

# XIN QIAN

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## EDUCATION AND TRAINING

California Institute of Technology, Pasadena, CA 2010-2013  
*Robert A. Millikan Postdoctoral Scholar in Experimental Physics*

Duke University, Durham, NC May 2010  
**Ph.D. Experimental Nuclear Physics**

Peking University, Beijing, China July 2003  
**B.S. Physics**

## RESEARCH EXPERIENCE

**Brookhaven National Laboratory, Deputy Group Leader of the EDG** Oct. 2023 -  
**Brookhaven National Laboratory, Physicist with the Distinction of Tenure** Apr. 2020 -

**Stony Brook University, Adjunct Associate Professor** Sep. 2020 -

**Brookhaven National Laboratory, Physicist** Oct. 2017 -Apr. 2020

**Brookhaven National Laboratory, Associate Physicist** Oct. 2015-Oct.2017

**Brookhaven National Laboratory, Assistant Physicist** Oct. 2013-Oct. 2015

**Brookhaven National Laboratory, Research Associate** May 2013-Oct. 2013

**California Institute of Technology**, Pasadena, CA June 2010—May 2013  
Kellogg Radiation Laboratory  
*Robert A. Millikan Postdoctoral Scholar in Experimental Physics*  
Advisor: Prof. Robert D. McKeown

**Jefferson Laboratory**, Newport News, VA August 2005—May 2009  
*Graduate Research Assistant*  
Supervisor: Dr. Jian-Ping Chen

**Duke University**, Department of Physics, Durham, NC August 2003—May 2010  
*Graduate Research Assistant*  
Advisor: Prof. Haiyan Gao

**Peking University**, Department of Physics, Beijing, China May 2001 —May 2003  
*Undergraduate Research Assistant*  
Advisor: Prof. Bo-Qiang Ma

## **AWARDS & HONORS**

- 2023 the [High Energy and Particle Physics Prize](#), EPS-HEPP as a collaborator from the Daya Bay collaboration
- 2022 BNL Science and Technology Award (The highest honor at BNL)
- 2023-2024 BNL LDRD “Dual Calorimetry and 6-D Tracking with LAr TPC for Physics Discovery”, co-PI (\$500k per year for 2.5 years)
- 2023-2024 BNL LDRD “R&D for PIONEER: a Next-generation Rare Pion Decay Experiment” co-PI (\$200k per year)
- 2020 Granted Distinction of Tenure (DT) by BNL
- 2019 LLNL Director’s Science and Technology award as a member of the PROSPECT collaboration
- 2018 Future Leaders’ Program, Science and Technology in Society (STS) Forum @ Japan
- 2017 EPS Young Experimental Scientist Prize
- 2016 Breakthrough Prize as a member of the Daya Bay Collaboration
- 2015 BNL Sambamurti Lecturer
- 2014 DOE Early Career Award (\$500k per year for 5 years)
- 2011 Jefferson Laboratory Thesis Prize
- 2010 Caltech Postdoctoral Prize Fellowship in Experimental Physics or Astrophysics
- 2005 and 2006 Southern Universities Research Association/Jefferson Lab Graduate Fellowship
- 2002 T. D. Lee scholar (Chinese national undergraduate research award)

## **PROFESSIONAL SERVICE/SOCIETIES**

- Lead organizer of “The Second Wire-Cell Event Reconstruction Summit” (2024/4)
- J-PARC Program Advisory Committee (2024-2028)
- DUNE Authorship and Publications Board Deputy chair (2024-Now)
- BNL DUNE Institutional Board Representative (2023-Now)
- BNL MicroBooNE Institutional Board Representative (2015-2023)
- Co-convenor, TDAQ and AI/ML session, CPAD 2022 at SBU (<https://www.stonybrook.edu/cfns/cpad2022/index.html>)
- Senior Advisory Board, MicroBooNE collaboration (2022-)
- Teaching of PHY 599 (Graduate Student Seminar HEP/NP/Astro) at SBU for fall 2022-2023 semester.
- 2023/2024 Swiss NSF Reviewer
- 2022/2023 NSF Reviewer
- DUNE Vertical Drift Task Force Member (2021-)
- Organizing committee of “Brookhaven Forum 2021: Opening New Windows to the Universe.” (BF2021) Sep or Nov, 2021
- Co-organizer of the particle physics seminar of Stony Brook University (2021 Spring)
- Organizer of the “MicroBooNE annual analysis retreat” at BNL, Dec 9-13<sup>th</sup>, 2019
- Local and international organizing committee member of “Module of Opportunity for DUNE”, Nov 12-13, 2019
- DOE Proposal Reviewer
- Scientific Program Committee of the PHYSTAT-nu 2019 workshop @ CERN.
- Speaker’s committee member of Daya Bay (2015-)
- Particle physics seminar committee member of BNL physics department (2015-2017, Chair in 2016-2017)

- Convener of “X-sec/ND Limitations” working group of Viet Nus 2017  
<https://sites.cns.utexas.edu/vietnus/>
- Co-chair of “Parallel session of detector and calibration” in NNN 2016
- Co-convener of DUNE Far Detector Simulation/Reconstruction Working Group (2015-2017)
- Local organizer committee, workshop on the Intermediate Neutrino Program (2015)
- Speaker’s committee member of JUNO (2014-2015)
- Referee of “Journal of Physics G: Nuclear and Particle Physics”, “Journal of High Energy Physics” (JHEP), “International Journal of Modern Physics E” (IJMPE), “Modern Physics Letter A” (MPLA), “Chinese Physics C” (CPC), “Journal of Instrumentation” (JINST), “Physical Review D” (PRD), “Physical Review Letter” (PRL), “European Physics Journal C” (EPJC).
- 2013 DNP: Chair of the Mini-symposium on reactor anti-neutrinos
- 2012-2013: Daya Bay experiment Institution Board member (representing Caltech)
- 2010-Present: International Organization of Chinese Physicists and Astronomers (OCPA life member)
- 2005-Present: American Physics Society (APS life member)

## **EXPERIMENTAL PROPOSALS @ JLab**

1. “Near-threshold Electroproduction of  $J/\psi$  with 11 GeV Beam” (E12-12-006)  
*Was Co-spokesperson*
  - This proposal was approved with full beam time and A- rating in PAC39
  - Spokespersons: K. Hafidi, Z. E. Meziani, **X. Qian**, N. Sparveris, and Z. W. Zhao
2. 12 GeV transversity proposal using a Large Acceptance Solenoid Detector (E12-10-006)  
*Was Co-spokesperson*
  - This proposal was fully approved in PAC35 and rated A with 90 days of beam time in PAC38
  - Spokespersons: J.-P. Chen, H. Gao (contact), X. Jiang, J.-C. Peng and **X. Qian**
3. 12 GeV proposal on measurement of Single Spin Asymmetries using SoLID and a transversely polarized  $\text{NH}_3$  target  
*Major contributor: experimental design & detector simulation*
  - This proposal was fully approved with A rating in PAC39
  - Spokespersons: K. Allada, J.-P. Chen, H. Gao (contact), Z.-E. Meziani, and X.-M. Li
4. “Searching Color Transparency using photo-pion production on  $^4\text{He}$ ” (PR-12-07-103) (PAC32)  
*Major Contributor: experimental design & detector simulation*
  - Presented the proposal on behalf of the collaboration in PAC32
  - Spokespersons: D. Dutta and H. Gao
5. “Probing the Light Quark Sea Flavor Asymmetry with Semi-inclusive Charged Pion Production in Hall C” (PR-06-111) (PAC30)  
*Major Contributor: experimental design & detector simulation*
  - Spokespersons: A. Bruell, J.-P. Chen, H. Mkrtchyan, H. Gao (contact) and L.-Y. Zhu
6. 12 GeV proposal on measurement of Single/Double Spin Asymmetries using SoLID and a longitudinal polarized  $^3\text{He}$  target (E12-11-007)  
*Contributor: detector simulation*
  - This proposal was fully approved in PAC36 and rated A with 35 days of beam time in PAC38
  - Spokespersons: J.-P. Chen, J. Huang (contact), Y. Qiang, and W.-B. Yan
7. 6 GeV proposal on measurement of Single Spin Asymmetries with a transversely polarized  $^3\text{He}$  target through Semi-inclusive Deep inelastic electro-pion production (E06-010/E06-011)  
*Contributor: background simulation of BigBite spectrometer*
  - This proposal was approved with physics A rating in PAC 29

- Spokespersons: J.-P. Chen, E. Cisbani, H. Gao, X. Jiang (contact), J.-C. Peng
8. Letter of Intent, “Searching for  $\varphi - N$  bound state from photo production from nuclear targets” (PAC33)  
*Contributor*
- Spokespersons: Y. Qiang and H. Gao

### **REFEREED JOURNAL PUBLICATION (Major Contribution)**

1. “A Hybrid 3D/2D Field Response Calculation for Liquid Argon Detectors with PCB Based Anode Plane”, S. Martynenko et al. [arXiv:2303.10224](#), [JINST 18, P04033](#) (2023).
2. “First constraints on light sterile neutrino oscillations from combined appearance and disappearance searches with the MicroBooNE detectors”, MicroBooNE collaboration, [arXiv:2210.10216](#), [Phys. Rev. Lett. 130, 011801](#) (2023).
3. “Parameterization of Electron Attachment Rate Constants for Common Impurities in LArTPC Detectors”, Y. Li et al. [arXiv:2205.06888](#), [JINST 17, T11007](#) (2022).
4. “First measurement of high-energy reactor antineutrinos at Daya Bay”, Daya Bay collaboration, [arXiv:2203.06686](#), [Phys. Rev. Lett. 129, 041801](#) (2022).
5. “Search for an Excess of Electron Neutrino Interactions in MicroBooNE using Multiple Final State Topologies”, MicroBooNE collaboration, [arXiv:2110.14054](#), [Phys. Rev. Lett. 128, 241801](#) (2022).
6. “Search for an Anomalous Excess of Inclusive Charged-Current  $\nu_e$  Interactions in the MicroBooNE Experiment using Wire-Cell reconstruction”, MicroBooNE collaboration, [arXiv:2110.13978](#), [Phys. Rev. D105, 112005](#) (2022).
7. “First Measurement of Energy-dependent Inclusive Muon Neutrino Charged-Current Cross Sections on Argon with the MicroBooNE Detector”, MicroBooNE collaboration, [arXiv:2110.14023](#), [Phys. Rev. Lett. 128, 151801](#) (2022).
8. “Joint Determination of Reactor Antineutrino Spectra from  $^{235}\text{U}$  and  $^{239}\text{Pu}$  Fission by Daya Bay and PROSPECT”, Daya Bay and PROSPECT collaborations, [arXiv:2106.12251](#), [Phys. Rev. Lett. 128, 081801](#) (2022).
9. “Wire-Cell 3D Pattern Recognition Techniques for Neutrino Event Reconstruction in Large LArTPCs: Algorithm Description and Quantitative Evaluation with MicroBooNE simulation”, MicroBooNE collaboration, [arXiv:2110.13961](#), [JINST 17, P01037](#) (2022).
10. “Antineutrino Energy Spectrum Unfolding Based on the Daya Bay Measurement and Its Applications”, Daya Bay collaboration, [arXiv:2102.04614](#), [Chinese Phys. C45, 073001](#) (2021).
11. “Neutrino Event Selection in the MicroBooNE Liquid Argon Time Projection Chamber using Wire-Cell 3D Imaging, Clustering, and Charge-Light Matching”, MicroBooNE collaboration, [arXiv:2011.01375](#), [JINST 16, P06043](#) (2021).
12. “Cosmic Ray Background Rejection with Wire-Cell LArTPC Event Reconstruction in the MicroBooNE Detector”, MicroBooNE collaboration, [arXiv:2101.05078](#), [Phys. Rev. Applied 15, 064071](#) (2021).
13. “Modeling Impurity Concentrations in Liquid Argon Detectors”, A. Zhang et al., [arXiv:2009.10906](#), [NIMA 1010, 165491](#) (2021).
14. “Augmented Signal Processing in Liquid Argon Time Projection Chamber”, [arXiv:2007.12743](#), [JINST 16 P01036](#) (2020).
15. “Measurement of Space Charge Effects in the MicroBooNE LArTPC Using Cosmic Muons”, [arXiv:2008.09765](#), [JINST 15, P12037](#) (2021).
16. “First results on ProtoDUNE-SP liquid argon time projection chamber performance from a beam test at the CERN Neutrino Platform”, DUNE collaboration, [arXiv:2007.06722](#), [JINST 15, P12004](#) (2020).
17. “Combined Neyman-Pearson Chi-square: An Improved Approximation of Poisson-likelihood Chi-square:”, X. Ji W. Q. Gu, X. Qian, H. Wei, C. Zhang, [arXiv:1903.07185](#), [NIMA 961, P163677](#) (2020).

18. "A high precision calibration of the nonlinear energy response at Daya Bay", Daya Bay Collaboration, [arXiv:1902.08241](#), [NIMA 940, 230 \(2019\)](#).
19. "First Measurement of Inclusive Muon Neutrino Charged Current Differential Cross Sections on Argon at  $E_{\nu} \sim 0.8$  GeV with the MicroBooNE Detector", MicroBooNE collaboration, [arXiv:1905.09694](#), [Phys. Rev. Lett. 123, 131801 \(2019\)](#).
20. "Measurement of Individual Antineutrino Spectra from  $^{235}\text{U}$  and  $^{239}\text{Pu}$  at Daya Bay", Daya Bay Collaboration, [arXiv:1904.07812](#), [Phys. Rev. Lett. 123, 801 \(2019\)](#).
21. "Measurement of the Antineutrino Spectrum from  $^{235}\text{U}$  Fission at HFIR with PROSPECT", PROSPECT Collaboration, [arXiv:1812.10877](#), [PRL 122, 251801 \(2019\)](#).
22. "Ionization Electron Signal Analysis and Processing in Single Phase LArTPCs. I. Algorithm Description and Quantitative Evaluation with MicroBooNE Simulation", MicroBooNE Collaboration, [arXiv:1802.08709](#), [JINST, 13, P07006 \(2018\)](#).
23. "Ionization Electron Signal Analysis and Processing in Single Phase LArTPCs. II. Data/Simulation Comparison and Performance in MicroBooNE", MicroBooNE Collaboration, [arXiv:1804.02583](#), [JINST, 13, P07007 \(2018\)](#).
24. "Three-dimensional Imaging for Large LArTPCs", **X. Qian**, Chao Zhang, Brett Viren, and Milind Diwan, [arXiv:1803.04850](#), [JINST, 13, P05032 \(2018\)](#).
25. "The Flash ADC system and PMT waveform reconstruction for the Daya Bay Experiment", Y. Huang et al., [arXiv:1707.03699](#), [NIMA, 895, 48 \(2018\)](#).
26. "Data Unfolding with Wiener-SVD Method", W. Tang, X. Li, **X. Qian**, H. Wei, C. Zhang, [arXiv:1705.03568](#), [JINST, 12, P10002 \(2017\)](#).
27. "Noise Characterization and Filtering in the MicroBooNE Liquid Argon TPC", MicroBooNE Collaboration, [arXiv:1705.07341](#), [JINST, 12, P08003 \(2017\)](#).
28. "Measurement of electron antineutrino oscillation based on 1230 days of operation of the Daya Bay experiment", Daya Bay Collaboration, [arXiv:1610.04802](#), [Phy. Rev. D95, 072006 \(2017\)](#). (100+ citations)
29. "Limits on Active to Sterile Neutrino Oscillations from disappearance Searches in MINOS, Daya Bay and Bugey-3 Experiment", Daya Bay + MINOS Collaborations, [arXiv:1607.01177](#), [Phy. Rev. Lett. 117, 151801 \(2016\)](#), BNL-113263-2016-JA. (90+ citations)
30. "Improved Search for a Light Sterile Neutrino with the Full Configuration of the Daya Bay Experiment", Daya Bay Collaboration, [arXiv:1607.01174](#), [Phys. Rev. Lett. 117, 151802 \(2016\)](#), BNL-113238-2016-JA. (50+ citations)
31. "A 20-Liter Test Stand with Gas Purification for Liquid Argon Research", Y. Li et al., [arXiv:1602.01884](#), [JINST 11, T06001 \(2016\)](#).
32. "CLs Method at Gaussian Limit to Present Searches in Continuous Parameter Space", **X. Qian** et al., [arXiv:1407.5052](#), [NIMA 827, 63 \(2016\)](#).
33. "New Measurement of  $\theta_{13}$  via neutron capture on hydrogen at Daya Bay", Daya Bay Collaboration, [arXiv:1603.03549](#), [Phys. Rev. D93, 072011 \(2016\)](#).
34. "Measurement of Longitudinal Electron Diffusion in Liquid Argon", Y. Li, et al., [arXiv:1508.07059](#), [NIMA, 816, 160 \(2016\)](#).
35. "Measurement of the Reactor Antineutrino Flux and Spectrum at Daya Bay", Daya Bay Collaboration, [arXiv:1508.04233](#), [Phys. Rev. Lett. 116, 061801 \(2016\)](#). (150+ citations)
36. "The Detector System of The Daya Bay Reactor Antineutrino Experiment", Daya Bay Collaboration, [arXiv:1508.03943](#), [NIMA, 811, 133-161 \(2016\)](#).
37. "A new measurement of antineutrino oscillation with full detector configuration at Daya Bay", Daya Bay Collaboration, [arXiv:1505.03456](#), [Phys. Rev. Lett. 115, 111802 \(2015\)](#). (150+ citations)
38. "Measurement of Pretzlosity Asymmetry of Charged Pion Production in Semi-Inclusive Deep-Inelastic Scattering on a polarized  $^3\text{He}$  Target" Y. Zhang, **X. Qian** et al. [arXiv:1312.3047](#), [Phys. Rev. C90, 055209 \(2014\)](#).
39. "Measurements of azimuthal asymmetries of charged kaons produced in electrons scattering off transversely polarized  $^3\text{He}$ ", Y. X. Zhao *et al.* [arXiv:1404.7204](#), [Phys. Rev. C90, 055201 \(2014\)](#).



40. "Independent Measurement of Theta13 via Neutron Capture on Hydrogen at Daya Bay", Daya Bay Collaboration, [arXiv:1406.6468](#), [Phys. Rev. D90, 071101R \(2014\)](#). (50+ citations)
41. "Search for a Light Sterile Neutrino at Daya Bay", Daya Bay collaboration, [arXiv:1407.7259](#), [Phys. Rev. Lett. 113, 141802 \(2014\)](#). (100+ citations)
42. "Measurement of the Target-Normal Single Spin Asymmetry in the Inclusive Deep-Inelastic Scattering Region from the reactor  ${}^3\text{He}(e,e')$ " J. Katich, **X. Qian** et al. [arXiv:1311.0197](#), [Phys. Rev. Lett. 113, 022502 \(2014\)](#).
43. "Automated Calibration System for a High-Precision Measurement of Neutrino Mixing Angle  $\theta_{13}$  with the Daya Bay Antineutrino Detectors", J. Liu et al. [arXiv:1305.2248](#), [Nucl. Instrum. Meth. A750, 19 \(2014\)](#).
44. "Single Target-Spin Asymmetries in Inclusive Hadron Electroproduction on a Transversely Polarized  ${}^3\text{He}$  Target at  $\langle p_T \rangle = 0.64$  GeV/c", K. Allada et al. [arXiv:1311.1866](#), [Phys. Rev. C89, 042201R \(2014\)](#).
45. "Spectral measurement of electron antineutrino oscillation amplitude and frequency at Daya Bay", Daya Bay Collaboration, [arXiv:1310.6732](#), [Phys. Rev. Lett. 112, 061801 \(2014\)](#). (300+ citations)
46. "Reactor Antineutrino Anomaly with known  $\theta_{13}$ " C. Zhang, **X. Qian**, and P. Vogel, [arXiv:1303.0900](#), [Phys. Rev. D87, 073018 \(2013\)](#). (50+ citations)
47. "Mass Hierarchy Resolution in Reactor Anti-neutrino Experiments: Parameter Degeneracies and Detector Energy Response" **X. Qian** et al., [arXiv:1208.1551](#), [Phys. Rev. D87, 033005 \(2013\)](#). (70+ citations)
48. "Improved Measurement of Electron Antineutrino Disappearance at Daya Bay", Daya Bay Collaboration, [arXiv:1210.6327](#), [Chinese Phys. C37 011001 \(2013\)](#). (400+ citations)
49. "Statistical Evaluation of Experimental Determinations of Neutrino Mass Hierarchy", **X. Qian** et al. [arXiv:1210.3651](#), [Phys. Rev. D86, 113011 \(2012\)](#). (90+ citations)
50. "Density measurement through elastic electron scattering with gaseous target at Jefferson Lab", Y. Zhang, **X. Qian**, and B. T. Hu, [Chinese Physics C36, 610 \(2012\)](#).
51. "A side-by-side comparison of Daya Bay antineutrino detectors", Daya Bay Collaboration, [arXiv:1202.6181](#), [Nucl. Inst. Method A685 78 \(2012\)](#). (100+ citations)
52. "Observation of electron-antineutrino disappearance at Daya Bay", Daya Bay Collaboration, [arXiv:1203.1669](#), [Phys. Rev. Lett. 108, 171803 \(2012\)](#). (2000+ citations)
53. "Measurement of Double Spin Asymmetry  $A_{LT}$  in Semi-Inclusive Electroproduction of Charged Pion on a Transversely Polarized  ${}^3\text{He}$  Target", J. Huang et al., [arXiv:1108.0489](#), [Phys. Rev. Lett. 108, 052001 \(2012\)](#). (50+ citations)
54. "Single Spin Asymmetries in Charged Pion Production from Semi-Inclusive Deep Inelastic Scattering on a Transversely Polarized  ${}^3\text{He}$  Target", **X. Qian** et al., [arXiv:1106.0363](#), [Phys. Rev. Lett. 107, 072003 \(2011\)](#). (200+ citations)
55. "Transverse Momentum Dependent Parton Distribution/Fragmentation Functions at an Electro-Ion Collider" M. Anselmino et al., [arXiv:1101.4199](#), [Eur. Phys. J. A47, 35 \(2011\)](#).
56. "Near-threshold Photoproduction of  $\phi$ -Meson from Deuterium", **X. Qian** et al., [arXiv:1011.1305](#), [Phys. Lett. B696, 338 \(2011\)](#).
57. "Transverse Spin Structure of the Nucleon through Target Single Spin Asymmetry in Semi-Inclusive Deep-Inelastic  $(e, e' \pi^\pm)$  Reaction at Jefferson Lab" H. Gao et al., [arXiv:1009.3803](#), [Eur. Phys. J. Plus 126:2 \(2011\)](#). (50+ citations)
58. "Study of the  $A(e, e' \pi^\pm)$  Reaction on  ${}^1\text{H}$ ,  ${}^2\text{H}$ ,  ${}^{12}\text{C}$ ,  ${}^{27}\text{Al}$ ,  ${}^{64}\text{Cu}$  and  ${}^{197}\text{Au}$ ", **X. Qian** et al., [arXiv:0908.1616](#), [Phys. Rev. C81, 055209, \(2010\)](#).
59. "The extraction of  $\phi$ -N total cross section from  $d(\gamma, pK^+K^-)n$ ", **X. Qian** et al., [arXiv:0907.2668](#), [Phys. Lett. B680, 417 \(2009\)](#).
60. "Scaling study of the pion electro-production cross section and the pion form factor". T. Horn, **X. Qian** et al., [arXiv:0707.1794](#), [Phys. Rev. C78, 058201 \(2008\)](#). (60+ citations)
61. "Search for the  $\phi N$  bound state from  $\phi$  meson subthreshold production", S. Liska, H. Gao, W. Chen

and **X. Qian**, [arXiv:0707.1009](https://arxiv.org/abs/0707.1009), [Phys. Rev. C75, 058201 \(2007\)](https://doi.org/10.1146/annurev.nucl.012807.142801).

62. “Measurement of nuclear transparency for the  $A(e, e' \pi^+)$  reaction” B. Clasie, **X. Qian** et al., [arXiv:0707.1481](https://arxiv.org/abs/0707.1481), [Phys. Rev. Lett. 99, 242502 \(2007\)](https://doi.org/10.1103/PhysRevLett.99.242502). (60+ citations)
63. “The Kaon Form Factor in the Light-Cone Quark Model”, Bo-Wen Xiao, **X. Qian**, Bo-Qiang Ma. [Eur. Phys. J. A 15 523-527 \(2002\)](https://doi.org/10.1088/0954-3892/15/5/015).

### **PHYSICS REVIEWS (Major Contribution)**

1. “Reactor antineutrino flux and anomaly”, C. Zhang, X. Qian, M. Fallot, [arXiv:2310.13070](https://arxiv.org/abs/2310.13070), [Prog. Part. Nucl. Phys. 136, 104106 \(2024\)](https://doi.org/10.1088/1361-6471/acc106).
2. “Physics with Reactor Neutrinos”, **X. Qian** and Jen-Chieh Peng, [arXiv:1801.05386](https://arxiv.org/abs/1801.05386), [Rep. Prog. Phys. 82 036201 \(2019\)](https://doi.org/10.1088/0954-3892/82/3/036201).
3. “Long-Baseline Neutrino Experiments”, M. V. Diwan, V. Galymov, **X. Qian**, and A. Rubbia, [arXiv:1608.06237](https://arxiv.org/abs/1608.06237), [Annu. Rev. Nucl. Par. Sci. 66, 47-71 \(2016\)](https://doi.org/10.1146/annurev.nucl.012816.00006).
4. “Neutrino Mass Hierarchy”, **X. Qian** and P. Vogel, [arXiv:1505.01891](https://arxiv.org/abs/1505.01891), [Progress in Particle and Nuclear Physics, 83, 1-30 \(2015\)](https://doi.org/10.1088/0954-3892/83/1/013001). (50+ citations)
5. “Reactor Neutrino Experiments: theta13 and Beyond”, **X. Qian** and W. Wang, [arXiv:1405.7217](https://arxiv.org/abs/1405.7217), [Modern Phys. Lett. A29, 16, 1430016 \(2014\)](https://doi.org/10.1088/1361-6471/a2916).
6. “Neutrino Physics with JUNO”, F. P. An et al., [arXiv:1507.05613](https://arxiv.org/abs/1507.05613), [J. Phys. G: Nucl. Part. Phys. 43, 030401 \(2016\)](https://doi.org/10.1088/0954-3892/43/3/030401). (350+ citations)
7. “Single/Double-Spin Asymmetry Measurements of Semi-Inclusive Pion Electroproduction off a Transversely Polarized  $^3\text{He}$  Target Through Deep Inelastic Scattering” **X. Qian**, [arXiv:1206.1575](https://arxiv.org/abs/1206.1575), [Modern Phys. Lett. A27, 1230021 \(2012\)](https://doi.org/10.1088/1361-6471/a2716).

### **ADDITIONAL REFEREED JOURNAL PUBLICATION**

1. “Measurement of Ambient radon daughter decay rates and energy spectra in liquid argon using the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2307.03102](https://arxiv.org/abs/2307.03102), [Phys. Rev. D 109, 052007 \(2024\)](https://doi.org/10.1103/PhysRevD.109.052007).
2. “Final Measurement of the  $^{235}\text{U}$  Antineutrino spectrum with the PROSPECT-I Detector at HFIR”, PROSPECT collaboration, [arXiv:2212.10669](https://arxiv.org/abs/2212.10669), [Phys. Rev. Lett. 131, 021802 \(2023\)](https://doi.org/10.1103/PhysRevLett.131.021802).
3. “First measurement of quasi-elastic Lambda baryon production in muon antineutrino interactions in the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2212.07888](https://arxiv.org/abs/2212.07888), [Phys. Rev. Lett. 130, 231802 \(2023\)](https://doi.org/10.1103/PhysRevLett.130.231802).
4. “First demonstration of O(1 ns) timing resolution in MicroBooNE liquid argon time projection chamber”, MicroBooNE collaboration, [arXiv:2304.02076](https://arxiv.org/abs/2304.02076), [Phys. Rev. D108, 052010 \(2023\)](https://doi.org/10.1103/PhysRevD.108.052010).
5. “First double-differential measurement of kinematics imbalance in neutrino interactions with the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2301.03706](https://arxiv.org/abs/2301.03706), [Phys. Rev. Lett. 131, 101802 \(2023\)](https://doi.org/10.1103/PhysRevLett.131.101802).
6. “Multi-Differential Cross Section Measurements of Muon-Neutrino-Argon Quasielastic-like Reactions with the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2301.03700](https://arxiv.org/abs/2301.03700), [Phys. Rev. D108, 053002 \(2023\)](https://doi.org/10.1103/PhysRevD.108.053002).
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## **MANUSCRIPTS IN PROGRESS**

1. “Performance of a modular ton-scale pixel-readout liquid argon time projection chamber”, DUNE collaboration, [arXiv:2403.03212](https://arxiv.org/abs/2403.03212) (2024).
2. “First simultaneous measurement of differential muon-neutrino charged-current cross sections on argon for final states with and without protons using MicroBooNE data”, MicroBooNE collaboration, [arXiv:2402.19281](https://arxiv.org/abs/2402.19281) (2024).
3. “Inclusive cross section measurements in final states with and without protons for charged-current  $\mu$ -Ar scattering in MicroBooNE”, MicroBooNE collaboration, [arXiv:2402.19216](https://arxiv.org/abs/2402.19216) (2024).
4. “First measurement of the yield of  ${}^8\text{He}$  isotopes produced in liquid scintillator by cosmic-ray muons at Daya Bay”, Daya Bay collaboration, [arXiv:2402.05383](https://arxiv.org/abs/2402.05383) (2024).
5. “First search for dark-trident processes using the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2312.13945](https://arxiv.org/abs/2312.13945) (2023).
6. “Search for heavy neutral leptons in electron-positron and neutral-pion final states with the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2310.07660](https://arxiv.org/abs/2310.07660) (2023).
7. “Measurement of nuclear effects in neutron-argon interactions using generalized kinematic imbalance variables with the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2310.06082](https://arxiv.org/abs/2310.06082) (2023).
8. “First demonstration for a LArTPC-based search for intranuclear neutron-antineutron transitions and annihilation in  ${}^{40}\text{Ar}$  using MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2308.03924](https://arxiv.org/abs/2308.03924) (2023).
9. “Measurement of triple-differential inclusive muon-neutrino charged-current cross section on argon with the MicroBooNE detector”, MicroBooNE collaboration, [arXiv:2307.06413](https://arxiv.org/abs/2307.06413) (2023).
10. “First measurement of eta production in neutrino interactions on argon with MicroBooNE”, [arXiv:2305.16249](https://arxiv.org/abs/2305.16249) (2023).



11. “First Measurement of Differential Cross Sections for Muon Neutrino Charged Current Interactions on Argon with a Two-proton Final State in the MicroBooNE Detector”, MicroBooNE collaboration, [arXiv:2211.03734](https://arxiv.org/abs/2211.03734) (2022).

### **Other Contributions**

1. “The DUNE Far Detector Vertical Drift Technology, Technical Design Report”, DUNE collaboration, [arXiv:2312.03130](https://arxiv.org/abs/2312.03130) (2023).
2. “DUNE Offline Computing Conceptual Design Report”, DUNE collaboration, [arXiv:2210.15665](https://arxiv.org/abs/2210.15665) (2022).
3. “PROSPECT-II Physics Opportunities”, PROSPECT collaboration, [arXiv:2107.03934](https://arxiv.org/abs/2107.03934) (2021).
4. “White Paper on Light Sterile Neutrino Searches and Related Phenomenology”, [arXiv:2203.07323](https://arxiv.org/abs/2203.07323) (2022).
5. “A Gaseous Argon-Based Near Detector to Enhance the Physics Capabilities of DUNE”, [arXiv:2203.06281](https://arxiv.org/abs/2203.06281) (2022)
6. “Snowmass Neutrino Frontier: DUNE Physics Summary”, DUNE collaboration, [arXiv:2203.06100](https://arxiv.org/abs/2203.06100) (2022).
7. “DUNE Software and High Performance Computing”, B. Fleming et al, [arXiv:2203.06104](https://arxiv.org/abs/2203.06104) (2022).
8. “Cryogenic User Facilities for R&D on Noble Liquid Detectors and Low Temperature Devices”, [arXiv:2203.06146](https://arxiv.org/abs/2203.06146) (2022).
9. “Testing Lepton Flavor Universality and CKM Unitarity with Rare Pion Decays in the PIONEER experiment”, [arXiv:2203.05505](https://arxiv.org/abs/2203.05505) (2022).
10. “PIONEER: Studies of Rare Pion Decays”, PIONEER Collaboration, proposal approved by PSI, [arXiv:2203.01981](https://arxiv.org/abs/2203.01981) (2022).
11. “Physics Opportunities with PROSPECT-II”, PROSPECT collaboration, [arXiv:2202.12343](https://arxiv.org/abs/2202.12343) (2022).
12. “High-performance Generic Neutrino Detection in a LArTPC near the Earth’s Surface with the MicroBooNE Detector”, MicroBooNE collaboration, [arXiv:2012.07928](https://arxiv.org/abs/2012.07928) (2020).
13. “Experiment Simulation Configurations Approximating DUNE TDR”, DUNE collaboration, [arXiv:2103.04797](https://arxiv.org/abs/2103.04797) (2021).
14. “Note on arXiv:2005.05301 Preparation of the Neutrino-4 experiment on search for sterile neutrino and the obtained results of measurements”, PROSPECT and STEREO collaboration, [arXiv:2006.13147](https://arxiv.org/abs/2006.13147) (2020).
15. “Deep Underground Neutrino Experiment (DUNE) Near Detector Conceptual Design Report”, DUNE collaboration, [arXiv:2103.13910](https://arxiv.org/abs/2103.13910) (2021).
16. “DUNE Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume I Introduction to DUNE”, [arXiv:2002.02967](https://arxiv.org/abs/2002.02967), [JINST 15 T08008](https://arxiv.org/abs/2002.02967) (2020).
17. “Deep Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume II DUNE physics”, DUNE collaboration, [arXiv:2002.03005](https://arxiv.org/abs/2002.03005) (2020).
18. “Deep Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume III DUNE Far Detector Technical Coordination”, [arXiv:2002.03008](https://arxiv.org/abs/2002.03008), [JINST 15 T08009](https://arxiv.org/abs/2002.03008) (2020).
19. “Deep Underground Neutrino Experiment (DUNE), Far Detector Technical Design Report, Volume IV Far Detector Single-phase Technology”, [arXiv:2002.03010](https://arxiv.org/abs/2002.03010), [JINST 15, T08010](https://arxiv.org/abs/2002.03010) (2020).
20. “Response to Comment on Daya Bay’s definition and use of  $\Delta(m^2_{ee})$ ”, Daya Bay Collaboration, [arXiv:1905.03840](https://arxiv.org/abs/1905.03840) (2019).
21. “Unitarity Tests of the Neutrino Mixing Matrix”, X. Qian et al. [arXiv:1308.5700](https://arxiv.org/abs/1308.5700) (2013).
22. “A Second Detector Focusing on the Second Oscillation Maximum at an Off-axis Location to Enhance the Mass Hierarchy Discovery Potential in LBNE10”, X. Qian et al. [arXiv:1307.7406](https://arxiv.org/abs/1307.7406) (2013).
23. “The DUNE Far Detector Interim Design Report, Volume 1: Physics, Technology and Strategies”, DUNE collaboration, [arXiv:1807.10334](https://arxiv.org/abs/1807.10334) (2018).

24. “The DUNE Far Detector Interim Design Report, Volume 2: Single-Phase Module”, DUNE Collaboration, [arXiv:1807.10327 \(2018\)](#).
25. “The DUNE Far Detector Interim Design Report, Volume 3: Dual Phase Module”, DUNE Collaboration, [arXiv:1807.10340 \(2018\)](#).
26. “HEP Software Foundation Community White Paper Working Group – Detector Simulation”, HEP Software Foundation, [arXiv:1803.04165 \(2018\)](#).
27. “A Roadmap for HEP Software and Computing R&D for the 2020s”, A. A. Alves Jr, et al. [arXiv:1712.06982 \(2017\)](#).
28. “The Single-Phase ProtoDUNE Technical Design Report”, The DUNE Collaboration, [arXiv:1706.07081 \(2017\)](#).
29. “Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) Conceptual Design Report: Volume 1: The LBNF and DUNE Projects”, [arXiv:1601.05471 \(2016\)](#).
30. “Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) Conceptual Design Report Volume 2: The Physics Program for DUNE at LBNF” [arXiv:1512.06148 \(2015\)](#).
31. “Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) Conceptual Design Report: Volume 4: The DUNE Detectors at LBNF”, [arXiv:1601.02984 \(2016\)](#).
32. “The Intermediate Neutrino Program”, C. Adams et al. [arXiv:1503.06637 \(2015\)](#).
33. “A Proposal for a Three Detector Short-Baseline Neutrino Oscillation Program in the Fermilab Booster Neutrino Beam”, M. Antonello et al., [arXiv:1503.01520 \(2015\)](#).
34. “PROSPECT – A Precision Reactor Oscillation and Spectrum Experiment at Short Baselines”, J. Ashenfelter et al. [arXiv:1309.7647 \(2013\)](#).
35. “Opportunities for U.S. Contributions to JUNO”, a contribution to P5 (2014).
36. “LAr1-ND: Testing Neutrino Anomalies with Multiple LArTPC Detectors at Fermilab”, C. Adams et al., [arXiv:1309.7987 \(2013\)](#).
37. “Working Group Report: Neutrinos”, A. de Gouvea *et al.*, [arXiv:1310.4340 \(2013\)](#).
38. “Prospects for Precision Measurements with Reactor Antineutrinos at Daya Bay”, the Daya Bay collaboration, [arXiv:1309.7961 \(2013\)](#).
39. “The Long-Baseline Neutrino Experiment: Exploring Fundamental Symmetries of the Universe”, C. Adams et al., [arXiv:1307.7335 \(2013\)](#).
40. “Neutrino Mass Hierarchy Determination and Other Physics Potentials of Medium-baseline reactor Neutrino Oscillation Experiments”, A.B. Balantekin et al. [arXiv:1307.7419 \(2013\)](#).
41. “Electron Ion Collider: The Next QCD Frontier – Understanding the glue that binds us all” A. Accardi et al. [arXiv:1212.1701 \(2012\)](#).
42. “The 2010 Interim Report of the Long-Baseline Neutrino Experiment Collaboration Physics Working Groups” T. Akiri et al. LBNE Physics Potential Summary. [arXiv:1110.6249 \(2011\)](#).
43. “Gluons and the quark sea at high energies: distributions, polarization, tomography” D. Boer et al. Electron-Ion-Collider Summary. [arXiv:1108.1713 \(2011\)](#).
44. “Transversity and Transverse Spin in Nucleon Structure through SIDIS at Jefferson Lab” A. Afanasev et al. JLAB-PHY-07-620, Mar 2007. 7pp [arXiv:hep-ph/0703288 \(2007\)](#).

## **PROCEEDINGS**

1. “A novel method for event reconstruction in Liquid Argon Time Projection Chamber”, M. Diwan, M Potekhin, B. Viren, X. Qian and C. Zhang, Journal of Physics: Conference Series, Volume 762, Number 1, (2016).
2. “Signal Processing in the MicroBooNE LArTPC”, Jyoti Joshi and X. Qian, [arXiv:1511.00317 \(2015\)](#).
3. “Improved Measurement of Electron Antineutrino Disappearance at Daya Bay” X. Qian, on behalf of the Daya Bay, Proceeding to NuFact12, [arXiv:1211.0570](#).
4. “Transverse Single Spin Asymmetry Measurements from Semi-inclusive Deep Inelastic Scattering at

- an Electron Ion Collider” M. Huang et al. DIS 2011 “The SoLID-Spin Experiment at 11 GeV JLab”  
**X. Qian** et al. DIS 2011.
5. “Future (transverse) Spin Physics at Jefferson Lab” H. Gao et al. J. Phys. Conf. Ser. 295, 012019 (2011).
  6. “Study of Semi-inclusive Deep-Inelastic ( $e, e' \pi^\pm$ ) production at 11 GeV in JLab with a polarized  $^3\text{He}$  target”, **X. Qian**, H. Gao, J.-P. Chen and E. Chudakov, AIP Conf. Proc. 1149, 457 (2009).
  7. “Neutron transversity measurement at Jefferson Lab with a polarized He-3 target” H. Gao, **X. Qian** et al. Few Body Syst. 41:43-52 (2007).

## **INVITED CONFERENCE TALKS**

1. “LArTPC Electromagnetic Shower Reconstruction”, 2<sup>nd</sup> Short-Baseline Experiment-Theory Workshop, April 2<sup>nd</sup>-5<sup>th</sup> 2024.
2. “Wiener-SVD data unfolding and model validation”, NuXTRACT workshop, Toward a consensus in neutrino cross sections, CERN, Oct 2-6<sup>th</sup> 2023.
3. “The Deep Underground Neutrino Experiment”, The 29th International Workshop on Weak Interactions and Neutrinos, Zhuhai, China, July 3-8, 2023.
4. “Exploring Neutrino Interaction Physics with MicroBooNE”, 13<sup>th</sup> International Workshop on Neutrino-Nucleus Interactions in the Few GeV Regions, Seoul, Korea, Oct 24-29, 2022.
5. “Proposal of An Alternative Active Target Design based on PIN”, Rare Pion Decay Workshop, University of California Santa Cruz, Oct 6-8<sup>th</sup> 2022.
6. “PIONEER: a next-generation pion decay experiment”, on behalf of the PIONEER collaboration, invited talk in Snowmass rare and precision measurements Frontier Spring Meeting, May 17<sup>th</sup> 2022.
7. “Advancement of LArTPC technology in Neutrino Physics from MicroBooNE”, on behalf of the MicroBooNE collaboration, invited plenary talk in DUNE collaboration meeting, Jan 28<sup>th</sup> 2022.
8. “Search for an Anomalous Excess in Neutrino-Induced Interactions in the MicroBooNE Liquid Argon Time Projection Chamber”, NYC, APS April meeting, 2021.
9. “Experimental Overview of Reactor Neutrinos”, International Conference on Neutrinos and Dark Matter (NDM-2020), Jan 13<sup>th</sup>, 2020.
10. “Projective Charge Readout: Number of Views and Orientation”, Module of Opportunity Workshop for DUNE, BNL, November 13<sup>th</sup>, 2019.
11. “LArTPC Charge-Light Matching and PID with Wire-Cell”, Reconstruction and Machine Learning in Neutrino Experiments, DESY, Hamburg, Sep 16<sup>th</sup> 2019.
12. “Review of Linear Algebra Applications in Some Neutrino Experiments”, PHYSTAT-nu 2019 @ CERN, Jan 24<sup>th</sup>, 2019.
13. “Wire-Cell Reconstruction: Status and Recent Progress”, Dec 11<sup>th</sup>, 2018, Workshop on Calibration and Reconstruction for LArTPCs @ FNAL.
14. “Algorithmic Enhancement of Reconstruction”, 2018, Pixel LArTPC Summer meeting, ANL.
15. “Wiener-SVD Unfold”, Viet Nus Workshop, 2017, Quy Nhon, Vietnam.
16. “Search for Sterile Neutrinos using Reactor Neutrinos”, Viet Nus Workshop, 2017, Quy Nhon, Vietnam.
17. “Cold Electronics Performance in MicroBooNE”, CPAD, Oct 8<sup>th</sup>, 2016 Caltech, Pasadena, CA.
18. “Challenges of LArTPC reconstruction in DUNE”, CPAD, Oct 8<sup>th</sup>, 2016 Caltech, Pasadena, CA.
19. “Statistical Methods used in Reactor Neutrino Experiments”, Sep. 20<sup>th</sup>, 2016, FNAL, PHYSTAT Workshop.
20. “TPC Signal Processing”, June 28<sup>th</sup>, 2016, CERN, protoDUNE science workshop.
21. “Wire Cell Reconstruction”, June 28<sup>th</sup>, 2016, CERN, protoDUNE science workshop.
22. “TPC Physics”, July 18<sup>th</sup>, 2016, BNL, cold electronics summer school.
23. “Wire Cell technique, current performance of prototype code and remaining algorithm-level problems”, DUNE Wire-Cell Reconstruction Summit, LBNL, Dec 7<sup>th</sup>, 2015.
24. “Challenges and Opportunities in understanding neutrino properties with accelerator-based

- experiments”, DBD14, Pre-meeting of joint APS-JPS DNP meeting, Big Island, Hawaii, Oct 5<sup>th</sup>, 2014.
25. “Constraints from the LAr Test Beam Efforts”, CETUP14, Lead, South Dakota, July 17<sup>th</sup>, 2014.
  26. “Recent Results from Daya Bay”, Blois 2014, Blois, France, May 20<sup>th</sup>, 2014.
  27. “Long-Baseline Neutrino Experiment”, Miami 2013, Fort Lauderdale, FL, Dec 13<sup>th</sup>, 2013.
  28. “Determination of Mass Hierarchy from Man-Made Neutrinos: Future Projects”, Intensity Frontier Neutrino Subgroup Workshop, SLAC, CA, March 6<sup>th</sup>, 2013.
  29. “Nucleon Transverse Spin Studies at Jefferson Lab”, Gordan Research Conference Photonuclear Reaction, Holderness, NH, August 6<sup>th</sup>, 2012.
  30. “Improved Measurement of Electron Antineutrino Disappearance of Daya Bay”, NuFact 12, Williamsburg, VA, July 25<sup>th</sup>, 2012.
  31. “Single and Double Spin Asymmetries for a Semi-Inclusive Pion Electro-production from a Transversely Polarized  $^3\text{He}$  Target” APS April Meeting, Atlanta, March 31<sup>st</sup>, 2012.
  32. “Electro-production of  $J/\psi$  in Hall A at 11 GeV with SoLID” Non-Perturbative Color Forces in QCD, Temple University, Philadelphia, March 27<sup>th</sup>, 2012.
  33. “Light Collectors in WCSim and Discussions on their Impact” Water Cerenkov Reconstruction Workshop, Fermi-lab, Dec 13<sup>th</sup>, 2011.
  34. “Preliminary Studies of Light Collector’s impact on Water Cerenkov Reconstruction” Advances in Neutrino Technology 2011, Drexel University, Philadelphia, Oct 12<sup>th</sup>, 2011.
  35. “SoLID-Spin Program at 12 GeV JLab” The 3rd workshop on Hadron Physics in China and Opportunity in US, Aug 8<sup>th</sup>, 2011 Shandong University, Weihai, China.
  36. “New Results from Neutron Transversity Experiment at Jefferson Lab” The 7th Joint Meeting of Chinese Physicists Worldwide International Conference on Physics Education and Frontier Physics, Aug 2<sup>nd</sup>, 2011, Kaohsiung, Taiwan.
  37. “Simulation of Light Collectors and Preliminary Comparison Results” 2011 LBNE Water Cerenkov Workshop, Fermi-lab, Chicago, IL, July 12<sup>th</sup>, 2011.
  38. “Neutron Transversity: Current Status and the Future”, 2011 Jefferson Lab Users Group Meeting, Newport News, VA, June 7<sup>th</sup>, 2011.
  39. “Physics Program with 12 GeV Jefferson Lab”, The 3rd Asian Nuclear Physics Association Symposium, Lanzhou China, April 30<sup>th</sup>, 2011.
  40. “SIDIS with Polarized  $^3\text{He}$  and SoLID at 11 GeV JLab”, International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS2011), April 12<sup>th</sup>, 2011.
  41. “Simulation of Single Spin Asymmetries from SIDIS at an EIC” International Electron-Ion Collider Collaboration Meeting, Catholic University of America, July 29<sup>th</sup>, 2010.
  42. “BigBite Wire Chamber Calibration, Tracking and Optics” JLab Hall A Analysis Workshop, Dec. 14<sup>th</sup>, 2009.
  43. “The Study of Semi-Inclusive  $^3\text{He}(e,e'h)$  Reaction at 11 GeV in JLab Hall A”, The 18th International Symposium on Spin Physics, Oct. 9<sup>th</sup>, 2008.
  44. “Photo- $\phi$  Production on Deuteron from  $\gamma(d, pK^+ K^-)n$  Process”, CLAS Collaboration meeting, May 30<sup>th</sup>, 2008.
  45. “PionCT experiment”, Jefferson Lab Hall C Collaboration Meeting, Jan 24<sup>th</sup>, 2007.

## **PHYSICS SEMINARS**

1. “PIONEER: a next-generation pion decay experiment”, Argonne National Laboratory, MEP seminar series, August 22<sup>nd</sup> 2023.
2. “Reactor Neutrino”, BNL, lecture given @ Pathway Fermilab and Brookhaven Summer School -BNL Neutrino Week, July 27<sup>th</sup> 2023.

3. "PIONEER: a next-generation pion decay experiment", Institute of High-Energy Physics (IHEP), Beijing, China, July 10<sup>th</sup> 2023.
4. "PIONEER: a next-generation pion decay experiment", Tsinghua University, Beijing, China, July 3<sup>rd</sup>, 2023.
5. "Measurement of Energy-dependent Inclusive Neutrino Charged-current Cross Sections at MicroBooNE", Northwestern University, May 23<sup>rd</sup> 2022.
6. "Development of Wire-Cell Event Reconstruction for LArTPCs in Neutrino Physics", University of Chicago, Feb 28<sup>th</sup>, 2022.
7. "Search for an Anomalous Excess in Neutrino-Induced Interactions in the MicroBooNE Liquid Argon Time Projection Chamber", Institute of physics of 2 infinities of Lyon, IN2P3, Dec 10<sup>th</sup>, 2021.
8. "Search for an Anomalous Excess in Neutrino-Induced Interactions in the MicroBooNE Liquid Argon Time Projection Chamber", IIT Delhi India, Dec 3<sup>rd</sup>, 2021.
9. "Search for an Anomalous Excess in Neutrino-Induced Interactions in the MicroBooNE Liquid Argon Time Projection Chamber", joint seminar of Shanghai Jiao Tong University and T. D. Lee Institute, Nov 23<sup>rd</sup>, 2021.
10. "Search for an Anomalous Excess in Neutrino-Induced Interactions in the MicroBooNE Liquid Argon Time Projection Chamber", Princeton University, Nov 11<sup>th</sup>, 2021.
11. "Review of Linear Algebra Applications in Some Recent Neutrino Experiments", BNL, July 31<sup>st</sup>, 2020.
12. "Review of Linear Algebra Applications in Some Neutrino Experiments", UIUC, Urbana, Feb 10<sup>th</sup>, 2020.
13. "Development of LArTPC for Neutrino Physics", Stony Brook University, New York, Sep 9<sup>th</sup>, 2019.
14. "Introduction to Statistics in Particle Physics", BNL, July 19<sup>th</sup>, 2019.
15. "Development of LArTPC for Neutrino Physics", LBNL, Oct. 11<sup>th</sup>, 2018.
16. "Development of LArTPC for Neutrino Physics", UC Irvine, Irvine, CA, Oct. 3<sup>rd</sup>, 2018.
17. "Development of LArTPC for Neutrino Physics", Caltech, Pasadena, CA, Oct. 1<sup>st</sup>, 2018.
18. "Introduction to Statistics in Particle Physics", BNL, July 17<sup>th</sup>, 2018.
19. "Development of LArTPC for Neutrino Physics", UIUC, Urbana, September 17<sup>th</sup>, 2017.
20. "Development of LArTPC for Neutrino Physics", SUN YAT-SEN University, May. 16<sup>th</sup>, 2017.
21. "Development of LArTPC for Neutrino Physics", Tsinghua University, Beijing, Dec. 16<sup>th</sup>, 2016.
22. "Development of LArTPC for Neutrino Physics", IHEP, Beijing, Dec. 13<sup>th</sup>, 2016.
23. "The Daya Bay Experiment", Fermilab Neutrino Seminar, FNAL, Batavia, USA, Oct 15<sup>th</sup>, 2015.
24. "Neutrino Oscillation: Daya Bay Experiment and Beyond", Collider and Accelerator Division, BNL, Upton, USA, Sep. 10<sup>th</sup>, 2014.
25. "The Long Baseline Neutrino Experiment", Tsinghua University, Beijing, P. R. China, Jan 3<sup>rd</sup> 2014.
26. "Neutrino Oscillation: the Daya Bay Experiment and Beyond", China Institute of Atomic Energy, Beijing, P. R. China, Jan 6<sup>th</sup>, 2014.
27. "Neutrino Oscillation: the Daya Bay Experiment and Beyond", Brookhaven National Lab, NY, USA, Feb 15<sup>th</sup>, 2013.
28. "Overview of the JLab SoLID Physics Program", Triangle Universities Nuclear Laboratory, Duke University, Durham, USA, Feb 14<sup>th</sup>, 2013.
29. "Neutrino Oscillation: the Daya Bay Experiment and Beyond", Kellogg Radiation Lab, California Institute of Technology, Pasadena, USA, Feb 6<sup>th</sup>, 2013.
30. "Improved Measurement of Electron Antineutrino Disappearance at Daya Bay", University of California-Los Angeles, USA, Nov 7<sup>th</sup>, 2012.
31. "Challenges and Statistics in Resolving the Neutrino Mass Hierarchy" Tsinghua University, China, Oct 9<sup>th</sup>, 2012.
32. "Overview of SoLID physics program", Institute of Modern Physics, Chinese Academy of Sciences, China, Sep 11<sup>th</sup>, 2012.
33. "Neutrino Oscillation: Daya Bay Experiment", Institute of Modern Physics, Chinese Academy of Sciences, China, Sep 10<sup>th</sup>, 2012.



34. "Observation of Electro-antineutrino Disappearance at Daya Bay", University of California-Irvine, USA, April 25th, 2012.
35. "Single-Spin Asymmetry Measurement with Polarized  $^3\text{He}$ ", University of California-Los Angeles, USA, Jan 11th, 2012.
36. "Neutrino Oscillation: Daya Bay and LBNE", University of Illinois at Urbana-Champaign, USA, Oct 4th, 2011.
37. "Neutrino Oscillation: Daya Bay and LBNE", Hall A, Jefferson Lab, USA, Sep 29th, 2011.
38. "Single Spin Asymmetry Measurement with Polarized  $^3\text{He}$ ", University of Illinois at Urbana-Champaign, USA, July 28th, 2011.
39. "Single Spin Asymmetry Measurement with Polarized  $^3\text{He}$ ", Caltech, USA, March 7th, 2011.
40. "Single Spin Asymmetry Measurement with Polarized  $^3\text{He}$ ", Lawrence Berkeley National Laboratory, USA, Feb 8th, 2011.
41. "Long Baseline Neutrino Experiment", University of Science and Technology of China, China, Dec 29th, 2010.
42. "Long Baseline Neutrino Experiment", Lanzhou University, China, Dec 27th, 2010.
43. "Long Baseline Neutrino Experiment", Shanghai Jiao Tong University, China, Dec 24th, 2010.
44. "Long Baseline Neutrino Experiment", Peking University, China, Dec 15th, 2010.
45. "Long Baseline Neutrino Experiment", Tsinghua University, China, Dec 14th, 2010.
46. "Single-Spin Asymmetry Measurement at Jefferson Lab Hall A with a Polarized  $^3\text{He}$  Target", Kellogg Radiation Lab, Caltech, USA, Oct 9th, 2009.

### **PHYSICS COLLOQUIUM**

1. "Search for an Anomalous Excess in Neutrino-Induced Interactions in the MicroBooNE Liquid Argon Time Projection Chamber", BNL, Upton, USA, Oct 28<sup>th</sup>, 2021.
2. "Development of LArTPCs for Neutrino Physics", BNL, Upton, USA, March 19<sup>th</sup>, 2019.
3. "Seeking the Origin of Asymmetry", Sambamurti Lecture, BNL, Upton, USA, July 21<sup>st</sup>, 2015.
4. "Neutrino Oscillation: Daya Bay Experiment and Beyond", BNL, Upton, USA, Aug. 26<sup>th</sup>, 2014.
5. "Neutrino Oscillation: the Daya Bay Experiment and Beyond", Duke University, Durham, USA, Feb 13<sup>th</sup>, 2013.
6. "Neutrino Oscillation: the Daya Bay Experiment and Beyond", North Carolina State University, USA, Feb 11<sup>th</sup>, 2013.