

## **KYUNGSEON JOO**

University of Connecticut  
Department of Physics  
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Storrs, CT 06269  
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### **Education**

Massachusetts Institute of Technology, Cambridge, MA  
Ph.D., Physics, June 1997

University of Utah, Salt Lake City, UT  
M.S., Electrical and Computer Engineering

Seoul National University, *Seoul*, South Korea  
B.S., Physics

### **Professional Positions**

Full Professor, 2011 – present  
University of Connecticut, Department of Physics, Storrs, CT

Visiting Professor, Summer, 2019  
Universität Gießen, Gießen, Germany

Fulbright Scholar and Visiting Professor, 2015 – 2016  
University of Paris-Sud, IPN-Orsay, Orsay, France

Program Manager (IPA), 2013 – 2015  
Department of Energy (DOE), Office of Science, Washington, DC

Visiting Professor, 2012 – 2013  
Department of Physics, George Washington University, Washington, DC

Program Director of Nuclear Physics (IPA), 2010 – 2012  
National Science Foundation (NSF), Arlington, VA

Associate Professor of Physics, 2007 – 2011  
University of Connecticut, Storrs, CT

Visiting Professor, 2007  
RCNP, Osaka University

Assistant Professor of Physics, 2002 – 2007  
University of Connecticut, Storrs, CT

Postdoctoral Fellow, 2000 – 2002  
Jefferson Lab, Newport News, VA

Postdoctoral Associate, 1997 – 2000  
University of Virginia, Charlottesville, VA

### **Synergetic Activities**

Director, US-Japan Hadronic Physics Exchange Program, 2020 - present

Chair, The CLAS Collaboration, 2019 – 2021

President, Association of Korean Physicists in America (AKPA), 2019 – 2021

Fulbright Scholar, 2015-2016

Department of Energy's Office of Science Appreciation Award, 2015

**Current Research Associates supervised (2 research scientist and 2 postdocs)**

A. Kim (Research Scientist), S. Diehl (Research Scientist jointly appointed with U. Giessen), Y. Wunderlich (Postdoc)

**Current Ph.D. Students supervised (8 Ph.D. students)**

M. Bilakhia, A. Bulgakov, R. Capobianco, A. Illari, G. Kainth, J. Richards, R. Santos, N. Trotta

**Former Ph.D. Students**

V. Kliencko (Ph.D., 2024) Postdoc, Argonne National Lab.

T. O'Connell (Ph.D., 2022) Teaching Professor, University of Connecticut

K. Wei (Ph.D., 2021) Staff Scientist at Honeywell Inc.

B. Clary (Ph.D., 2020, Postdoc, Lawrence Livermore National Lab)

K. Tezgin (Ph.D., 2020, Postdoc, Brookhaven National Lab)

F. Cao (Ph.D., 2019, Data Scientist, MORSE Corps.).

D. Riser (Ph.D., 2019, Data Scientist, US-Department of Defense).

N. Harrison (PhD, 2015, Assistant Professor at the U. of North Georgia, Oakwood, GA).

T. Mineeva (PhD, 2013, Assistant Professor at the U. Santa Maria, Valparaíso, Chile).

E. Seder (PhD, 2013, Research Scientist at Ericsson Research, Pisa, Italy).

W. Gohn (PhD, 2013, Senior Scientist at Siemens, Chicago, IL).

I. Shin (PhD, 2012, Staff Scientist at Institute of Basic Science in South Korea).

N. Markov (PhD, 2012, Senior Scientist, Canon Medical Research Center, Vernon Hills, IL).

B. Zhao (PhD, 2008, Research Scientist at Nanometrics, Austin, TX).

**Former Postdocs**

M. Ungaro (Staff Scientist at Jefferson Lab).

U. Shrestha (Fermi National Lab).

S. Diehl (Research Scientist jointly appointed with U. Giessen and U. of Connecticut)

A. Kim (Research Professor at U. of Connecticut).

N. Markov (Senior Scientist at Siemens).

D. Riser (Data Scientist, US-Department of Defense).

F. Cao (Data Scientist, MORSE Corps.).

E.L. Isupov (Staff Scientist, Moscow State University).

N. Sato (Staff Scientist, Jefferson Lab).

**Currently Active Extramural Grants (5 Grants)**

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$1.645 M**, 04/15/2022 - 05/31/2025, K. Joo (Sole PI).

DOE/Argonne National Lab, "SIDIS Pion Electroproduction with CLAS12," - **\$320 K**, 01/01/2021 – 12/31/2025, K. Joo (Sole PI).

DOE/Argonne National Lab, "ePIC Detector Development," - **\$140 K**, 01/01/2023 – 12/31/2025, K. Joo (Sole PI).

DOE Office of Science's Quantum Information Science Program, "Workshop on Nuclear Physics and Quantum Information Science," – **\$24,000**, 09/01/2019 – 02/28/2025, K. Joo (PI), R. Cote (Co-PI).

#### **Past Extramural Grants**

DOE Office of Science's Medium Energy Nuclear Physics Program grant, "U.S.-Japan Hadronic Physics International Program for Studies of Hadron Structure and QCD," **\$231 K**, 09/15/2020 – 09/14/2023, K. Joo (Sole PI)

DOE Office of Science's Quantum Information Science Program, "Workshop on Nuclear Physics and Quantum Information Science," – **\$24 K**, 09/01/2019 – 08/31/2023, K. Joo (PI), R. Cote (Co-PI).

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$1.41 M**, 04/15/2019 - 04/14/2022, K. Joo (Sole PI).

DOE Office of Science's Medium Energy Nuclear Physics Program grant, "U.S.-Japan Hadronic Physics International Program for Studies of Hadron Structure and QCD," **\$231 K**, 09/15/2020 – 09/14/2023, K. Joo (Sole PI)

National Science Foundation (NSF) IRES Program, "Studying Nucleon Structure in Orsay, France," - \$248 K, 06/01/2017 – 08/31/2023, Peter Schweitzer (PI), Kyungseon Joo (Co-PI), Gail Dodge (Co-PI).

National Science Foundation (NSF) Campus Cyberinfrastructure (CC) Program, "Shared Computing Infrastructure for Large-scale Science Problems," – **\$400 K**, 08/01/2019 – 07/31/2022, R. Jones (PI), K. Joo (Co-PI), C. Battersby (Co-PI), V. Cormier (Co-PI), J. Yan (Co-PI).

DOE/Brookhaven National Lab Electron Ion Collider (EIC) Detector R&D Program, "EIC Background Studies and the Impact on the IR and Detector Design," – **\$100 K**, 01/01/2018 – 12/31/2021, L. Elouadrhiri (PI, Jefferson Lab), C. Hyde (Co-PI, Old Dominion U.), K. Joo (Co-PI).

DOE/Jefferson Science Associate, "Computational Framework for TMDs," – **\$62 K**, 11/01/2019 – 10/31/2021, Peter Schweitzer (PI), K. Joo (Co-PI).

DOE/Jefferson Science Associate, "HD-ice Transversely Polarized Target Development," - **\$109 K**, 11/14/13 – 09/30/16, K. Joo (Sole PI).

DOE/Jefferson Science Associate, "High Threshold Cherenkov Counter and Ring Imaging Cherenkov Counter with CLAS 12," - **\$104 K**, 11/01/12 – 09/30/16, K. Joo (Sole PI).

DOE/Argonne National Lab, "Electroproduction with Nucleon and Nuclear Targets Using CLAS," - **\$128 K**, 01/11/16 – 05/30/18, K. Joo (Sole PI).

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$1.15 M**, 04/15/2016 - 04/14/2021, K. Joo (Sole PI).

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$712 K**, 04/15/2013 - 04/14/2016, K. Joo (Sole PI).

DOE Office of Science's Office of Nuclear Physics, "IPA in Nuclear Physics," – **\$413 K**, 03/04/2013 - 08/30/2015, K. Joo (Sole PI).

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$765 K**, 04/15/2010 - 04/14/2013, K. Joo (Sole PI).

National Science Foundation, "IPA in Nuclear Physics," – **\$373 K**, 08/02/2010 - 08/30/2012, K. Joo (Sole PI).

DOE/Jefferson Science Associate, "High Threshold Cherenkov Counter and Ring Imaging Cherenkov Counter with CLAS 12," - **\$260 K**, 01/01/12 – 12/31/16, K. Joo (Sole PI).

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$615 K**, 04/15/2007 - 04/14/2010, K. Joo (Sole PI).

DOE Office of Science's Medium Energy Nuclear Physics Program, "Medium Energy Nuclear Physics Experiment in Hall B at Jefferson Lab," – **\$252 K**, 04/15/2004 - 04/14/2007, K. Joo (Sole PI).

CyberConnect EZ via DOE SBIR/STTR Program, "Development of Computational Framework for Nuclear Physics Data Analysis," – **\$30 K**, 06/28/06 - 07/13/07, K. Joo (Sole PI).

### **Selected University/Community Services**

Dean's Promotion, Tenure and Review (PTR) Committee (2020 - 2023)

Physics Department Promotion, Tenure and Review (PTR) Committee (2021 – 2024)

J-PARC Accelerator Program Advisory Committee, KEK, Japan (2022 – 2027)

Review Committee for Research Excellence Program (2020 – 2023)

Award Nomination Committee Chair (2017 – 2022)

Career Leadership Committee (2014-17)

### **Jefferson Lab PAC Approved Experiments as a Spokesperson**

#### **A. 12 GeV Experiments**

1. JLAB-E12-06-112: "Probing the Proton's Quark Dynamics in Semi-Inclusive Pion Production at 12 GeV," K. Joo (co-spokesperson).
2. JLab-C12-11-111, "Transverse spin effects in SIDIS at 11 GeV with a transversely polarized target using the CLAS12 Detector," K. Joo (co-spokesperson).
3. JLab-E12-09-008, "Studies of the Boer-Mulders Asymmetry in Kaon Electroproduction with Hydrogen and Deuterium Targets," K. Joo (co-spokesperson).
4. JLAB-E12-06-117: "Quark Propagation and Hadron Formation in  $\pi^0$  and  $\eta$  channels," K. Joo (co-spokesperson).
5. JLAB-E12-09-003: "Nucleon Resonance Studies with CLAS12," K. Joo (co-spokesperson).
6. JLAB-E12-06-108: "Hard Exclusive Electroproduction of  $\pi^0$  and  $\eta$  with CLAS12," K. Joo (co-spokesperson).
7. JLAB-E12-06-117A, "Di-hadron measurements in electron-nucleus scattering with CLAS12," – K. Joo (co-spokesperson) et al.

#### **B. 6 GeV Experiments**

1. JLAB-PR-05-114: "Deeply Virtual Compton Scattering at 6 GeV with polarized target and polarized beam using the CLAS detector," K. Joo (co-spokesperson).
2. JLAB-PR-04-116: "Beyond Born Approximation: A Precise Comparison of Positron-Proton and Electron-Proton Elastic Scattering in CLAS," K. Joo (co-spokesperson).
3. JLAB-PR-01-103: "Single Pion Production in the Resonance Region at Low  $Q^2$ ," K. Joo (co-spokesperson).
4. JLAB-PR-00-112: "Exclusive Kaon Production in Hall B at 6 GeV," K. Joo (co-spokesperson).
5. JLAB-PR-99-006: "Polarization Observables in  $H(e,e'K^+)\Lambda$ ," K. Joo (co-spokesperson).

### List of refereed journal publications

1. I. A. Skorodumina *et al.* (CLAS Collaboration), "Double-Pion Electroproduction off Protons in Deuterium: Quasi-Free Cross Sections and Final State Interactions", *Phys. Rev. C* 109, 065205 (2024).
2. A. Kim *et al.* (CLAS Collaboration), "Beam Spin Asymmetry Measurements of Deeply Virtual  $\pi^0$  Production with CLAS12", *Phys. Lett. B* 849, 138459 (2024).
3. S. Paul *et al.* (CLAS Collaboration), "Alignment of the CLAS12 Central Hybrid Tracker with a Kalman Filter", *Nucl. Inst. and Meth. A* 1049, 168032 (2023).
4. C. Kim *et al.* (CLAS Collaboration), "Measurements of the Helicity Asymmetry  $E$  for the  $\gamma p \rightarrow p \pi^0$  Reaction in the Resonance Region", *Eur. Phys. J. A.* 59, 217 (2023).
5. S. Diehl *et al.* (CLAS Collaboration), "First Measurement of Hard Exclusive  $\pi^- \Delta^{++}$  Electroproduction Beam Spin Asymmetries off the Proton", *Phys. Rev. Lett.* 131, 021901 (2023).
6. I. Korover *et al.* (CLAS Collaboration), "Observation of Large Missing-Momentum ( $e,e'p$ ) Cross-Section Scaling and the Onset of Correlated-Pair Dominance in Nuclei", *Phys. Rev. C* 107, L061301 (2023).
7. G. Christiaens *et al.* (CLAS Collaboration), "First CLAS12 Measurement of DVCS Beam-Spin Asymmetries in the Extended Valence Region", *Phys. Rev. Lett.* 130, 211902 (2023).
8. T. Chetry *et al.* (CLAS Collaboration), "First Measurement of  $\Lambda$  Electroproduction off Nuclei in the Current and Target Fragmentation Regions", *Phys. Rev. Lett.* 130, 14 (2023).
9. S. Diehl *et al.* (CLAS Collaboration), "A Multidimensional Study of the Structure Function Ratio  $\sigma_{LT}/\sigma_0$  from Hard Exclusive  $\pi^+$  Electroproduction off Protons in the GPD Regime", *Phys. Lett. B* 839, 137761 (2023).
10. H. Avakian *et al.* (CLAS Collaboration), "Observation of Correlations Between Spin and Transverse Momenta in Back-to-Back Dihadron Production at CLAS12", *Phys. Rev. Lett.* 130, 022501 (2023).
11. Y. Tian *et al.* (CLAS Collaboration), "Exclusive  $\pi^-$  Electroproduction off the Neutron in Deuterium in the Resonance Region", *Phys. Rev. C* 107, 015201 (2023).
12. S. Paul *et al.* (CLAS Collaboration), "Observation of Azimuth-Dependent Suppression of Hadron Pairs in Electron Scattering off Nuclei", *Phys. Rev. Lett.* 129, 182501 (2022).
13. D.S. Carman *et al.* (CLAS Collaboration), "Beam-Recoil Transferred Polarization in  $K+Y$  Electroproduction in the Nucleon Resonance Region with CLAS12", *Phys. Rev. C* 105, 065201 (2022).
14. N. Zachariou *et al.* (CLAS Collaboration), "Beam-Spin Asymmetry  $\Sigma$  for  $\Sigma^-$  Hyperon Photoproduction off the Neutron", *Phys. Lett. B* 827, 136985 (2022).

15. E.L. Isupov et al. (CLAS Collaboration), "Polarized Structure Function  $\sigma_{LT}'$  from  $\pi^0 p$  Electroproduction Data in the Resonance Region at  $0.4 < Q^2 < 1.0 \text{ GeV}^2$ ", Phys. Rev. C 105, L022201 (2022).
16. S. Diehl et al. (CLAS Collaboration), "Multidimensional, High Precision Measurements of Beam Single Spin Asymmetries in Semi-Inclusive  $\pi^+$  Electroproduction off Protons in the Valence Region", Phys. Rev. Lett. 128, 062005 (2022).
17. S. Moran et al. (CLAS Collaboration), "Measurement of Charged Pion Production in Deep-Inelastic Scattering off Nuclei with the CLAS Detector", Phys. Rev. C 105, 015201 (2022).
18. J. Rowley et al. (CLAS Collaboration), "Improved  $\Lambda p$  Elastic Scattering Cross Sections Between 0.9 and 2.0 GeV/c and Connections to the Neutron Star Equation of State", Phys. Rev. Lett. 127, 272303 (2021).
19. P. Chatagnon et al. (CLAS Collaboration), "First-time Measurement of Timelike Compton Scattering", Phys. Rev. Lett. 127, 262501 (2021).
20. M. Khachatryan et al. (CLAS Collaboration), "Electron Beam Energy Reconstruction for Neutrino Oscillation Measurements", Nature 599, 565 (2021).
21. R. Dupre et al. (CLAS Collaboration), "Measurement of Deeply Virtual Compton Scattering off Helium-4 with CLAS at Jefferson Lab", Phys. Rev. C 104, 025203 (2021).
22. I. Korover et al. (CLAS Collaboration), " $^{12}\text{C}(e, e'pN)$  Measurements of Short Range Correlations in the Tensor-to-Scalar Nucleon-Nucleon Interaction Transition Region", Phys. Lett. B 820, 136523 (2021).
23. N. Zachariou et al. (CLAS Collaboration), "Double Polarization Observable  $G$  for Single Pion Photoproduction from the Proton", Phys. Lett. B 817, 136304 (2021).
24. X. Zheng et al. (CLAS Collaboration), "Measurement of the Proton Spin Structure at Long Distances", Nature Physics 17, 6 (2021).
25. T.B. Hayward *et al.* (CLAS Collaboration), "Observation of Beam Spin Asymmetries in the Process  $e p \rightarrow e \pi^+ \pi^- X$  with CLAS12", Phys. Rev. Lett. 126, 152501 (2021).
26. M. Carver et al. (CLAS Collaboration), "Photoproduction of the  $f_2(1270)$  Meson Using the CLAS Detector", Phys. Rev. Lett. 126, 082002 (2021).
27. U. Shrestha et al. (CLAS Collaboration), "Differential Cross Sections for  $\Lambda(1520)$  Using Photoproduction at CLAS", Phys. Rev. C 103, 025206 (2021).
28. M. Mirazita et al. (CLAS Collaboration), "Beam-Spin Asymmetry in Semi-Inclusive Electroproduction of Hadron Pairs", Phys. Rev. Lett. 126, 062002 (2021).
29. Y.G. Sharabian et al., "The CLAS12 High Threshold Cherenkov Counter", Nucl. Inst. and Meth. A 968, 163824 (2020).
30. V.I. Mokeev et al. (CLAS Collaboration), "Evidence for the  $N(1720)3/2^+$  nucleon resonance from combined studies of CLAS  $\pi^+ \pi^- p$  photo- and electroproduction data," Phys. Lett. B 805, 135457 (2020).
31. Y.G. Sharabian et al., "The CLAS12 high threshold Cherenkov counter," Nucl. Instrum. Meth. A 968 163824 (2020).
32. M. Contalbrigo et al., "The CLAS12 Ring Imaging Cherenkov Detector", Nucl. Inst. and Meth. A 964, 163791 (2020).
33. V.D. Burkert et al. (CLAS Collaboration), "The CLAS12 Spectrometer at Jefferson Laboratory", Nucl. Inst. and Meth. A 959, 163419 (2020).

34. D.S. Carman, K. Joo, and V.I. Mokeev, "Strong QCD Insight from Excited Nucleon Structure Studies with CLAS and CLAS12," *Few-Body Systems* 61,29 (2020).
35. T. Hu et al. (*CLAS Collaboration*), "Photoproduction of  $\eta$  Mesons off the Proton for  $1.2 < E_\gamma < 4.7$  GeV Using CLAS at Jefferson Laboratory", *Phys. Rev. C* 102, 065203 (2020).
36. S. Diehl et al. (*CLAS Collaboration*), "Extraction of Beam Asymmetries from the Hard  $\pi^+$  Channel off the Unpolarized Hydrogen Target in a Wide Range of Kinematics," *Phys. Rev. Lett.* 125, 182001 (2020).
37. A. Celentano et al. (*CLAS Collaboration*), "First Measurement of Direct Photoproduction of the  $a_2(1320)^0$  Meson on the Proton", *Phys. Rev. C* 102, 032201(R) (2020).
38. A. Schmidt et al. (*CLAS Collaboration*), "Probing the Core of the Strong Nuclear Interaction", *Nature* 578, 540 (2020).
39. N. Zachariou et al. (*CLAS Collaboration*), "Beam-Target Helicity Asymmetry E in  $K^+\Sigma^+$  Photoproduction on the Neutron," *Phys. Lett. B* 808 (2020).
40. N. Markov et al. (*CLAS Collaboration*), "Exclusive  $\pi^0 p$  Electroproduction off Protons in the Resonance Region at Photon Virtualities  $0.4 < Q^2 < 1$  GeV<sup>2</sup>," *Phys. Rev. C* 101, 015208 (2020).
41. M. Duer et al. (*CLAS Collaboration*), "Measurement of Nuclear Transparency Ratios for Protons and Neutrons," arXiv:1811.01823, accepted for publication in *Phys. Rev. Lett.* (2019).
42. M. Hattawy et al. (*CLAS Collaboration*), "Exploring the Structure of the Bound Proton with Deeply Virtual Compton Scattering," *Phys. Rev. Lett.* 123, 032502 (2019).
43. M. Duer et al. (*CLAS Collaboration*), "Direct Observation of Proton-Neutron Short-Range Correlation Dominance in Heavy Nuclei," *Phys. Rev. Lett.* 122, 172502 (2019).
44. P. Roy et al. (*CLAS Collaboration*), "First Measurements of the Double-Polarization Observables F, P, and H in  $\omega$  Photoproduction off Transversely-Polarized Protons in the  $N^*$  Resonance Region," *Phys. Rev. Lett.* 122, 162301 (2019).
45. Schmookler et al. (*CLAS Collaboration*), "Modified Structure of Protons and Neutrons in 2 Correlated Pairs," *Nature* 566, 354 (2019).
46. Zhao et al. (*CLAS Collaboration*), "Measurement of the Beam Spin Asymmetry of  $ep \rightarrow e'p'\eta$  in the Deep-Inelastic Regime with CLAS," *Phys. Lett. B.* 789, 426 (2019).
47. Golovatch et al. (*CLAS Collaboration*), "First Results on Nucleon Resonance Photocouplings from  $\gamma^* p \rightarrow \pi^+\pi^-p$  Cross Sections," *Phys. Lett. B* 788, 371 (2019).
48. J. Goetz et al. (*CLAS Collaboration*), "Study of  $\Xi^*$  Photoproduction from Threshold to  $W=3.3$  GeV," *Phys. Rev.* 98, 062201(R) (2018).
49. D.H. Ho et al. (*CLAS Collaboration*), "Beam-Target Helicity Asymmetry E in  $K^0\Lambda$  and  $K^0\Sigma^0$  Photoproduction on the Neutron," *Phys. Rev. C* 98, 045205 (2018).
50. N. Saylor et al. (*CLAS Collaboration*), "Measurement of Unpolarized and Polarized Cross Sections for Deeply Virtual Compton on the Proton at Jefferson Laboratory with CLAS," *Phys. Rev. C* 98, 045203 (2018).
51. S. Lombardo et al. (*CLAS Collaboration*), "Photoproduction of  $K^+K^-$  Meson Pairs on the Proton," *Phys. Rev. D* 98, 052009 (2018).
52. Cohen et al. (*CLAS Collaboration*), "The Center of Mass Motion of Short-Range Correlated Nucleon Pairs Studies via the  $A(e,e'pp)$  Reaction," *Phys. Rev. Lett.* 121, 095201 (2018).

53. Fedotov *et al.* (CLAS Collaboration), "Measurements of  $\gamma^* p \rightarrow p' \pi^+ \pi^-$  Cross Section with the CLAS Detector for  $0.4 \text{ GeV}^2 < Q^2 < 1.0 \text{ GeV}^2$  and  $1.3 \text{ GeV} < W < 1.825 \text{ GeV}$ ," Phys. Rev. C 98, 025203 (2018).
54. J. Bono *et al.* (CLAS Collaboration), "First Measurement of  $\Xi^-$  Polarization in Photoproduction," Phys. Lett. B 783, 280 (2018).
55. M. Kunkel *et al.* (CLAS Collaboration), "Exclusive Photoproduction of  $\pi^0$  up to Large Values of Mandelstam Variables  $s, t$ , and  $u$  with CLAS," Phys. Rev. C 98, 015207 (2018).
56. S. Jawalkar *et al.* (CLAS Collaboration), "Semi-Inclusive  $\pi^0$  Target and Beam-Target Asymmetries from 6 GeV Electron Scattering with CLAS," Phys. Lett. B 782, 662 (2018).
57. T. Chetry *et al.* (CLAS Collaboration), "Differential Cross Section for  $\gamma d \rightarrow \omega d$  Using CLAS at Jefferson Lab," Phys. Lett. B 782, 646 (2018).
58. M. Duer *et al.* (CLAS Collaboration), "Probing High Momentum Protons and Neutrons in Asymmetric Nuclei," Nature 560, 617 (2018).
59. P. Roy *et al.* (CLAS Collaboration), "Measurement of the Beam Asymmetry  $\Sigma$  and the Target Asymmetry  $T$  in the Photoproduction of  $\omega$  Mesons off the Proton using CLAS at Jefferson Laboratory," Phys. Rev. C 97, 055202 (2018).
60. K. Park *et al.* (CLAS Collaboration), "Hard Exclusive Pion Electroproduction at Backward," Phys. Lett. B 780, 340-345 (2018).
61. S. Chandvar *et al.* (CLAS Collaboration), "Double Photoproduction off the Proton at CLAS," Phys. Rev. C 97, 025203 (2018).
62. K. P. Adhikari *et al.* (CLAS Collaboration), "Measurement of the  $Q^2$  Dependence of the Deuteron Spin Structure Function  $g_1$  and its Moments at  $0.02 < Q^2 < 0.7 \text{ GeV}^2$  with CLAS," Phys. Rev. Lett. 120, 062501 (2018).
63. Z. Akbar *et al.* (CLAS Collaboration), "Measurement of the Helicity Difference  $E$  in  $\omega \rightarrow \pi^+ \pi^- \pi^0$  Photoproduction," Phys. Rev. C 96, 065209 (2017).
64. R.G. Fersch *et al.* (CLAS Collaboration), "Determination of the Proton Spin Structure Functions for  $0.05 < Q^2 < 5 \text{ GeV}^2$  Using CLAS," Phys. Rev. C 96, 065208 (2017).
65. N. Compton *et al.* (CLAS Collaboration), "Measurement of the Differential and Total Cross Sections of the  $\gamma d \rightarrow K^0 \Lambda$  Reaction within the Resonance Region," Phys. Rev. C 96, 065201 (2017).
66. M. Hattawy *et al.* (CLAS Collaboration), "First Exclusive Measurement of Deeply Virtual Compton Scattering off  $^4\text{He}$ : Toward the 3D Tomography of Nuclei," Phys. Rev. Lett. 119, 202004 (2017).
67. P.T. Mattione *et al.* (CLAS Collaboration), "Differential Cross Section Measurements for  $\gamma n \rightarrow \pi^- p$  Above the First Nucleon Resonance Region," Phys. Rev. C 96, 035204 (2017).
68. E.L. Isupov *et al.* (CLAS Collaboration), "Measurements of  $ep \rightarrow e' \pi^+ \pi^- p$  Cross Sections with CLAS at  $1.40 \text{ GeV} < W < 2.0 \text{ GeV}$  and  $2.0 \text{ GeV}^2 < Q^2 < 5.0 \text{ GeV}^2$ ," Phys. Rev. C 96, 025209 (2017).
69. P. Collins *et al.* (CLAS Collaboration), "Photon Beam Asymmetry  $\Sigma$  in the Reaction  $\gamma p \rightarrow p \omega$  for  $E_\gamma = 1.152$  to  $1.876 \text{ GeV}$ ," Phys. Lett. B 773, 112 (2017).
70. Ho *et al.* (CLAS Collaboration), "Beam-Target  $E$  Asymmetry for  $\gamma n \rightarrow \pi^- p$  in the  $N^*$  Resonance Region," Phys. Rev. Lett. 118, 242002 (2017).



71. P. Collins *et al.* (*CLAS Collaboration*), "Photon Beam Asymmetry  $\Sigma$  for  $\eta$  and  $\eta'$  Photoproduction from the Proton," *Phys. Lett. B* 771, 213 (2017).
72. A.V. Anisovich *et al.* (*CLAS Collaboration*), "Differential Cross Sections and Polarization Observables from CLAS  $K^*$  Photoproduction and the Search for New  $N^*$  States," *Phys. Lett. B* 771, 142 (2017).
73. Rimal *et al.* (*CLAS Collaboration*), "Measurement of Two-Photon Exchange Effect by Comparing Elastic  $e^{+/-}$  p Cross Sections," *Phys. Rev. C* 95, 065201 (2017).
74. P. Bosted *et al.* (*CLAS Collaboration*), "Target and Beam-Target Spin Asymmetries in Exclusive  $\pi^0$  Electroproduction for  $Q^2 > 1 \text{ GeV}^2$   $ep \rightarrow e'\pi^0p$ ," *Phys. Rev. C* 95, 035207 (2017).
75. P. Bosted *et al.* (*CLAS Collaboration*), "Target and Beam-Target Spin Asymmetries in Exclusive  $\pi^+$  Electroproduction for  $Q^2 > 1 \text{ GeV}^2$   $ep \rightarrow e'\pi^+n$ ," *Phys. Rev. C* 95, 035206 (2017).
76. Bedlinskiy *et al.* (*CLAS Collaboration*), "Exclusive  $\eta$  Electroproduction at  $W > 2 \text{ GeV}$  with CLAS and Transversity GPDs," *Phys. Rev. C* 95, 035202 (2017).
77. M. Mayer *et al.* (*CLAS Collaboration*), "Beam-Target Double Spin Asymmetry in Quasi-Elastic Electron Scattering off the Deuteron with CLAS," *Phys. Rev. C* 95, 024005 (2017).
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