

Shohini Bhattacharya

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Education and Professional Appointments

- 01/2025 – Present  **Assistant Professor of Physics, University of Connecticut**
- 02/2024 – 12/2024  **J. Robert Oppenheimer Fellow, Los Alamos National Laboratory**
- 10/2021 – 02/2024  **Postdoctoral Research Associate, Brookhaven National Laboratory (BNL) and RIKEN BNL Research Center**
- 08/2021 – 10/2021  **Adjunct Research Assistant Professor, Temple University**
- 08/2015 – 08/2021  **Ph.D., Temple University, Theoretical Nuclear Physics**
Thesis: *A comprehensive study of the proton structure: From PDFs to Wigner Functions*
- 2014 – 2015  **Visiting Scholar, Vivekananda University**
- 2012 – 2014  **M.Sc. Physics, Indian Institute of Technology (IIT) Delhi**
- 2009 – 2012  **B.Sc. Physics, University of Calcutta**

Research Focus and Proficiencies

- Research Focus  Quantum Chromodynamics (QCD); Electron-Ion Collider physics; Hadron spin & mass structure; Perturbative QCD; QCD factorization; Higher twist effects; Phenomenology of lepton- and hadron-induced scattering processes; Multi-dimensional imaging of hadrons; Developing formalisms to calculate various non-perturbative quantities in Lattice QCD and establish connections to phenomenology; Investigating anomalies in field theories; Global analysis of data; Testing of Standard Model and fundamental symmetries
- Proficiencies  Python (Pandas, Matplotlib, Jupyter, Numpy, Scipy, data analysis/visualization), Mathematica, \LaTeX , Microsoft Office, Operating Systems: Linux (Ubuntu), Windows

Awards and Accolades

- 2024  Recipient of the prestigious **Oppenheimer Distinguished Postdoctoral Fellowship**, a 3-year award granted by Los Alamos National Laboratory
- 2022  Awarded the **Gary McCartor Fellowship Award** by the International Light Cone Advisory Committee, Inc. (ILCAC)
- 2021  Awarded **Doctoral Dissertation Completion Grant** for the Summer 2021 term by the Graduate Board Fellowship Committee of Temple University
- 2020  Recipient of the 2020 **Outstanding Research by a Graduate Student** in the College of Science and Technology, Temple University
- 2019-2020  Recipient of the 2019/2020 **Peter Havas Humanitarian Scholarship for Outstanding Graduate Students** from the Physics Department, Temple University
- 2018  Awarded **First Best student's talk** at the 33rd annual Hampton University Graduate Studies (HUGS 2018) Program held at Jefferson Lab for the talk titled as "*Accessing parton Orbital Angular Momentum through Generalized TMDs*"
 Received **HUGS fellowship** for the 33rd annual HUGS 2018 Program held at Jefferson Lab
- 2017  Recipient of the 2017 **Outstanding Teaching by a Graduate Student** in the College of Science and Technology, Temple University

Awards and Accolades (continued)

- 2012  Secured an **All India Rank of 74 (among 50,000+ contenders)** in Joint Admission test for M.Sc. (Indian Institute of Technology/IIT JAM-2012), a national-level examination for admission to master's degree program in Physics at IITs

Research Publications

I have authored **22 original papers** published in peer-reviewed scientific journals, such as Physical Review Letters, Physical Review D, and Physics Letters B. Furthermore, I have played an active role in shaping **3 community white papers**, and my research has been showcased in **24 publications featured in the proceedings of prominent conferences, 8 of which underwent peer review**. A comprehensive list of my publications is provided below.

Journal Articles

- 1 Bhattacharya, S., Boussarie, R., & Hatta, Y. (2024a, April). *Exploring orbital angular momentum and spin-orbit correlation for gluons at the Electron-Ion Collider*. (Submitted for publication). arXiv: [2404.04209](https://arxiv.org/abs/2404.04209) [hep-ph]
- 2 Bhattacharya, S., Boussarie, R., & Hatta, Y. (2024b, April). *Spin-orbit entanglement in the Color Glass Condensate*. (Submitted for publication). arXiv: [2404.04208](https://arxiv.org/abs/2404.04208) [hep-ph]
- 3 Bhattacharya, S. et al. (2024). *Generalized parton distributions from lattice QCD with asymmetric momentum transfer: Axial-vector case*. [doi:10.1103/PhysRevD.109.034508](https://doi.org/10.1103/PhysRevD.109.034508). arXiv: [2310.13114](https://arxiv.org/abs/2310.13114) [hep-lat]
- 4 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Nurminen, N., & Steffens, F. (2024). *Generalized parton distributions from the pseudodistribution approach on the lattice*. [doi:10.1103/PhysRevD.110.054502](https://doi.org/10.1103/PhysRevD.110.054502). arXiv: [2405.04414](https://arxiv.org/abs/2405.04414) [hep-lat]
- 5 Bhattacharya, S., Zheng, D., & Zhou, J. (2024a). *Accessing the gluon GTMD $F_{1,4}$ in exclusive π^0 production in ep collisions*. [doi:10.1103/PhysRevD.109.096029](https://doi.org/10.1103/PhysRevD.109.096029). arXiv: [2304.05784](https://arxiv.org/abs/2304.05784) [hep-ph]
- 6 Bhattacharya, S., Zheng, D., & Zhou, J. (2024b). *Probing the Quark Orbital Angular Momentum at Electron-Ion Colliders Using Exclusive π^0 Production*. [doi:10.1103/PhysRevLett.133.051901](https://doi.org/10.1103/PhysRevLett.133.051901). arXiv: [2312.01309](https://arxiv.org/abs/2312.01309) [hep-ph]
- 7 Bhattacharya, S., Cichy, K., Constantinou, M., Dodson, J., Metz, A., Scapellato, A., & Steffens, F. (2023). *Chiral-even axial twist-3 GPDs of the proton from lattice QCD*. [doi:10.1103/PhysRevD.108.054501](https://doi.org/10.1103/PhysRevD.108.054501). arXiv: [2306.05533](https://arxiv.org/abs/2306.05533) [hep-lat]
- 8 Bhattacharya, S., Cichy, K., Constantinou, M., Gao, X., Metz, A., Miller, J., ... Zhao, Y. (2023). *Moments of proton GPDs from the OPE of nonlocal quark bilinears up to NNLO*. [doi:10.1103/PhysRevD.108.014507](https://doi.org/10.1103/PhysRevD.108.014507). arXiv: [2305.11117](https://arxiv.org/abs/2305.11117) [hep-lat]
- 9 Bhattacharya, S., Hatta, Y., & Vogelsang, W. (2023b). *Chiral and trace anomalies in deeply virtual Compton scattering*. [doi:10.1103/PhysRevD.107.014026](https://doi.org/10.1103/PhysRevD.107.014026). arXiv: [2210.13419](https://arxiv.org/abs/2210.13419) [hep-ph]
- 10 Bhattacharya, S., Hatta, Y., & Vogelsang, W. (2023c). *Chiral and trace anomalies in deeply virtual Compton scattering. II. QCD factorization and beyond*. [doi:10.1103/PhysRevD.108.014029](https://doi.org/10.1103/PhysRevD.108.014029). arXiv: [2305.09431](https://arxiv.org/abs/2305.09431) [hep-ph]
- 11 Bhattacharya, S., Boussarie, R., & Hatta, Y. (2022). *Signature of the Gluon Orbital Angular Momentum*. (**DOE Highlight**). [doi:10.1103/PhysRevLett.128.182002](https://doi.org/10.1103/PhysRevLett.128.182002). arXiv: [2201.08709](https://arxiv.org/abs/2201.08709) [hep-ph]
- 12 Bhattacharya, S., Cichy, K., Constantinou, M., Dodson, J., Gao, X., Metz, A., ... Zhao, Y. (2022). *Generalized parton distributions from lattice QCD with asymmetric momentum transfer: Unpolarized quarks*. (**DOE Highlight**). [doi:10.1103/PhysRevD.106.114512](https://doi.org/10.1103/PhysRevD.106.114512). arXiv: [2209.05373](https://arxiv.org/abs/2209.05373) [hep-lat]

- 13 Bhattacharya, S., Kang, Z.-B., Metz, A., Penn, G., & Pitonyak, D. (2022b). *First global QCD analysis of the TMD g_{1T} from semi-inclusive DIS data*. [doi:10.1103/PhysRevD.105.034007](https://doi.org/10.1103/PhysRevD.105.034007). arXiv: 2110.10253 [hep-ph]
- 14 Bhattacharya, S., & Metz, A. (2022). *Burkhardt-Cottingham-type sum rules for light-cone and quasi-PDFs*. [doi:10.1103/PhysRevD.105.054027](https://doi.org/10.1103/PhysRevD.105.054027). arXiv: 2105.07282 [hep-ph]
- 15 Bhattacharya, S., Metz, A., Ojha, V. K., Tsai, J.-Y., & Zhou, J. (2022). *Exclusive double quarkonium production and generalized TMDs of gluons*. [doi:10.1016/j.physletb.2022.137383](https://doi.org/10.1016/j.physletb.2022.137383). arXiv: 1802.10550 [hep-ph]
- 16 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2021). *Parton distribution functions beyond leading twist from lattice QCD: The $h_L(x)$ case*. [doi:10.1103/PhysRevD.104.114510](https://doi.org/10.1103/PhysRevD.104.114510). arXiv: 2107.02574 [hep-lat]
- 17 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2020a). *Insights on proton structure from lattice QCD: The twist-3 parton distribution function $g_T(x)$* . (**Editor's Suggestion**). [doi:10.1103/PhysRevD.102.111501](https://doi.org/10.1103/PhysRevD.102.111501). arXiv: 2004.04130 [hep-lat]
- 18 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2020b). *One-loop matching for the twist-3 parton distribution $g_T(x)$* . [doi:10.1103/PhysRevD.102.034005](https://doi.org/10.1103/PhysRevD.102.034005). arXiv: 2005.10939 [hep-ph]
- 19 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2020c). *The role of zero-mode contributions in the matching for the twist-3 PDFs $e(x)$ and $h_L(x)$* . [doi:10.1103/PhysRevD.102.114025](https://doi.org/10.1103/PhysRevD.102.114025). arXiv: 2006.12347 [hep-ph]
- 20 Bhattacharya, S., Cocuzza, C., & Metz, A. (2020b). *Exploring twist-2 GPDs through quasidistributions in a diquark spectator model*. [doi:10.1103/PhysRevD.102.054021](https://doi.org/10.1103/PhysRevD.102.054021). arXiv: 1903.05721 [hep-ph]
- 21 Bhattacharya, S., Cocuzza, C., & Metz, A. (2019a). *Generalized quasi parton distributions in a diquark spectator model*. [doi:10.1016/j.physletb.2018.09.061](https://doi.org/10.1016/j.physletb.2018.09.061). arXiv: 1808.01437 [hep-ph]
- 22 Bhattacharya, S., Metz, A., & Zhou, J. (2017a). *Generalized TMDs and the exclusive double Drell-Yan process*. [Erratum: Phys.Lett.B 810, 135866 (2020)]. [doi:10.1016/j.physletb.2017.05.081](https://doi.org/10.1016/j.physletb.2017.05.081). arXiv: 1702.04387 [hep-ph]

Community White papers

- 1 Boer, D. et al. (2024, September). *Physics case for quarkonium studies at the Electron Ion Collider*. **Note:** In this article, I contributed by authoring a section that provides a comprehensive review of the current state of observables sensitive to Wigner functions. Additionally, I explored potential avenues and prospects for accessing these functions through quarkonia-pair production at the Electron-Ion Collider. arXiv: 2409.03691 [hep-ph]
- 2 Chapon, E. et al. (2022). *Prospects for quarkonium studies at the high-luminosity LHC*. **Note:** In this article, I made a contribution by authoring a section that extensively reviewed the current state of observables sensitive to Wigner functions. Furthermore, I discussed the potential avenues and prospects for accessing these functions through quarkonia-pair production at the high-luminosity LHC. [doi:10.1016/j.pnnp.2021.103906](https://doi.org/10.1016/j.pnnp.2021.103906). arXiv: 2012.14161 [hep-ph]
- 3 Abdul Khalek, R. et al. (2021, March). *Science Requirements and Detector Concepts for the Electron-Ion Collider: EIC Yellow Report*. **Note:** In this article, my substantial contributions encompassed editing the section on Wigner functions and compiling comprehensive tables that sought to elucidate the connections between Electron-Ion collider science and various categories of measurements. Furthermore, I took on the task of standardizing all mathematical notations throughout the document to ensure consistency with those used in the White Paper and the NAS Report. arXiv: 2103.05419 [physics.ins-det]

Peer-reviewed Conference Proceedings

- 1 Bhattacharya, S., Kang, Z.-B., Metz, A., Penn, G., & Pitonyak, D. (n.d.). First global extraction of the worm-gear tmd. In *Proceedings of the 24th international spin symposium (spin2021)*.
doi:10.7566/JSPSCP.37.020125. eprint:
<https://journals.jps.jp/doi/pdf/10.7566/JSPSCP.37.020125>
- 2 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2022a). Relating Euclidean correlators and light-cone correlators beyond leading twist. (Vol. LATTICE2021, p. 105).
doi:10.22323/1.396.0105
- 3 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2022b). Twist-3 partonic distributions from lattice QCD. (Vol. 8, p. 057). doi:10.21468/SciPostPhysProc.8.057. arXiv: 2107.12818 [hep-lat]
- 4 Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2022c). Zero modes and matching for the twist-3 PDFs. (p. 56). doi:10.21468/SciPostPhysProc.8.056
- 5 Bhattacharya, S., Kang, Z.-B., Metz, A., Penn, G., & Pitonyak, D. (2022a). Extraction of the worm-gear TMD g_{1T} from COMPASS, HERMES and JLab data on semi-inclusive DIS. (Vol. PANIC2021, p. 361).
doi:10.22323/1.380.0361
- 6 Constantinou, M., Bhattacharya, S., Cichy, K., Metz, A., Scapellato, A., & Steffens, F. (2022). First study of twist-3 PDFs for the proton from lattice QCD. (Vol. LATTICE2021, p. 391).
doi:10.22323/1.396.0391. arXiv: 2111.01056 [hep-lat]
- 7 Bhattacharya, S., Cocuzza, C., & Metz, A. (2020a). What can we learn about twist-2 GPDs through quasi-distributions? (Vol. 1643, p. 012183). doi:10.1088/1742-6596/1643/1/012183
- 8 Bhattacharya, S., Metz, A., Ojha, V. K., Tsai, J.-Y., & Zhou, J. (2018). Accessing generalized TMDs through double Drell-Yan and double η_Q production processes. (Vol. DIS2018, p. 149).
doi:10.22323/1.316.0149

Not peer-reviewed Conference Proceedings

- 1 Miller, J., Bhattacharya, S., Cichy, K., Constantinou, M., Gao, X., Metz, A., ... Zhao, Y. (2024, March). Proton Helicity GPDs from Lattice QCD. arXiv: 2403.05282 [hep-lat]
- 2 Constantinou, M., Bhattacharya, S., Cichy, K., Dodson, J., Metz, A., Steffens, F., & Scapellato, A. (2024). Twist-3 axial GPDs of the proton from lattice QCD, *LATTICE2023*, 315. doi:10.22323/1.453.0315
- 3 Nurminen, N., Bhattacharya, S., Chomicki, W., Cichy, K., Constantinou, M., Metz, A., & Steffens, F. (2024). Unveiling Generalized Parton Distributions through the Pseudo-Distribution Approach, *LATTICE2023*, 318. doi:10.22323/1.453.0318. arXiv: 2311.18502 [hep-lat]
- 4 Bhattacharya, S., Hatta, Y., & Vogelsang, W. (2023a, August). Unraveling anomalies in Deeply Virtual Compton Scattering. *30th International Workshop on Deep-Inelastic Scattering and Related Subjects*. arXiv: 2308.15377 [hep-ph]
- 5 Bhattacharya, S., Boussarie, R., & Hatta, Y. (2023). Probing the Gluon Orbital Angular Momentum at the EIC, *16.7, 7–A16*. doi:10.5506/APhysPoLBSupp.16.7–A16
- 6 Bhattacharya, S., Cichy, K., Constantinou, M., Dodson, J., Gao, X., Metz, A., ... Zhao, Y. (2023). GPDs in asymmetric frames. *Proceedings of the 39th international symposium on lattice field theory — pos(lattice2022)*, 430, 095. doi:10.22323/1.430.0095
- 7 Cichy, K. et al. (2023). Generalized Parton Distributions from Lattice QCD, *16.7, 7–A6*. doi:10.5506/APhysPoLBSupp.16.7–A6. arXiv: 2304.14970 [hep-lat]

- 8 Constantinou, M., Bhattacharya, S., Cichy, K., Dodson, J., Gao, X., Metz, A., ... Zhao, Y. (2023). Accessing proton GPDs in asymmetric frames: Numerical implementation. *Proceedings of the 39th international symposium on lattice field theory — pos(lattice2022)*, 430, 096. [doi:10.22323/1.430.0096](https://doi.org/10.22323/1.430.0096)
- 9 Bhattacharya, S. (2022, September). Observable for gluon orbital angular momentum. [doi:10.5281/zenodo.7103955](https://doi.org/10.5281/zenodo.7103955)
- 10 Dodson, J., Bhattacharya, S., Cichy, K., Constantinou, M., Metz, A., Scapellato, A., & Steffens, F. (2022). First Lattice QCD Study of Proton Twist-3 GPDs, *LATTICE2021*, 054. [doi:10.22323/1.396.0054](https://doi.org/10.22323/1.396.0054). arXiv: 2112.05538 [hep-lat]
- 11 Hatta, Y. et al. (2020, February). Proceedings, Probing Nucleons and Nuclei in High Energy Collisions: Dedicated to the Physics of the Electron Ion Collider: Seattle (WA), United States, October 1 - November 16, 2018. [doi:10.1142/11684](https://doi.org/10.1142/11684). arXiv: 2002.12333 [hep-ph]
- 12 Bhattacharya, S., Cocuzza, C., & Metz, A. (2020c). Model Calculations of Euclidean Correlators. *Probing Nucleons and Nuclei in High Energy Collisions: Dedicated to the Physics of the Electron Ion Collider*, 55–58. [doi:10.1142/9789811214950_0011](https://doi.org/10.1142/9789811214950_0011)
- 13 Bhattacharya, S., Cocuzza, C., & Metz, A. (2019b). Going off the light-cone - a model study of quasi-GPDs, *LC2019*, 027. [doi:10.22323/1.374.0027](https://doi.org/10.22323/1.374.0027)
- 14 Bhattacharya, S., Cocuzza, C., & Metz, A. (2019c). Studying twist-2 GPDs through quasi-distributions in a scalar diquark model, *DIS2019*, 169. [doi:10.22323/1.352.0169](https://doi.org/10.22323/1.352.0169)
- 15 Bhattacharya, S., Metz, A., & Zhou, J. (2018). Generalized TMDs in the exclusive double Drell-Yan process, *DIS2017*, 238. [doi:10.22323/1.297.0238](https://doi.org/10.22323/1.297.0238)
- 16 Bhattacharya, S., Metz, A., & Zhou, J. (2017b). Observables for Generalized TMDs of Quarks, *QCDEV2017*, 006. [doi:10.22323/1.308.0006](https://doi.org/10.22323/1.308.0006)

Talks

I have disseminated my research findings through a total of **78 talks and seminars**. Among them, **57 were invitations** to speak at conferences, workshops, national laboratories, and universities, both within and outside the United States. An additional **21 were valuable contributed talks** that I presented at both national and international conferences.

Invited Talks/Seminars

- 2025 📌 TBD (talk) - 11th International Conference on Physics Opportunities at an Electron-Ion Collider (POETIC XI)
February 24-28, 2025 - Florida International University, Miami, USA
- 2024 📌 EIC Theory Overview (**Plenary Talk**) - Uncovering New Laws of Nature at the EIC
November 20, 2024 - Brookhaven National Laboratory, Upton, USA
- 📌 TBD (seminar) - T-2 seminar
November 14, 2024 - Los Alamos National Laboratory, USA
- 📌 TBD (seminar) - Theory seminar
October 28 - October 30, 2024 - Ecole Polytechnique, France
- 📌 TBD (talk) - Multidimensional Hadron Structure (MDHS) workshop
October 21 - October 25, 2024 - Institut Pascal of the Universite Paris-Saclay, France
- 📌 TBD (seminar) - Graduate student seminar series
October 18, 2024 - Storrs, Connecticut
- 📌 Quantum Anomalies in (Generalized) Parton Distributions (seminar) - Pizza Lunch Seminar
September 18, 2024 - University of California, Los Angeles, USA

Talks (continued)

- Lattice calculations of GPDs and higher-twist PDFs (talk) - Heavy Ion Physics in the EIC Era (INT-24-2b)
August 12, 2024 - Seattle, Washington, USA
- Probing quark and gluon orbital angular momentum (talk) - Towards improved hadron tomography with hard exclusive reactions
August 5, 2024 - ECT*, Trento, Italy
- Hadron structure via GPDs (**Plenary Talk**) - The 41st Lattice Conference
August 2, 2024 - Liverpool, UK
- Recent advances in GPD calculations from Lattice QCD (**Plenary Talk**) - 10th International Conference on Quarks and Nuclear Physics (QNP2024)
July 11, 2024 - Institute of Cosmos Sciences of the University of Barcelona, Spain
- Observables for Generalized TMDs (talk) - Transversity 2024 Workshop
June 5, 2024 - Trieste, Italy
- State-of-the-art of observables for Generalized TMDs (talk) - QCD Evolution workshop
May 30, 2024 - University of Pavia, Pavia, Italy
- Unraveling quantum anomalies in Generalized Parton Distributions (seminar) - Physics Division Seminar
April 15, 2024 - Argonne National Laboratory, Lemont, USA
- Unveiling the "cosmic" interior of nucleons at the Electron-Ion Collider (colloquium) - Nuclear Theory talk
April 4, 2024 - New Mexico State University, New Mexico, USA
- A comprehensive insight into nucleons at the Electron-Ion Collider (seminar) - Nuclear Physics Seminar
March 26, 2024 - University of Connecticut, Storrs, USA
- Unveiling the "cosmic" interior of nucleons at the Electron-Ion Collider (colloquium) - Nuclear Theory talk
February 20, 2024 - Florida International University, Miami, USA
- A comprehensive insight into nucleons at the Electron-Ion Collider (seminar) - CFNS Seminar
February 7, 2024 - CFNS, Stony Brook University, USA
- A comprehensive insight into nucleons at the Electron-Ion Collider (seminar) - Nuclear Theory Seminar
February 2, 2024 - Temple University, Philadelphia, USA
- 2023 ■ Uncovering anomalies in Generalized Parton Distributions (seminar) - Nuclear Theory Seminar
November 9, 2023 - University of Maryland, College Park, Maryland, USA
- Axial and trace anomalies in DVCS (talk) - EINN2023
November 1, 2023 - Athens, Greece, Europe
- Generalized TMDs and GPDs: Recent Advances (seminar) - Hadron Ion Tea (HIT) Seminar Series
October 31, 2023 - Lawrence Berkeley National Laboratory, California, USA
- Generalized Parton Distributions from Lattice QCD (talk) - 1st CFNS Postdoc Meet
October 19, 2023 - CFNS, Stony Brook University, USA
- What are GPDs and how to access them on Lattice QCD? (**Plenary Talk**) - SPIN 2023
September 29, 2023 - Duke University, North Carolina, USA
- Imprints of Chiral and Trace Anomalies in GPDs (talk) - Workshop: Precision QCD predictions for ep Physics at the EIC (11)
September 20, 2023 - CFNS, Stony Brook University, USA

Talks (continued)

- Chiral and trace anomalies in Generalized Parton Distributions (seminar) - High Energy Theory Seminars
September 15, 2023 - Brookhaven National Laboratory, Upton, USA
- Quark GPDs from non-symmetric frames (talk) - Lattice QCD and Probes of New Physics
August 8, 2023 - Santa Fe, New Mexico, USA
- Calculating GPDs in Lattice QCD: Recent developments (talk) - International Workshop on Hadron Structure and Spectroscopy - 2023 (IWHSS-2023)
June 27, 2023 - Prague, Czechia
- Anomalies in Deep Virtual Compton Scattering (talk) - 10th International Conference on Physics Opportunities at an Electron-Ion Collider (POETIC 2023)
May 5, 2023 - São Paulo, Brazil
- Manifestation of anomalies in Deep Virtual Compton Scattering (seminar) - Jefferson Lab Theory Seminars
April 10, 2023 - Jefferson Lab, Virginia, USA
- Chiral and trace anomalies in DVCS (talk) - CFNS Monthly Postdoc Meetings
March 10, 2023 - CFNS, Stony Brook University, USA
- Computing PDFs and GPDs in Lattice QCD: Recent Progress (seminar) - Center for Nuclear Theory seminar
February 22, 2023 - Stony Brook University, USA
- Primary observables to access orbital angular momentum of partons (seminar) - Nuclear Physics Seminar
February 13, 2023 - University of Illinois Urbana-Champaign, Illinois, USA
- Hunting for gluon orbital angular momentum at the EIC (talk) - XXIX Cracow Epiphany Conference on Physics at the EIC and Future Facilities
January 18, 2023 - Cracow, Poland
- 2022 ■ Probing gluon orbital angular momentum through exclusive dijet production at the EIC (talk) - QCD with Electron Ion Collider workshop (QEIC 11)
December 19, 2022 - IIT Delhi, New Delhi, India
- A full tomographic picture of hadronic matter at the Electron-Ion Collider (seminar) - Rising Researchers Seminar Series
December 6, 2022 - Institute of Nuclear Physics/University of Washington, USA
- Generalized TMDs and parton Orbital Angular Momentum (seminar) - UCLA Nuclear Theory Group Seminar
November 14, 2022 - ZOOM
- GTMDs and GPDs: Perspectives from experiments and lattice QCD (seminar) - T-2 Seminar
September 27, 2022 - Los Alamos National Laboratory, USA
- Signature(s) of gluon orbital angular momentum (talk @ McCartor Award Session) - Light Cone 2022: Physics of Hadrons on the Light Front
September 21, 2022 - ZOOM
- Lattice calculations of GPDs (talk) - INT 22-83 Workshop on Parton distributions and nucleon structure
September 16, 2022 - Seattle, Washington, USA
- A novel approach to calculate GPDs from lattice QCD from non-symmetric frames (talk) - QNP2022 - The 9th International Conference on Quarks and Nuclear Physics
September 5, 2022 - ZOOM (Florida State University)
- GTMDs and Wigner functions (talk) - International Workshop on Hadron Structure and Spectroscopy - 2022 (IWHSS-2022)
August 30, 2022 - CERN, Geneva, Switzerland

Talks (continued)

- Global fit for g_{1T} TMD (talk) - Workshop: Precision QCD predictions for ep Physics at the EIC
August 3, 2022 - CFNS, Stony Brook University, USA
- Exploring twist-3 PDFs and GPDs from lattice QCD (talk) - Towards improved hadron femtography with hard exclusive reactions
July 21, 2022 - Virginia Tech, Virginia, USA
- Twist-3 PDFs from lattice QCD with a phenomenological component (talk) - CFNS Workshop: High Luminosity-EIC (EIC-Phase II)
June 23, 2022 - CFNS, Stony Brook University, USA
- Global analysis of worm-gear function g_{1T} (talk) - TMD Collaboration Meeting
June 15, 2022 - ZOOM
- DSA as a simultaneous probe for gluon OAM and its helicity (talk) - EIC Jets meeting
June 6, 2022 - CFNS, Stony Brook University, USA
- GTMDs and Wigner distributions: Recent developments (talk) - Transversity 2022 Workshop
May 25, 2022 - Pavia, Italy
- A novel observable for gluon orbital angular momentum (talk) - QCD Evolution Workshop 2022
May 13, 2022 - University of Virginia, Virginia, USA
- First lattice study of twist-3 functions from quasi-PDF approach (seminar) - Virtual Lattice Field Theory Colloquium Series
April 14, 2022 - MIT, USA
- g_{1T} extraction (talk) - Correlations in Partonic and Hadronic Interactions workshop (CPHI-2022)
March 7, 2022 - ZOOM
- First global QCD analysis of the worm-gear TMD $g_{1T}(x, \vec{k}_\perp^2)$ (seminar) - RIKEN BNL Research Center (RBRC) Seminars/ Nuclear Theory (NT) Seminars
February 3, 2022 - Brookhaven National Laboratory, Upton, USA
- 2021 ■ An exploratory study of twist-3 PDFs using quasi-PDF approach (seminar) - Jefferson Lab Theory Seminars
May 17, 2021 - Jefferson Lab, Virginia, USA
- Exploring twist-3 PDFs $g_T(x)$, $e(x)$, and $h_L(x)$ in lattice QCD using quasi-PDF approach (seminar) - The International Light Cone Advisory Committee (ILCAC) Seminar
February 3, 2021 - ZOOM
- 2020 ■ Exclusive double quarkonium production and generalized TMDs of gluons (talk) - Quarkonia as Tools 2020
January 14, 2020 - Centre Paul Langevin, Aussois, France
- 2019 ■ Quasi-distribution approach to unveil GPDs: A discussion within and beyond models (seminar) - Department Seminar
September 24, 2019 - University of Pavia, Pavia, Italy
- Quasi-GPDs for quarks: Model results and beyond (seminar) - Jefferson Lab Theory Seminars
July 15, 2019 - Jefferson Lab, Virginia, USA

Contributed Talks

- 2024 ■ Probing quark orbital angular momentum in ep collisions - 31st International Workshop on Deep Inelastic Scattering and Related Subjects
April 9, 2024 - Maison MINATEC, Grenoble, France
- 2023 ■ Anomalies in GPDs - QGT Collaboration meeting
September 9, 2023 - Temple University, Philadelphia, USA

Talks (continued)

- A new approach for computing GPDs from asymmetric frames - The 40th International Symposium on Lattice Field Theory
August 3, 2023 - Fermilab, Batavia, Illinois, USA
- A novel approach for calculating GPDs from asymmetric frames - The 2023 Meeting on Lattice Parton Physics from Large Momentum Effective Theory (LaMET2023)
July 26, 2023 - University of Regensburg, Germany
- Theoretical aspects of a Lorentz-invariant decomposition for GPDs - QGT Collaboration meeting
June 9, 2023 - ZOOM
- Unraveling anomalies in Deep Virtual Compton Scattering - 30th International Workshop on Deep Inelastic Scattering and Related Subjects
March 28, 2023 - Michigan State University, Michigan, USA
- 2022 ■ GPDs in non-symmetric frames - The 39th International Symposium on Lattice Field Theory
August 11, 2022 - Hörsaalzentrum Poppelsdorf, Germany
- Observable for gluon orbital angular momentum – 29th International Workshop on Deep Inelastic Scattering and Related Subjects
May 5, 2022 - Santiago de Compostela, Spain
- Global analysis of g_{1T} TMD – APS April Meeting 2022
April 10, 2022 - ZOOM
- 2021 ■ First global extraction of the worm-gear TMD – 24th International Spin Symposium (SPIN 2021)
October 22, 2021 - ZOOM
- Role played by the zero modes in the matching for the twist-3 PDFs – 24th International Spin Symposium (SPIN 2021)
October 21, 2021 – ZOOM
- Extraction of the worm-gear TMD $g_{1T}(x, \vec{k}_\perp^2)$ COMPASS, HERMES and JLab data on semi-inclusive DIS – Particles and Nuclei International Conference (PANIC) 2021
September 8, 2021 – ZOOM
- Zero modes and Matching for the twist-3 PDFs – 28th International Workshop on Deep Inelastic Scattering and Related Topics
April 14, 2021 – ZOOM
- Non-trivialities in the Matching for the twist-3 PDFs – 9th workshop of the APS topical Group on Hadronic Physics
April 13, 2021 – ZOOM
- 2020 ■ Matching for the twist-3 PDFs $g_T(x)$, $e(x)$, and $h_L(x)$: Success or failure? – The 2020 Meeting on Lattice Parton Physics from Large-Moment Effective Theory (LaMET2020)
September 11, 2020 – ZOOM
- 2019 ■ Going off the light-cone – a model study of quasi-GPDs – Light Cone 2019
September 18, 2019 – Ecole Polytechnique, Palaiseau, France
- What can we learn about twist-2 GPDs through quasi-distributions? – International Nuclear Physics Conference (INPC) 2019
July 30, 2019 – Scottish Event Campus, Glasgow, UK
- Studying twist-2 GPDs through quasi-distributions in a scalar diquark model – 27th International Workshop on Deep Inelastic Scattering and Related Topics
April 10, 2019 – University of Torino, Torino, Italy
- 2018 ■ Generalized TMDs in hadronic collisions – Light Cone 2018
May 17, 2018 – Jefferson Lab, Virginia, USA

Talks (continued)

- 2017  Accessing Generalized TMDs through double Drell-Yan and double charmonium production processes – 26th International Workshop on Deep Inelastic Scattering and Related Topics
April 19, 2018 – Kobe University Convention Center, Kobe, Japan
- 2017  Generalized TMDs in the exclusive double Drell-Yan process – 25th International Workshop on Deep Inelastic Scattering and Related Topics
April 5, 2017 – University of Birmingham, Birmingham, UK

Research Spotlight: Media Coverage and DOE Highlights

- 2023  [Calculations Reveal High-Resolution View of Quarks Inside Protons](#)
-  [Theory Offers a High-Resolution View of Quarks Inside Protons](#)
- 2022  [Theorists Propose a Novel Way to Measure Gluons' Orbital Motion](#)

Teaching Experience

- 2015 – 2017  **Teaching Assistant, Temple University**
Instructed, supervised, and graded labs for introductory physics courses for undergraduate students

Synergistic Endeavors

Academic Engagement

- 2025  Organizer of the '11th Biennial Workshop of the APS Topical Group on Hadronic Physics (GHP2025)' (14-16 March) in Anaheim, CA, USA
- 2024  Organizer of the workshop on 'From quarks and gluons to the internal dynamics of hadrons' (15-17 May) at the CFNS, Stony Brook University
-  Organizer of the workshop on 'Generalized parton distributions for nucleon tomography in the EIC era' (17-19 January) at BNL
- 2023  Organizer of the workshop on 'TMDs: Towards a Synergy between Lattice QCD and Global Analyses' (21-23 June) at the CFNS, Stony Brook University
-  Scientific Reviewer for Physical Review Letters, Physical Review D, Physics Letters B, European Physical Journal C, European Physical Journal Plus, Nuclear Physics A
- 2021 – 2024  Organizer of seminars for the Center for Frontiers in Nuclear Science (CFNS) at Stony Brook University

Diversity, Equity, and Inclusion and Outreach Initiatives

- Jan. 8, 2024  I received an invitation to deliver a presentation on my career journey to the 2024 summer interns at BNL. This audience comprised underrepresented undergraduate students from around the world. The title of my talk was 'My Career in Physics and Beyond', with my primary goal being to inspire and motivate them to pursue STEM.

Synergistic Endeavors (continued)

- Nov. 15, 2023  I presented a talk titled '*Engaging the Next Generation in Science*' at the Office of Educational Programs at BNL. During this presentation, I engaged with undergraduate Fall interns from around the world, discussing my career journey, the factors that ignited my interest in STEM, the path that eventually brought me to BNL, and introducing them to my research. My primary aim was to inspire them, with a particular emphasis on underrepresented groups, to consider STEM as a future pursuit.
- Nov. 11, 2023  The Women in Science and Engineering (WISE) Program at Stony Brook University is dedicated to increasing the representation of individuals from underrepresented groups in STEM fields through outreach, recruitment, and retention initiatives. As part of my commitment to WISE, I instructed sophomore participants in the program on the fundamentals of QCD and guided them through one of my research projects conducted at BNL. The selected project was titled '*Decoding Nature's Blueprints: Unveiling Quarks through Data Analysis*'. This hands-on project focused on extracting crucial parton distribution functions, particularly those of quarks, from experimental data. I taught them how to employ advanced data analysis and modeling techniques with the goal of uncovering the intricate quark patterns within protons and neutrons. My initiative was spotlighted in an article by the [BNL Media and Communications Office](#), as well as by the [Stony Brook University News](#). This initiative was also highlighted in the [DOE Office of Science Research News](#).