Keping Xie

November 14, 2024

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Education and training

- **Postdoctoral Associate**, 09/2023 – present
  Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824
  Supervisors: Kirtimaan Mohan and C.-P. Yuan
- **Postdoctoral Associate**, 09/2019 – 08/2023
  Pittsburgh Particle Physics, Astrophysics, and Cosmology Center (PITT PACC),
  Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA 15260
  Supervisors: Tao Han and Ayres Freitas
- **Ph.D. in Physics**, 08/2014 – 08/2019
  Department of Physics, Southern Methodist University, Dallas, TX 75275-0181
  Advisors: Pavel Nadolsky and Roberto Vega
  Thesis: Massive elementary particles in the Standard Model and its supersymmetric triplet Higgs extension [link]
- **B.S. in Physics**, 09/2010 – 07/2014
  School of Physics, Peking University, Beijing 100871, China
  Advisor: Han-Qing Zheng

Research interests

I work on the high-energy phenomenology, which bridges the theoretical and experimental particle physics. My efforts mainly focus on the precision and resummation calculations. As a member of the CTEQ-TEA (CT) collaboration, I participate in the development of a new generation of QCD parton distribution functions (PDFs), CT18, and the corresponding QED corrections (CT18QED), which are widely used for physics exploration at the hadron colliders. Recently, I dedicate to the electroweak (EW) factorization, which involves the EW gauge bosons as well as Higgs bosons as partons to resum large logarithms as PDFs for initial-state radiations and fragmentation functions (FFs) for final-state radiations. Another focus of my research is heavy-flavor physics, which requires a general-mass composite scheme to match the high energy regime, where the heavy-flavor particle can be excited as an active massless parton, to the low energy region, in which heavy flavors can be only dynamically created through light flavors. I am also interested in perturbative high-order calculations, small-x and q_T resummations, Higgs bosons, and effective field theory.

Inspire HEP			Google Scholar		
	Citeable	Published		All	Since 2019
Papers	67	29			
Citations	3480	2348		3141	3063
h-index	26	18		24	24
Average	51.9	81	i10-index	41	39

Table 1: Publications and citations

Publications

The latest list of my publications, including citations, can be viewed in the data bases of INSPIRE HEP, Google Scholar, and Sematic Scholar.

[1] **MuCoL** Collaboration, C. Accettura *et al.*, "MuCol Milestone Report No. 5: Preliminary Parameters," arXiv:2411.02966 [physics.acc-ph].

[2] A. Ablat, S. Dulat, M. Guzzi, T.-J. Hou, N. Kidonakis, I. Sitiwaldi, A. Tonero, K. Xie, and C. P. Yuan, "Progress in top-quark pair production cross section calculations and impact on parton distribution functions of the proton," in *12th Large Hadron Collider Physics Conference*. 10, 2024. arXiv:2411.00055 [hep-ph].

[3] M. Guzzi, P. Nadolsky, L. Reina, D. Wackeroth, and K. Xie, "General Mass treatment for Z boson production in association with a heavy quark at hadron colliders," in *31st International Workshop on Deep-Inelastic Scattering and Related Subjects*. 10, 2024. arXiv:2410.13044 [hep-ph].

[4] Y. Ma, E. Celada, T. Han, W. Kilian, N. Kreher, F. Maltoni, D. Pagani, J. Reuter, T. Striegl, and K. Xie, "Higgs-muon interactions at a multi-TeV muon collider," arXiv:2410.06991 [hep-ph].

[5] M. Guzzi, P. Nadolsky, L. Reina, D. Wackeroth, and K. Xie, "A general mass variable flavor number scheme for Z boson production in association with a heavy quark at hadron colliders," arXiv:2410.03876 [hep-ph].

[6] A. Ablat *et al.*, "The upcoming CTEQ-TEA parton distributions in a nutshell," arXiv:2408.11131 [hep-ph].

[7] A. Ablat *et al.*, "New results in the CTEQ-TEA global analysis of parton distributions in the nucleon," arXiv:2408.04020 [hep-ph].

[8] **International Muon Collider** Collaboration, C. Accettura *et al.*, "Interim report for the International Muon Collider Collaboration (IMCC)," arXiv:2407.12450 [physics.acc-ph].

[9] W. Altmannshofer, T. Mäkelä, S. Sarkar, S. Trojanowski, K. Xie, and B. Zhou, "Discovering neutrino tridents at the Large Hadron Collider," *Phys. Rev. D* **110** no. 7, (2024) 072018, arXiv:2406.16803 [hep-ph].

[10] E. Celada, T. Han, W. Kilian, N. Kreher, Y. Ma, F. Maltoni, D. Pagani, J. Reuter, T. Striegl, and K. Xie, "Probing Higgs-muon interactions at a multi-TeV muon collider," *JHEP* **08** (2024) 021, arXiv:2312.13082 [hep-ph].

[11] A. Dasgupta, P. S. B. Dev, T. Han, R. Padhan, S. Wang, and K. Xie, "Searching for heavy leptophilic Z': from lepton colliders to gravitational waves," *JHEP* **12** (2023) 011, arXiv:2308.12804 [hep-ph].

[12] A. Ablat, M. Guzzi, K. Xie, S. Dulat, T.-J. Hou, I. Sitiwaldi, and C. P. Yuan, "Exploring the impact of high-precision top-quark pair production data on the structure of the proton at the LHC," *Phys. Rev. D* **109** no. 5, (2024) 054027, arXiv:2307.11153 [hep-ph].

[13] X. Jing *et al.*, "Quantifying the interplay of experimental constraints in analyses of parton distributions," *Phys. Rev. D* **108** no. 3, (2023) 034029, arXiv:2306.03918 [hep-ph].

[14] A. Freitas, Q. Song, and K. Xie, "Fermionic electroweak NNLO corrections to e+e-→ZH with polarized beams and different renormalization schemes," *Phys. Rev. D* **108** no. 5, (2023) 053006, arXiv:2305.16547 [hep-ph].

[15] **CTEQ-TEA** Collaboration, I. Sitiwaldi, K. Xie, A. Ablat, S. Dulat, T.-J. Hou, and C. . P. Yuan, "Precision studies of the post-CT18 LHC Drell-Yan data in the CTEQ-TEA global analysis," *Phys. Rev. D* **108** no. 3, (2023) 034030, arXiv:2305.10733 [hep-ph].

[16] **CTEQ-TEA** Collaboration, K. Xie, B. Zhou, and T. J. Hobbs, "The photon content of the neutron," *JHEP* **04** (2024) 022, arXiv:2305.10497 [hep-ph].

[17] **CTEQ-TEA** Collaboration, K. Xie, J. Gao, T. J. Hobbs, D. R. Stump, and C. P. Yuan, "High-energy neutrino deep inelastic scattering cross sections," *Phys. Rev. D* **109** no. 11, (2024) 113001, arXiv:2303.13607 [hep-ph].
[18] C. Accettura *et al.*, "Towards a muon collider," *Eur. Phys. J. C* **83** no. 9, (2023) 864, arXiv:2303.08533 [physics.acc-ph]. [Erratum: Eur.Phys.J.C 84, 36 (2024)].
[19] J. Reuter, T. Han, W. Kilian, N. Kreher, Y. Ma, T. Striegl, and K. Xie, "Precision test of the muon-Higgs coupling at a high-energy muon collider," *PoS* **ICHEP2022** (2022) 1239, arXiv:2212.01323 [hep-ph].
[20] M. Guzzi, T. J. Hobbs, K. Xie, J. Huston, P. Nadolsky, and C. P. Yuan, "The persistent nonperturbative charm enigma," *Phys. Lett. B* **843** (2023) 137975, arXiv:2211.01387 [hep-ph].
[21] B. Batell, T. Ghosh, T. Han, and K. Xie, "Heavy neutral leptons at the Electron-Ion Collider," *JHEP* **03** (2023) 020, arXiv:2210.09287 [hep-ph].
[22] F. Maltoni *et al.*, "TF07 Snowmass Report: Theory of Collider Phenomena," arXiv:2210.02591 [hep-ph].
[23] M. Begel *et al.*, "Precision QCD, Hadronic Structure & Forward QCD, Heavy Ions: Report of Energy Frontier Topical Groups 5, 6, 7 submitted to Snowmass 2021," arXiv:2209.14872 [hep-ph].
[24] T. Bose *et al.*, "Report of the Topical Group on Physics Beyond the Standard Model at Energy Frontier for Snowmass 2021," arXiv:2209.13128 [hep-ph].
[25] M. Guzzi, A. Ablat, S. Dulat, T.-J. Hou, P. M. Nadolsky, I. Sitiwaldi, K. Xie, and C. P. Yuan, "Heavy-flavor impact on CTEQ-TEA global QCD analyses," *EPJ Web Conf.* **270** (2022) 00004, arXiv:2209.11143 [hep-ph].
[26] K. Agashe *et al.*, "Report of the Topical Group on Top quark physics and heavy flavor production for Snowmass 2021," arXiv:2209.11267 [hep-ph].
[27] A. Belloni *et al.*, "Report of the Topical Group on Electroweak Precision Physics and Constraining New Physics for Snowmass 2021," arXiv:2209.08078 [hep-ph].
[28] K. M. Black *et al.*, "Muon Collider Forum report," *JINST* **19** no. 02, (2024) T02015, arXiv:2209.01318 [hep-ex].
[29] A. Courtoy, J. Huston, P. Nadolsky, K. Xie, M. Yan, and C. P. Yuan, "Parton distributions need representative sampling," *Phys. Rev. D* **107** no. 3, (2023) 034008, arXiv:2205.10444 [hep-ph].
[30] J. Gao, D. Liu, and K. Xie, "Understanding PDF uncertainty in W boson mass measurements*," *Chin. Phys. C* **46** no. 12, (2022) 123110, arXiv:2205.03942 [hep-ph].
[31] S. Amoroso *et al.*, "Snowmass 2021 Whitepaper: Proton Structure at the Precision Frontier," *Acta Phys. Polon. B* **53** no. 12, (2022) 12–A1, arXiv:2203.13923 [hep-ph].
[32] R. Abdul Khalek *et al.*, "Snowmass 2021 White Paper: Electron Ion Collider for High Energy Physics," arXiv:2203.13199 [hep-ph].
[33] T. Han, Y. Ma, and K. Xie, "Electroweak fragmentation at high energies: A Snowmass White Paper," in *Snowmass 2021*. 3, 2022. arXiv:2203.11129 [hep-ph].
[34] J. M. Campbell *et al.*, "Event generators for high-energy physics experiments," *SciPost Phys.* **16** no. 5, (2024) 130, arXiv:2203.11110 [hep-ph].
[35] **Muon Collider** Collaboration, N. Bartosik *et al.*, "Simulated Detector Performance at the Muon Collider," arXiv:2203.07964 [hep-ex].
[36] **Muon Collider** Collaboration, D. Stratakis *et al.*, "A Muon Collider Facility for Physics Discovery," arXiv:2203.08033 [physics.acc-ph].
[37] D. d'Enterria *et al.*, "The strong coupling constant: state of the art and the decade ahead," *J. Phys. G* **51** no. 9, (2024) 090501, arXiv:2203.08271 [hep-ph].
[38] **Muon Collider** Collaboration, S. Jindariani *et al.*, "Promising Technologies and R&D Directions for the Future Muon Collider Detectors," arXiv:2203.07224

[physics.ins-det].
[39] **Muon Collider** Collaboration, J. de Blas *et al.*, "The physics case of a 3 TeV muon collider stage," arXiv:2203.07261 [hep-ph].
[40] **ILC International Development Team** Collaboration, A. Aryshev *et al.*, "The International Linear Collider: Report to Snowmass 2021," arXiv:2203.07622 [physics.acc-ph].
[41] **Nu-Test** Collaboration, B. Batell, T. Ghosh, T. Han, and K. Xie, "Heavy Neutral Lepton Searches at the Electron-Ion Collider: A Snowmass Whitepaper," in *Snowmass 2021*. 3, 2022. arXiv:2203.06705 [hep-ph].
[42] K. Xie, M. Guzzi, and P. Nadolsky, "Probing heavy-flavor parton distribution functions at hadron colliders," in *Snowmass 2021*. 3, 2022. arXiv:2203.06207 [hep-ph].
[43] **PDF4LHC Working Group** Collaboration, R. D. Ball *et al.*, "The PDF4LHC21 combination of global PDF fits for the LHC Run III," *J. Phys. G* **49** no. 8, (2022) 080501, arXiv:2203.05506 [hep-ph].
[44] J. L. Feng *et al.*, "The Forward Physics Facility at the High-Luminosity LHC," *J. Phys. G* **50** no. 3, (2023) 030501, arXiv:2203.05090 [hep-ex].
[45] M. Guzzi, K. Xie, T.-J. Hou, P. Nadolsky, C. Schmidt, M. Yan, and C. P. Yuan, "CTEQ-TEA group updates: Photon PDF and Impact from heavy flavors in the CT18 global analysis," *PoS* **EPS-HEP2021** (2022) 370, arXiv:2110.11495 [hep-ph].
[46] L. A. Anchordoqui *et al.*, "The Forward Physics Facility: Sites, experiments, and physics potential," *Phys. Rept.* **968** (2022) 1–50, arXiv:2109.10905 [hep-ph].
[47] M. Guzzi *et al.*, "NNLO constraints on proton PDFs from the SeaQuest and STAR experiments and other developments in the CTEQ-TEA global analysis," *SciPost Phys. Proc.* **8** (2022) 005, arXiv:2108.06596 [hep-ph].
[48] T. Han, W. Kilian, N. Kreher, Y. Ma, J. Reuter, T. Striegl, and K. Xie, "Precision test of the muon-Higgs coupling at a high-energy muon collider," *JHEP* **12** (2021) 162, arXiv:2108.05362 [hep-ph].
[49] K. Xie, J. M. Campbell, and P. M. Nadolsky, "A general-mass scheme for prompt charm production at hadron colliders," *SciPost Phys. Proc.* **8** (2022) 084, arXiv:2108.03741 [hep-ph].
[50] M. Guzzi, P. Nadolsky, and K. Xie, "Impact of heavy-quark production measurements in the CT18 global QCD analysis of PDFs," *SciPost Phys. Proc.* **8** (2022) 164, arXiv:2108.01791 [hep-ph].
[51] K. Xie, T. Hobbs, T.-J. Hou, C. Schmidt, M. Yan, and C.-P. Yuan, "The photon content of the proton in the CT18 global analysis," *SciPost Phys. Proc.* **8** (2022) 074, arXiv:2107.13580 [hep-ph].
[52] **CTEQ-TEA** Collaboration, K. Xie, T. J. Hobbs, T.-J. Hou, C. Schmidt, M. Yan, and C. P. Yuan, "Photon PDF within the CT18 global analysis," *Phys. Rev. D* **105** no. 5, (2022) 054006, arXiv:2106.10299 [hep-ph].
[53] D. Buarque Franzosi *et al.*, "Vector boson scattering processes: Status and prospects," *Rev. Phys.* **8** (2022) 100071, arXiv:2106.01393 [hep-ph].
[54] T. Han, Y. Ma, and K. Xie, "Quark and gluon contents of a lepton at high energies," *JHEP* **02** (2022) 154, arXiv:2103.09844 [hep-ph].
[55] S. Klein *et al.*, "New opportunities at the photon energy frontier," arXiv:2009.03838 [hep-ph].
[56] T. Han, Y. Ma, and K. Xie, "High energy leptonic collisions and electroweak parton distribution functions," *Phys. Rev. D* **103** no. 3, (2021) L031301, arXiv:2007.14300 [hep-ph].
[57] T.-J. Hou *et al.*, "New CTEQ global analysis of quantum chromodynamics with high-precision data from the LHC," *Phys. Rev. D* **103** no. 1, (2021) 014013,

arXiv:1912.10053 [hep-ph].
[58] T.-J. Hou *et al.*, "New CTEQ Global Analysis with High Precision Data from the LHC," arXiv:1908.11238 [hep-ph].
[59] T.-J. Hou *et al.*, "Progress in the CTEQ-TEA NNLO global QCD analysis," arXiv:1908.11394 [hep-ph].
[60] T.-J. Hou *et al.*, "LHC and DIS experimental datain the CT18(Z) global QCD analysis," *PoS* **DIS2019** (2019) 021, arXiv:1909.00001 [hep-ph].
[61] O. Amat *et al.*, "Impact of LHC top-quark pair measurements to CTEQ-TEA PDF analysis," *PoS* **DIS2019** (2019) 017, arXiv:1908.06441 [hep-ph].
[62] C. P. Yuan *et al.*, "New CTEQ global analysis with high precision data from the LHC," *PoS* **DIS2019** (2019) 001.
[63] K. Xie, *Massive elementary particles in the Standard Model and its supersymmetric triplet Higgs extension*. PhD thesis, Southern Methodist U. (main), Southern Methodist U., 2019.
[64] M. Guzzi, T.-J. Hou, S. Dulat, J. Gao, J. Huston, P. Nadolsky, C. Schmidt, J. Winter, K. Xie, and C. P. Yuan, "CTEQ-TEA parton distribution functions with intrinsic charm," *EPJ Web Conf.* **192** (2018) 00003, arXiv:1810.00264 [hep-ph].
[65] R. Vega, R. Vega-Morales, and K. Xie, "Light (and darkness) from a light hidden Higgs," *JHEP* **06** (2018) 137, arXiv:1805.01970 [hep-ph].
[66] R. Vega, R. Vega-Morales, and K. Xie, "The Supersymmetric Georgi-Machacek Model," *JHEP* **03** (2018) 168, arXiv:1711.05329 [hep-ph].
[67] M. Guzzi, T.-J. Hou, S. Dulat, J. Gao, J. W. Huston, P. Nadolsky, C. Schmidt, J. Winter, K. Xie, and C. P. Yuan, "CTEQ-TEA parton distributions functions with intrinsic charm," *PoS* **DIS2017** (2018) 030.
[68] T.-J. Hou, S. Dulat, J. Gao, M. Guzzi, J. Huston, P. Nadolsky, C. Schmidt, J. Winter, K. Xie, and C. P. Yuan, "CT14 Intrinsic Charm Parton Distribution Functions from CTEQ-TEA Global Analysis," *JHEP* **02** (2018) 059, arXiv:1707.00657 [hep-ph].
[69] T.-J. Hou *et al.*, "CT14 Monte-Carlo parton distributions with positivity and asymmetric uncertainties," *PoS* **DIS2016** (2016) 034.
[70] T.-J. Hou *et al.*, "Reconstruction of Monte Carlo replicas from Hessian parton distributions," *JHEP* **03** (2017) 099, arXiv:1607.06066 [hep-ph].
[71] J. R. Andersen *et al.*, "Les Houches 2015: Physics at TeV Colliders Standard Model Working Group Report," in *9th Les Houches Workshop on Physics at TeV Colliders*. 5, 2016. arXiv:1605.04692 [hep-ph].

Recent presentations

Seminars

1. **High-energy neutrino deep inelastic scattering cross sections**
   Fermilab Neutrino Seminar, Fermilab, Batavia, IL, 03/2024
2. **Parton Distributions for the Precision Era at the LHC**
   LPC Physics Forum, Fermilab, Batavia, IL, 10/2023
3. **Electroweak factorization and parton distribution functions**
   Physics Seminar, Wichita State University, Wichita, KS, 10/2023
4. **Electroweak parton distribution functions and their applications at future high-energy muon colliders**
   Theory Seminar, Jefferson Lab, Newport News, VA, 11/2022
   High Energy Physics Seminar, Michigan State University, East Lansing, MI, 09/2022

5. **Bread & Butter Physics at High-energy Muon Colliders**
   SYSU-PKU Collider Physics forum For Young Scientists, Virtual, 06/2022
   Department of Physics, Southern Methodist University, Dallas, TX, 04/2022
6. **The photon content of proton in the CT18 global analysis**
   Institute of Nuclear Physics, Polish Academy of Sciences, Krakow, Poland, 11/2021
7. **The partonic picture at high-energy lepton colliders**
   Seminar at Tsung-Dao Lee Institute & School of Physics and Astronomy, Shanghai Jiao Tong University, Shanghai, China, 06/2021
8. **Light Exotic Higgs Bosons at the LHC**
   Department of Physics, Southern Methodist University, Dallas, TX, 03/2019
   Theoretical Physics Department, Fermilab, Batavia, IL, 11/2018

Plenary talks

1. **A general mass variable flavor number scheme for Z boson associated with a heavy quark production at hadron colliders**
   LoopFest XXII, Southern Methodist University, Dallas, TX, 05/2024
2. **New physics searches at the EIC**
   Electroweak and Beyond the Standard Model Physics at the EIC, INT Workshop, University of Washington, Seattle, WA, 02/2024
3. **Parton distributions for the LHC precision era**
   27th Mini-Workshop on the frontier of LHC, Sun Yat-Sen University, Zhuhai, Guangzhou, China, 01/2024
4. **Heavy neutral leptons and related new physics at the Electron-Ion Collider**
   The 17th International Workshops on Tau Lepton Physics (TAU2023), University of Louisville, Louisville, KY, 12/2023
5. **Electroweak Factorization**
   Muon Collider Physics Benchmark Workshop, University of Pittsburgh, PA, 11/2023
6. **Parton distribution functions at the electron-ion collider, forward physics facility and its impact on top-quark measurement at the LHC**
   16th International Workshop on Top Quark Physics (TOP2023), Traverse City, MI, 09/2023
7. **Heavy neutral leptons at the Electron-Ion Collider**
   1st International Workshop on a 2nd Detector for the Electron-ion Collider, Temple University, Philadelphia, PA, 05/2023
8. **Electroweak Factorization at High-Energy Muon Colliders**
   Muon Collider Workshop, KITP Program, University of California, Santa Barbara, CA, 02/2023
9. **New Physics Searches at the EIC**
   IAS Program on High Energy Physics (HEP 2023), the Hong Kong University of Science and Technology, Hong Kong, 02/2023
10. **Electroweak parton distributions at high-energy lepton colliders**
    Parton Distributions and Nucleon Structure, INT Workshop, University of Washington, Seattle, WA, 09/2022
11. **Electroweak Showers at High-Energy Colliders**
    Multi-Boson Interactions (MBI) 2022, Shanghai, China, 08/2022

12. **Heavy neutral lepton searches at the electron-ion collider**
    11th Workshop of the Long-Lived Particle Community, Virtual, CERN, 06/2022
13. **Quark and gluon contents of a lepton at high energies**
    Muon Collider Physics and Detector Workshop, International Muon Collider Collaboration, 06/2021
14. **Electroweak Parton Distribution Functions**
    Winter 2021 topical meeting on VBS: VBS at Snowmass, VBSCan Action, 01/2021
15. **Standard Model physics at high-energy muon colliders**
    PITT PACC Worksop: Muon Collider Physics, University of Pittsburgh, PA, 12/2020

Parallel talks

1. **Multi-Boson Production to Test Muon-Higgs Interactions at Muon Colliders**
   Inaugural US Muon Collider Meeting, Fermilab, Batavia, IL, 08/2024
2. **The photon content of neutron**
   Pheno-DPF 2024, University of Pittsburgh, PA, 05/2024
   CTEQ Fall Meeting 2023, Michigan State University, East Lansing, MI, 11/2023
3. **Forward D-meson production at the LHC**
   Forward Physics Facility Theory Workshop, CERN, Geneva, Switzerland, 09/2023
4. **The Heavy-Flavor Production at the LHC**
   SM@LHC 2023, Fermilab, Batavia, IL, 07/2023
5. **High-energy neutrino cross sections**
   Phenomenology 2023 Symposium, University of Pittsburgh, PA, 05/2023
   PIKIMO Spring Meeting 2023, Ohio State University, OH, 04/2023
   APS April Meeting 2023, Minneapolis, MN, 04/2023
6. **Impacts of LHC Drell-Yan data in the CTEQ-TEA global fit**
   DIS 2023, Michigan State University, East Lansing, MI, 03/2023
   DIS 2022, Santiago de Compostela, Spain, 05/2022
7. **The small-x dynamics in the CTEQ-TEA PDFs and the application to the Forward Physics Facility**
   DIS 2023, Michigan State University, East Lansing, MI, 03/2023
8. **Ongoing activities related to the heavy-flavor impact on CTEQ global analyses**
   CTEQ Fall Meeting 2022, Fermilab, Batavia, IL, 11/2022
9. **Overview of Parton Distribution Functions**
   Invited overview in the EF05/06/07 joint session, the Community Summer Study, Seattle, WA, 07/2022
10. **Electroweak fragmentations at high energies**
    Invited in EF04 Topical Group at the Community Summer Study, Seattle, WA, 07/2022
11. **Heavy Neutral Lepton Searches at the Electron-Ion Collider**
    PPC 2022, Washington University in St. Louis, Missouri, 06/2022
12. **The Update of the CT18QED Photon PDF**
    DIS 2022, Santiago de Compostela, Spain, 05/2022
13. **The parton distributions at small momentum fractions**
    DIS 2022, Santiago de Compostela, Spain, 05/2022

14. **The partonic picture at high-energy lepton colliders**
    CTEQ Fall Meeting 2021, Online, 12/2021
15. **Precision Test of the Muon-Higgs Coupling at a High-energy Muon Collider**
    Higgs 2021, Stony Brook University, NY, 10/2021
    Invited talk in "Lepton Colliders" Session, SUSY 2021, ITP-CAS, Beijing, China, 08/2021
16. **Photon PDF and Impact from heavy flavors in the CT18 global analysis**
    The European Physical Society Conference on High Energy Physics, University of Hamburg and DESY, Germany, 07/2021
17. **Nonperturbative contributions to the photon PDF uncertainty in the CT18 global analysis**
    19th International Conference on Hadron Spectroscopy and Structure, Mexico City, Mexico, 07/2021
18. **The Photon PDF within the CT18 global analysis**
    2021 APS DPF Meeting, Florida State University, Tallahassee, FL, 07/2021
    DIS 2021, Stony Brook University, NY, 04/2021
19. **A next-to-leading order method general-mass method for heavy-flavor production at the LHC**
    DIS 2021, Stony Brook University, NY, 04/2021
20. **BSM Physics at the Electron Ion Collider: Searching for Heavy Neutral Leptons**
    Snowmass RF4 meeting, Virtual, 10/2020
21. **Small-x PDFs in the CTEQ-TEA global QCD analysis**
    Snowmass EF06 meeting, Virtual, 07/2020
22. **The Electroweak PDFs (I): the general considerations**
    Phenomenology 2020 Symposium, University of Pittsburgh, PA, 05/2020
23. **New CTEQ Global Analysis with High Precision Data from the LHC**
    8th PIKIMO Meeting, University of Cincinnati, OH, 11/2019
    APS April Meeting, Denver, CO, 04/2019
24. **Heavy flavor production at hadron colliders**
    QCD@LHC 2019, State University of New York at Buffalo, NY, 07/2019
    Phenomenology 2019 Symposium (Travel Award), University of Pittsburgh, PA, 05/2019
25. **Light Exotic Higgs Bosons in the Supersymmetric Georgi-Machacek Model**
    SUSY 2019, Texas A&M University - Corpus Christi, TX, 05/2019
26. **Next-to-leading order general-mass scheme for heavy-quark production at the LHC**
    Parton Distributions as a Bridge from Low to High Energies Workshop, Jefferson Lab, Newport News, VA, 11/2018
27. **Light (and darkness) from a light hidden Higgs**
    6th PIKIO Meeting, University of Notre Dame, IN, 10/2018
28. **The Supersymmetric Georgi-Machacek Model**
    Phenomenology 2018 Symposium, University of Pittsburgh, PA, 05/2018
29. **A hint of a new heavy particle at the LHC: *What do we see? What can it be?***
    Research Day Poster Session (Dean's Award), Southern Methodist University, Dallas, TX 02/2016

30. **Heavy-quark mass treatment for deep inelastic scattering at N3LO level**
Fall 2015 Texas Section of APS Meeting (Travel Award), Baylor University, Waco, TX, 10/2015

Public tools

- I extend the Error PDF Updating Method Package (ePump) to simultaneously constrain the PDF and SMEFT parameters.
- I am the leading author for the S-ACOT-MPS package, *i.e.*, the Simplified Aivazis-Collins-Olness-Tung scheme with Massive Phase Space. It is designed to deal with the heavy-flavor hadroproduction, especially at the Large Hadron Collider (LHC).
- I develop and maintain the SARAH model files for the Supersymmetric Georgi-Machacek (SGM) Model, a decoupling limit of the Supersymmetric Custodial Triplet Model (SCTM), which gives a weakly coupled origin for the GM model at the electroweak scale.

Professional activities and service

- **Organization committee for conferences, workshops, and summer schools**
  - PITT PACC Workshops: New Physics at Neutrino Facilities (2022); 11th PIKIMO (2021); LHC Run III Workshop (2021); Muon Collider Physics (2020)
  - 2022 CTEQ Summer School
  - LoopFest XX (2022)
  - Phenomenology Symposium, 2022, 2021, 2020
- **Convener** for 2021 CTEQ-MCnet Summer School (Virtual); Phenomenology Symposium 2019, Pittsburgh, PA; APS April Meeting 2019, Denver, CO
- **Referee** for journals and awards
  - *Journal of High Energy Physics*
  - *Physical Review D*
  - *Chinese Physics C*
  - *Nuclear Physics B*
  - *International Journal of Modern Physics A*
  - Advanced Scientific Computing Research Leadership Computing Challenge, 2022-23
- **Member** of the **CTEQ-TEA** and **PDF4LHC Working Group**
- **Visitor** at Fermilab, 2017 – 2018; Michigan State University, 2016
- **Research Assistant**, Southern Methodist University, 2015 – 2019
Nominee for the Student Employee of the Year, 2019
Lightner-Sams Graduate Fellowship 2018
- **Teaching Assistant**, Southern Methodist University, 2014 – 2015
Outstanding Teaching Assistant Award 2015

References

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