

SHIRLEY WEISHI LI

SLAC National Accelerator Laboratory
2575 Sand Hill Rd, Menlo Park, CA 94025

E-mail: shirleyl@slac.stanford.edu
<http://www.slac.stanford.edu/~shirleyl/>

Research Interests

Neutrino physics, QCD, physics beyond the Standard Model, nuclear astrophysics

Employment

| | |
|---|--------|
| SLAC National Accelerator Laboratory Postdoctoral Research Associate, Theoretical Particle Physics Group | 2017 – |
|---|--------|

Education

| | |
|--|------|
| The Ohio State University Ph.D. in Physics Advisor: Prof. John F. Beacom | 2017 |
| The Ohio State University B.S. with Summa Cum Laude in Physics Advisor: Prof. Richard J. Furnstahl | 2011 |

Awards

| | |
|--|-------------|
| APS Dissertation Award in Nuclear Physics | 2019 |
| APS Finalist in 2018 Outstanding Doctoral Thesis Award in Astrophysics competition | 2018 |
| OSU Bunny and Thomas Clark Graduate Student Scholarship | 2017 |
| Louise B. Vetter Research Award (sponsored by Phi Kappa Phi) | 2016 |
| OSU Presidential Fellowship | 2016 – 2017 |
| OSU Hayes Graduate Research Forum Talk Award | 2016 – 2017 |
| OSU Department of Physics graduate student poster competition | 2014 – 2015 |
| OSU Department of Physics Smith Senior Awards | 2011 |
| APS Conference Experience for Undergraduates at DNP Meeting | 2010 |
| OSU Department of Physics Smith Junior Awards | 2010 |
| OSU Undergraduate Research Office Summer Research Fellowship | 2010 |

Refereed Journal Publications

12. “The generalized infrared structure of the gluon propagator”
Shirley W. Li, Peter Lowdon, Orlando Oliveira, Paulo J. Silva
arXiv:1907.10073
11. “Dark Sector Equilibration During Nucleosynthesis”
Asher Berlin, Nikita Blinov, **Shirley W. Li**
Phys. Rev. D 100, 015038 (2019) [arXiv:1904.04256]
10. “Developing the MeV Potential of DUNE:
Detailed Considerations of Muon-Induced Spallation and Other Backgrounds”
Guanying Zhu, **Shirley W. Li**, John F. Beacom
Phys. Rev. C 99, 055810 (2019) [arXiv:1811.07912]

9. “Understanding the Energy Resolution of Liquid Argon Neutrino Detectors”
Alexander Friedland, **Shirley W. Li**
Phys. Rev. D 99, 036009 (2019) [arXiv:1811.06159]
8. “DUNE as the Next-Generation Solar Neutrino Experiment”
Francesco Capozzi, **Shirley W. Li**, Guanying Zhu, John F. Beacom
Phys. Rev. Lett. 123, 131803 (2019) [arXiv:1808.08232]
7. “Dark Kinetic Heating of Neutron Stars and An Infrared Window On WIMPs, SIMPs, and Pure Higgsinos”
Masha Baryakhtar, Joseph Bramante, **Shirley W. Li**, Tim Linden, Nirmal Raj
Phys. Rev. Lett. 119, 131801 (2017) [arXiv:1704.01577]
6. “Using HAWC to Discover Invisible Pulsars”
Tim Linden et al. (*incl.* **Shirley W. Li**)
Phys. Rev. D 96, 103016 (2017) [arXiv:1703.09704]
5. “Echo Technique to Distinguish Flavors of Astrophysical Neutrinos”
Shirley W. Li, Mauricio Bustamante, John F. Beacom
Phys. Rev. Lett. 122, 151101 (2019) [arXiv:1606.06290]
4. “Tagging Spallation Backgrounds with Showers in Water-Cherenkov Detectors”
Shirley W. Li, John F. Beacom
Phys. Rev. D 92, 105033 (2015) [arXiv:1508.05389]
3. “Spallation Backgrounds in Super-Kamiokande Are Made in Muon-Induced Showers”
Shirley W. Li, John F. Beacom
Phys. Rev. D 91, 105005 (2015) [arXiv:1503.04823]
2. “First calculation of cosmic-ray muon spallation backgrounds for MeV astrophysical neutrino signals in Super-Kamiokande”
Shirley W. Li, John F. Beacom
Phys. Rev. C 89, 045801 (2014) [arXiv:1402.4687]
1. “The Similarity Renormalization Group with Novel Generators”
Shirley W. Li, E. R. Anderson, R. J. Furnstahl
Phys. Rev. C 84, 054002 (2011) [arXiv:1106.2835]

White Papers

2. “Neutrino Non-Standard Interactions: A Status Report”
arXiv:1907.00991
1. “Supernova Physics at DUNE”
arXiv:1608.07853

Scientific Presentations (36 invited talks)

- | | |
|--|---------|
| 57. Invited Talk, Texas A&M Mitchell Institute Seminar, College Station, TX | 11/2019 |
| 56. Invited Talk, APS DNP Meeting, Arlington, VA | 10/2019 |
| 55. Invited Talk, Topics in Cosmic Neutrino Physics, Batavia, IL | 10/2019 |
| 54. Talk, International Cosmic Ray Conference, Madison, WI | 07/2019 |
| 53. Talk, Precision Investigations of the Neutrino Sector, Menlo Park, CA | 07/2019 |
| 52. Invited Talk, University of Oregon Institute for Theoretical Science Seminar, Eugene, OR | 06/2019 |
| 51. Invited Talk, NTN Workshop on Neutrino Non-Standard Interactions, St. Louis, MO | 05/2019 |
| 50. Invited Talk, SUSY 2019, Corpus Christi, TX | 05/2019 |

49. Plenary Talk, Conference on Science at the SURF, Rapid City, SD 05/2019
48. Invited Talk, LCTP Spring Symposium, Ann Arbor, MI 04/2019
47. Invited Talk, Bay Area Particle Theory Seminar, San Francisco, CA 03/2019
46. Invited Talk, Electron-Nuclear Scattering Prospects at S30XL, Menlo Park, CA 03/2019
45. Invited Talk, Physics Opportunities in the near DUNE Detector hall, Batavia, IL 12/2018
44. Invited Talk, UPenn Experimental Particle Physics Seminar, Philadelphia, PA 10/2018
43. Invited Talk, NUFACT 2018, Blacksburg, VA 08/2018
42. Invited Talk, Fermilab Theory Seminar, Batavia, IL 06/2018
41. Invited Talk, UC Davis Joint Theory Seminar, Davis, CA 06/2018
40. Invited Talk, Caltech High Energy Physics Seminar, Pasadena, CA 05/2018
39. Invited Talk, LBNL Institute for Nuclear and Particle Astrophysics Seminar, Berkeley, CA 05/2018
38. Invited Talk, Rising Stars in Physics Workshop, Boston, MA 04/2018
37. Invited Talk, APS April Meeting, Columbus, OH 04/2018
36. Invited Talk, ASU Cosmology Seminar, Tempe, AZ 04/2018
35. Invited Talk, SLAC Elementary Particle Physics Seminar, Menlo Par, CA 01/2018
34. Invited Talk, Livermore Nuclear and Chemical Sciences Colloquium, Livermore, CA 11/2017
33. Invited Talk, LBNL Particle Theory Seminar, Berkeley, CA 11/2017
32. Plenary Talk, NNN17, Coventry, UK 10/2017
31. Invited Talk, TeVPA 2017, Columbus, OH 08/2017
30. Invited Talk, New Directions in Dark Matter and Neutrino Physics, Waterloo, Canada 07/2017
29. Talk, OSU CCAPP Summer Seminar, Columbus, OH 06/2017
28. Talk, Baryon and Lepton Number Violation Workshop, Cleveland, OH 05/2017
27. Invited Talk, IceCube Particle Astrophysics Symposium, Madison, WI 05/2017
26. Invited Talk, SLAC Neutrino Workshop, Menlo Park, CA 03/2017
25. Invited Talk, Supernova at Hyper-Kamiokande, Tokyo, Japan 02/2017
24. Talk, Frontiers in Nuclear Astrophysics meeting, East Lansing, MI 02/2017
23. Invited Talk, WIPAC seminar, Madison, WI 12/2016
22. Plenary talk, NNN16, Beijing, China 11/2016
21. Invited Talk, OSU Nuclear Theory Seminar, Columbus, OH 10/2016
20. Invited Talk, PSU High-Energy Physics Seminar, State College, PA 10/2016
19. Invited Talk, MSU NSCL Theory Seminar, East Lansing, MI 09/2016
18. Talk, Flavor Observations with Supernova Neutrinos, Seattle, WA 08/2016
17. Talk, OSU CCAPP Summer Seminar, Columbus, OH 07/2016
16. Talk, Phenomenology 2016, Pittsburgh, PA 05/2016
15. Talk, APS April Meeting, Salt Lake City, UT 04/2016
14. Invited Talk, FroST 2016, Batavia, IL 03/2016
13. Invited Talk, SN@DUNE, Blacksburg, VA 03/2016
12. Talk, PIKIO, Cincinnati, OH 02/2016
11. Poster, NNN15, Stony Brook, NY 10/2015
10. Talk, Nu@Fermilab, Batavia, IL 07/2015
9. Talk, CIPANP 2015, Vail, CO 05/2015
8. Talk, IceCube Particle Astrophysics Symposium, Madison, WI 05/2015
7. Talk, OSU CCAPP summer seminar, Columbus, OH 06/2014
6. Poster, Neutrino 2014, Boston, MA 06/2014
5. Talk, APS April Meeting, Savannah, GA 04/2014
4. Talk, APS DNP Meeting, Newport Beach, CA 10/2012
3. Talk, OSU Physics Summer Talk Series, Columbus, OH 08/2012
2. Poster, APS DNP Meeting, Santa Fe, NM 11/2010
1. Poster, OSU Fall Undergraduate Research Day Student Poster Forum, Columbus, OH 10/2010

Summer Schools

| | |
|--|------|
| SLAC Summer Institute: Shining Light on Dark Matter member of group selected for best student project | 2014 |
| Tri-Institute Summer School on Elementary Particles | 2013 |

Teaching Experience

| | |
|--|-------------|
| Teaching Assistant, Physics 1250, Mech, Thermo, Waves, OSU | 2012 – 2013 |
| Grader, Physics 834, Mathematical Methods, OSU | 2011 |

Research Advising Experience

Guanying Zhu (graduate student at OSU)

Service

Referee for Astroparticle Physics, Journal of High Energy Physics, Journal of Physics G: Nuclear and Particle Physics, The Astronomical Journal

Outreach

| | |
|---|-------------|
| Volunteer, SAGE-S Summer Camp, Menlo Park, CA | 2018 |
| Lecturer, Young Scholars Program, Columbus, OH | 2016 |
| Volunteer, “Astro Camp”, Columbus, OH | 2016 |
| Volunteer Judge, State Science Day, Columbus, OH | 2014 – 2017 |
| Volunteer Judge, OSU Denman Undergraduate Research Forum | 2016 – 2017 |
| Talk, “How to Give a Scientific Talk”, ASPIRE CAMP, OSU | 2015, 2017 |
| Volunteer Judge, OSU Natural and Mathematical Sciences Undergrad Research Forum | 2015 |
| Blog article, “My first conference talk experience”, Blog “A day in the life...”, OSU | 2012 |
| Demonstrator, “My Quantum Mom” at COSI, Columbus, OH | 2011 |

Collaborations

DUNE

References

Prof. John Beacom
Department of Physics and Astronomy
The Ohio State University
beacom.7@osu.edu

Prof. Natalia Toro
Theory Group
SLAC National Accelerator Laboratory
ntoro@slac.stanford.edu

Dr. Alexander Friedland
Theory Group
SLAC National Accelerator Laboratory
alexfr@slac.stanford.edu

Prof. Kendall Mahn
Department of Physics and Astronomy
Michigan State University
mahn@pa.msu.edu

Prof. Luke Roberts
National Superconducting Cyclotron Laboratory
Michigan State University
robertsl@nscl.msu.edu

Prof. Lindley Winslow
Department of Physics
Massachusetts Institute of Technology
lwinslow@mit.edu