- WFIRST Science Meeting (Flatiron Institute) — New York, NY, Mar. 2020
- Michigan LCTP Brown Bag Seminar — Ann Arbor, MI, Jan. 2020
- Stony Brook University Particle Physics Seminar — Stony Brook, NY, Nov. 2019
- Minnesota High Energy Theory Lunchtime Seminar — Minneapolis, MN, Nov. 2019
- LSST Dark Matter Workshop — Chicago, IL, Aug. 2019
- SUSY 2019 — Corpus Christi, TX, May 2019
- Phenomenology Symposium (Pheno) 2019 — Pittsburgh, PA, May 2019
- Brown Astrophysics Seminar Series — Providence, RI, May 2019
- NYU CCPP Brown Bag Seminar — New York, NY, Apr. 2019
- Particles, Strings and Cosmology (PASCOS) 2018 — Cleveland, OH, Jun. 2018
- Recontres de Blois 2018 — Blois, France, Jun. 2018

- Princeton Astrophysics/IAS Cosmology Lunch Seminar — Princeton, NJ, May 2018
- Fermilab Particle Astrophysics Seminar — Batavia, IL, Mar. 2018
- Workshop on Statistical Challenges in the Search for Dark Matter — Banff, Canada, Feb. 2018
- Maryland Elementary Particle Theory Seminar — College Park, MD, Nov. 2017
- Rutgers High Energy Theory Seminar — New Brunswick, NJ, Nov. 2017
- Cornell Particle Theory Seminar — Ithaca, NY, Nov. 2017
- Caltech Particle Theory Seminar — Pasadena, CA, Oct. 2017
- UC Irvine Joint Particle Seminar — Irvine, CA, Oct. 2017
- ICTP LHC Long-Lived Particles Community Workshop (Remote talk) — Oct. 2017
- Oxford Dalitz Seminar in Fundamental Physics — Oxford, UK, Oct. 2017
- KIPAC Tea Talk — Stanford, CA, Sep. 2017
- UC Santa Cruz Institute for Particle Physics Seminar — Santa Cruz, CA, Sep. 2017
- Berkeley 4D Seminar — Berkeley, CA, Sep. 2017
- Dark Matter, Neutrinos and their Connection (DAνCO) — Odense, Denmark, Aug. 2017
- TeV Particle Astrophysics (TeVPA) 2017 — Columbus, OH, Aug. 2017
- Phenomenology Symposium (Pheno) 2017 — Pittsburgh, PA, May 2017
- Princeton Pheno & Vino Seminar — Princeton, NJ, Apr. 2017
- APS April Meeting 2017 — Washington, DC, Jan. 2017
- MIT BSM Journal Club — Boston, MA, Nov. 2016
- TeV Particle Astrophysics (TeVPA) 2016 — Geneva, Switzerland, Sep. 2016
- Gamma Rays and Dark Matter Workshop — Obergurgl, Austria, Dec. 2015
- Phenomenology Symposium (Pheno) 2015 — Pittsburgh, PA, May 2015

Workshops and Schools

- *Gaia* Sprint 2019 — Santa Barbara, CA, Mar. 2019
- Accelerating the Search for Dark Matter with Machine Learning — Leiden, Netherlands, Jan. 2018
- Prospects in Theoretical Physics (PiTP) — Princeton, NJ, Jul. 2017
- Theoretical Advanced Study Institute (TASI) — Boulder, CO, Jun. 2016
- Tri-Institute Summer School on Elementary Particles (TRISEP) — Waterloo, Canada, Jul. 2015

Teaching Experience

Course numbers refer to courses taught at Princeton.

- PHY235 Introduction to Research in Physics — Spring 2018
- PHY312 Experimental Physics — Spring 2018
- PHY115 Physics for Future Leaders — Fall 2017
- PHY104 General Physics II — Spring 2016
- PHY406 Nuclear and Elementary Particle Physics — Fall 2015
- PHY106 Advanced Physics (Electromagnetism) — Spring 2015
- MAT201 Calculus III (Multivariable Calculus) — Fall 2014, 2015
- PHY105 Advanced Physics (Mechanics) — Fall 2014

Prizes and Honours

- Department Teaching Award, Princeton Department of Physics — 2018
  Awarded for excellence in the role of Assistant in Introduction for courses taught at Princeton.

- Kusaka Memorial Prize in Physics, Princeton Department of Physics 2017
  Awarded to physics graduate students who have shown outstanding performance in research and professional promise.
- Princeton Graduate School Impact Award 2016
  Awarded to an individual in the community that has made a difference during their time at Princeton.
- Princeton First-Year Graduate Fellowship 2013
  Awarded for the first year of graduate study at Princeton.
- Hugo de Balsham Prize 2012
  Awarded for exceptional academic distinction at Peterhouse, Cambridge.
- Peter Scheuer Scholarship in Natural Sciences 2011, 2012
  Awarded for exceptional academic performance in Cambridge second/third year Tripos examinations.
- Senior Academic Scholarship of Peterhouse, Cambridge 2010
  Awarded for exceptional academic performance in Cambridge first year Tripos examinations.

Broader Impact and Community

- *Referee*, Phys. Rev. D, Phys. Rev. Lett, Comput. Phys. Commun., JHEP 2017 – Present
- *Organizer*, NYU CCPP Particle Physics Seminar 2019 – 2020
- *Member*, Princeton University Student Life Committee 2016 – 2018
- *Vice Chair*, Princeton Graduate College House Committee 2016 – 2018
- *Subject Representative*, Princeton Graduate Student Government Assembly 2013 – 2017
- *Organizer*, Princeton Physics Department Open House Committee 2015 – 2016
- *Chair*, Princeton Physics Graduate Student Council 2015 – 2018

Research Training

- CERN Geneva, Switzerland
  Visiting Student, CMS Experiment Aug. – Sep. 2012
- DAMTP, University of Cambridge Cambridge, UK
  Summer Student Jun. – Jul. 2012
- Institute of Astronomy, University of Cambridge Cambridge, UK
  Summer Student Aug. – Sep. 2011
- CERN Geneva, Switzerland
  Summer Student, CMS Experiment Jun. – Jul. 2011