List of Achievements
As of November 2, 2026
(1) Papers
1) 2014.04 Symmetry breaking caused by large R-charge, JHEP 10, 136 (2014), doi:10.1007/JHEP10(2014)136, arXiv:1404.7639, co-authored, peer-reviewed
2) 2014.11 Determination of the mass anomalous dimension for Nf=12 and Nf=9 SU(3) gauge theories, PoS LATTICE2014, 252 (2014), doi:10.22323/1.214.0252, arXiv:1411.1155, co-authored, peer-reviewed
3) 2014.12 Axial U(1) symmetry at finite temperature with Möbius domain-wall fermions, PoS LATTICE2014, 210 (2014), doi:10.22323/1.214.0210, arXiv:1412.5703, co-authored, peer-reviewed
4) 2014.12 Effects of near-zero Dirac eigenmodes on axial U(1) symmetry at finite temperature, PoS LATTICE2014, 211 (2014), doi:10.22323/1.214.0211, arXiv:1412.7306, co-authored, peer-reviewed
5) 2015.03 Non-perturbative analysis of phase structure in SU(3) gauge theory, doi:10.18910/52308, single-authored, not peer-reviewed (PhD thesis)
6) 2015.10 Violation of chirality of the Möbius domain-wall Dirac operator from the eigenmodes, Phys.Rev.D 93 (2015), doi:10.1103/PhysRevD.93.034507, arXiv:1510.07395, co-authored, peer-reviewed
7) 2015.11 On the axial U(1) symmetry at finite temperature, PoS LATTICE2015, 196 (2015), doi:10.22323/1.251.0196, arXiv:1511.05691, co-authored, peer-reviewed
8) 2016.09 Detection of phase transition via convolutional neural network, J.Phys.Soc.Jap. 86 (2016), doi:10.7566/JPSJ.86.063001, arXiv:1609.09087, co-authored, peer-reviewed
9) 2016.12 Evidence of effective axial U(1) symmetry restoration at high temperature QCD, Phys.Rev.D 96 (2016), doi:10.1103/PhysRevD.96.034509, arXiv:1612.01908, co-authored, peer-reviewed
10) 2017.02 Quantum Quench and Scaling of Entanglement Entropy, Phys.Lett.B 772, 53 (2017), doi:10.1016/j.physletb.2017.06.017, arXiv:1702.04359, co-authored, peer-reviewed
11) 2017.11 Chiral phase transition of three flavor QCD with nonzero magnetic field using standard staggered fermions, EPJ Web Conf. 175 (2017), doi:10.1051/epjconf/201817507041, arXiv:1711.02884, co-authored, peer-reviewed
12) 2017.12 Entanglement Spreading and Oscillation, J.Stat.Mech. 1905 (2017), doi:10.1088/1742-5468/ab14d9, arXiv:1712.09899, co-authored, peer-reviewed
13) 2018.02 Deep learning and the AdS/CFT correspondence, Phys.Rev.D 98 (2018), doi:10.1103/PhysRevD.98.046019, arXiv:1802.08313, co-authored, peer-reviewed
14) 2018.09 Deep Learning and Holographic QCD, Phys.Rev.D 98 (2018), doi:10.1103/PhysRevD.98.106014, arXiv:1809.10536, co-authored, peer-reviewed
15) 2018.12 Phase transition encoded in neural network, PTEP 2019 (2018), doi:10.1093/ptep/ptz082, arXiv:1812.01522, co-authored, peer-reviewed
16) 2019.04 Phase structure of three flavor QCD in external magnetic fields using HISQ fermions, PoS LATTICE2018, 163 (2019), doi:10.22323/1.334.0163, arXiv:1904.01276, co-authored, peer-reviewed
17) 2019.06 Entanglement after Quantum Quenches in Lifshitz Scalar Theories, J.Stat.Mech. 1909 (2019), doi:10.1088/1742-5468/ab417f, arXiv:1906.05476, co-authored, peer-reviewed
18) 2020.01 Classically emulated digital quantum simulation of the Schwinger model with a topological term via adiabatic state preparation, Phys.Rev.D 105 (2020), doi:10.1103/PhysRevD.105.094503, arXiv:2001.00485, co-authored, peer-reviewed
19) 2020.01 Dirac Eigenvalue spectrum of Nf =2+1 QCD toward the chiral limit using HISQ fermions, PoS LATTICE2019, 251 (2020), doi:10.22323/1.363.0251, arXiv:2001.05217, co-authored, peer-reviewed
20) 2020.01 Meson masses in external magnetic fields with HISQ fermions, PoS LATTICE2019, 250 (2020), doi:10.22323/1.363.0250, arXiv:2001.05322, co-authored, peer-reviewed
21) 2020.03 Nonperturbative flavor breaking in topological susceptibility at chiral crossover, Phys.Lett.B 813 (2020), doi:10.1016/j.physletb.2020.136044, arXiv:2003.11375, co-authored, peer-reviewed
22) 2020.05 Analysis of nonperturbative flavor violation at chiral crossover criticality in QCD, Phys.Rev.D 103 (2020), doi:10.1103/PhysRevD.103.054034, arXiv:2005.07003, co-authored, peer-reviewed
23) 2020.06 Chiral phase structure of three flavor QCD in a background magnetic field, Phys.Rev.D 102 (2020), doi:10.1103/PhysRevD.102.054505, arXiv:2006.13422, co-authored, peer-reviewed
24) 2020.08 Chiral properties of (2+1)-flavor QCD in strong magnetic fields at zero temperature, Phys.Rev.D 104 (2020), doi:10.1103/PhysRevD.104.014505, arXiv:2008.00493, co-authored, peer-reviewed
25) 2020.10 Self-learning Monte Carlo for non-Abelian gauge theory with dynamical fermions, Phys.Rev.D 107 (2020), doi:10.1103/PhysRevD.107.054501, arXiv:2010.11900, co-authored, peer-reviewed

26) 2020.10 Correlated Dirac Eigenvalues and Axial Anomaly in Chiral Symmetric QCD, Phys.Rev.Lett. 126 (2020), doi:10.1103/PhysRevLett.126.082001, arXiv:2010.14836, co-authored, peer-reviewed
27) 2020.11 QCD phase structure in strong magnetic fields, doi:10.5506/APHYSPOLBSUPP.14.403, arXiv:2011.04870, co-authored, peer-reviewed
28) 2021.02 Detecting scale anomaly in chiral phase transition of QCD: new critical endpoint pinned down, JHEP 12, 175 (2021), doi:10.1007/JHEP12(2021)175, arXiv:2102.05294, co-authored, peer-reviewed
29) 2021.03 Gauge covariant neural network for quarks and gluons, Phys.Rev.D 111 (2021), doi:10.1103/PhysRevD.111.074501, arXiv:2103.11965, co-authored, peer-reviewed
30) 2021.06 New interpretation of the chiral phase transition: Violation of the trilemma in QCD, Phys.Rev.D 105 (2021), doi:10.1103/PhysRevD.105.114031, arXiv:2106.05674, co-authored, peer-reviewed
31) 2021.12 Correlated Dirac Eigenvalues and Axial Anomaly in Chiral Symmetric QCD, PoS LATTICE2021, 619 (2021), doi:10.22323/1.396.0619, arXiv:2112.00465, co-authored, peer-reviewed
32) 2021.12 HMC with Normalizing Flows, PoS LATTICE2021, 073 (2021), doi:10.22323/1.396.0073, arXiv:2112.01586, co-authored, peer-reviewed
33) 2021.12 New Indication from Quantum Chromodynamics Calling for beyond the Standard Model, Universe 10, 68 (2021), doi:10.3390/universe10020068, arXiv:2112.13533, co-authored, peer-reviewed
34) 2022.05 New Aspect of Chiral SU(2) and U(1) Axial Breaking in QCD, Particles 7, 237 (2022), doi:10.3390/particles7010014, arXiv:2205.12479, co-authored, peer-reviewed
35) 2022.08 Fate of the first-order chiral phase transition in QCD: Implications for dark QCD studied via a Nambu–Jona-Lasinio model, Phys.Rev.D 106 (2022), doi:10.1103/PhysRevD.106.095010, arXiv:2208.03975, co-authored, peer-reviewed
36) 2022.12 Use of Schwinger-Dyson equation in constructing an approximate trivializing map, PoS LATTICE2022, 229 (2022), doi:10.22323/1.430.0229, arXiv:2212.11387, co-authored, peer-reviewed
37) 2023.01 T-mu phase diagram using classical-quantum hybrid algorithm, PoS LATTICE2022, 039 (2023), doi:10.22323/1.430.0039, single-authored, peer-reviewed
38) 2023.06 Self-learning Monte Carlo with equivariant Transformer, J.Phys.Soc.Jap. 93 (2023), doi:10.7566/JPSJ.93.114007, arXiv:2306.11527, co-authored, peer-reviewed
39) 2023.10 Equivariant transformer is all you need, PoS LATTICE2023, 001 (2023), doi:10.22323/1.453.0001, arXiv:2310.13222, co-authored, peer-reviewed
40) 2023.11 Sparse modeling approach to extract spectral functions with covariance of Euclidean-time correlators of lattice QCD, PoS LATTICE2023, 028 (2023), doi:10.22323/1.453.0028, arXiv:2311.15233, co-authored, peer-reviewed
41) 2024.03 Impact of a local CP-odd domain in hot QCD on the axionic domain-wall interpretation of NANOGrav 15-year data, Phys.Rev.D 109 (2024), doi:10.1103/PhysRevD.109.115015, arXiv:2403.11444, co-authored, peer-reviewed
42) 2024.10 Implications of the electromagnetic scale anomaly to the QCD chiral phase transition in the smaller quark mass regime: Tpc does not drop with eB, Phys.Rev.D 111 (2024), doi:10.1103/zzd7-86cm, arXiv:2410.11360, co-authored, peer-reviewed
43) 2024.10 Sparse modeling study to extract spectral functions from lattice QCD data, PoS LATTICE2024, 032 (2024), doi:10.22323/1.466.0032, arXiv:2410.23567, co-authored, peer-reviewed
44) 2024.11 Functional renormalization group study of a four-fermion model with CP violation, Phys.Rev.D 111, 7 (2024), doi:10.1103/PhysRevD.111.074015, arXiv:2411.07027, co-authored, peer-reviewed
45) 2024.11 Lattice gradient flows (de-)stabilizing topological sectors, JHEP 04, 123 (2024), doi:10.1007/JHEP04(2025)123, arXiv:2411.14812, co-authored, peer-reviewed
46) 2024.11 Machine Learning Estimation on the trace of inverse Dirac operator using the Gradient Boosting Decision Tree Regression, PoS LATTICE2024, 033 (2024), doi:10.22323/1.466.0033, arXiv:2411.18170, co-authored, peer-reviewed
47) 2025 Machine Learning for Lattice QCD, J.Phys.Soc.Jap. 94 (2025), doi:10.7566/JPSJ.94.031006, single-authored, peer-reviewed
48) 2025.01 CASK: A Gauge Covariant Transformer for Lattice Gauge Theory, PoS LATTICE2024, 030 (2025), doi:10.22323/1.466.0030, arXiv:2501.16955, co-authored, peer-reviewed
49) 2025.02 First-order CP phase transition in two-flavor QCD at $\theta=\pi$ under electromagnetic scale anomaly via a Nambu–Jona-Lasinio description, Phys.Rev.D 111 (2025), doi:10.1103/PhysRevD.111.074028, arXiv:2502.03879, co-authored, peer-reviewed

50) 2025.07 Axionlike particle-assisted supercooling chiral phase transition in QCD: identifying Coleman-Weinberg type-chiral phase transition in QCD-like scenarios, JHEP 03, 062 (2025), doi:10.1007/JHEP03(2026)062, arXiv:2507.18016, co-authored, peer-reviewed
51) 2025.08 Columbia plot based on the symmetry-improved Cornwall-Jackiw-Tomboulis formalism in the linear sigma model, Phys.Rev.D 113 (2025), doi:10.1103/71r7-8b3p, arXiv:2508.02257, co-authored, peer-reviewed
52) 2025.09 Sparse modeling study of extracting charmonium spectral functions from lattice QCD at finite temperature, Phys.Rev.D 113 (2025), doi:10.1103/cdjf-65yf, arXiv:2509.10386, co-authored, peer-reviewed
53) 2026.02 Machine Learning-Based Estimation of Cumulants of Chiral Condensate via Multi-Ensemble Reweighting with Deborah.jl, PoS LATTICE2025, 054 (2026), doi:10.22323/1.518.0054, arXiv:2602.21617, co-authored, peer-reviewed
54) 2026.02 A Machine Learning Approach for Lattice Gauge Fixing, PoS LATTICE2025, 041 (2026), doi:10.22323/1.518.0041, arXiv:2602.23731, co-authored, peer-reviewed
55) 2026.03 Parameter Optimization of Domain-Wall Fermion using Machine Learning, PoS LATTICE2025, 035 (2026), doi:10.22323/1.518.0035, arXiv:2603.16329, co-authored, peer-reviewed
56) 2015.08 Effective lattice action for the configurations smeared by the Wilson flow, arXiv:1508.04986, co-authored, not peer-reviewed (preprint)
57) 2017.03 (De)Constructing magnetized dimensions, arXiv:1703.05263, co-authored, not peer-reviewed (preprint)
58) 2017.12 Towards reduction of autocorrelation in HMC by machine learning, arXiv:1712.03893, co-authored, not peer-reviewed (preprint)
59) 2022.04 Extensively parallelizable chiral fermion, arXiv:2204.01583, co-authored, not peer-reviewed (preprint)
60) 2022.05 Schwinger model at finite temperature and density with beta VQE, arXiv:2205.08860, single-authored, not peer-reviewed (preprint)
61) 2022.08 GomalizingFlow.jl: A Julia package for Flow-based sampling algorithm for lattice field theory, arXiv:2208.08903, co-authored, not peer-reviewed (preprint)
62) 2024.09 JuliaQCD: Portable lattice QCD package in Julia language, arXiv:2409.03030, co-authored, not peer-reviewed (preprint)
63) 2026.02 Lattice Gauge Theory via LLVM-Level Automatic Differentiation, arXiv:2602.20516, co-authored, not peer-reviewed (preprint)
64) 2026.05 Thermodynamics in symmetry-improved Cornwall-Jackiw-Tomboulis formalism: application to the low-energy effective theory of QCD, arXiv:2605.29701, co-authored, not peer-reviewed (preprint)
65) 2026.06 Numerical Hints for Dyon Condensation at θ=2π via Wilson-'t Hooft Loops in SU(2) Yang-Mills Theory, arXiv:2606.13428, co-authored, not peer-reviewed (preprint)
66) 2026.07 Lattice Configuration Generation with a Self-Learning Diffusion Model, arXiv:2607.12587, single-authored, not peer-reviewed (preprint)
(2) Presentations
1) 2010.12 International Workshop on Theoretical Particle Physics 2010, "Seesaw Mechanism and Large Mixing"
2) 2011.08 Summer Institute for Young Particle Theorists, "Recent status of Walking technicolor"
3) 2011.11 International Workshop on Theoretical Particle Physics 2011, "Lattice study of minimal walking technicolor"
4) 2012 The 2nd OU-RuG Symposium on Particle-Nuclear and Condensed Matter Physics, Osaka University, Osaka, Japan, "Low Energy Behavior of Eigenvalue Distribution Nf=12 QCD" (poster)
5) 2012 Summer school for students in high energy physics, Fuji Yoshida, Japan, "Phase structure of lattice gauge theories with staggered fermions" (poster)
6) 2012.06 KANSAI local seminar, Kyoto University, "On realization for minimal walking technicolor"
7) 2012.09 International Workshop on Theoretical Particle Physics 2012, "The Phase Structure of Lattice Gauge Theory"
8) 2013.07 ILC accelerator and physics / detectors 2013 Summer School, "Walking technicolor and lattice gauge theory"
9) 2013.11 International Workshop on Theoretical Particle Physics 2013, "A study of U(1)A Anomaly at Finite Temperature"
10) 2014.04 JPS Annual Meeting, The Physical Society of Japan, "U(1) axial anomaly at finite temperature with chiral fermions"

11) 2014.06 LATTICE 2014, "Effects of near-zero Dirac eigenmodes on axial U(1) symmetry at finite temperature"
12) 2014.07 PPP2014, Yukawa Institute for Theoretical Physics, Kyoto University, "U(1) axial anomaly at finite temperature with generalized domain-wall fermions"
13) 2014.08 Summer school for students in high energy physics, Nagano, Japan, "U(1) axial anomaly at finite temperature" (poster)
14) 2014.08 ATHIC 2014, "Effects of near-zero Dirac eigenmodes on axial U(1) symmetry at finite temperature"
15) 2014.09 JPS Annual Meeting, The Physical Society of Japan, "U(1) axial anomaly at finite temperature with generalized domain-wall fermions"
16) 2014.12 Kyushu University, "U(1) axial anomaly at finite temperature QCD with chiral fermions"
17) 2015.02 Central China Normal University, "Evidence of effective axial U(1) symmetry restoration at high temperature QCD"
18) 2015.05 Niigata University, "Evidence of effective axial U(1) symmetry restoration at high temperature QCD"
19) 2015.07 LATTICE 2015, "On the axial U(1) symmetry at finite temperature"
20) 2016 Extreme QCD, CCNU, Wuhan, China, "U(1)A symmetry restoration in two-flavor QCD at finite temperature with chiral fermions" (poster)
21) 2016.12 IOPP Young-Star 2016, "Phase Transitions"
22) 2017.02 QCD in Finite Temperature and Heavy-Ion Collisions, Brookhaven National Laboratory, "Evidence of effective axial U(1) symmetry restoration at high temperature QCD"
23) 2017.02 Brookhaven National Laboratory, "The Kibble-Zurek scaling for the Entanglement Entropy on the scalar field in 1+1 dimension"
24) 2017.03 JPS Annual Meeting, The Physical Society of Japan, "QCD phase transition under external magnetic field with staggered fermions"
25) 2017.06 LATTICE 2017, "Chiral phase transition of three flavor QCD with nonzero magnetic field"
26) 2017.06 ExtremeQCD, "Chiral phase transition of three flavor QCD with nonzero magnetic field"
27) 2017.07 RIKEN, "(De)Constructing magnetized dimensions"
28) 2017.07 Ochanomizu University, "Evidence of effective axial U(1) symmetry restoration at high temperature QCD"
29) 2017.08 University of Tsukuba, "Detection of phase transition via convolutional neural networks"
30) 2018.02 Nuclear Theory Group, Osaka University, "Towards reduction of autocorrelation in HMC by machine learning"
31) 2018.03 JPS Annual Meeting, The Physical Society of Japan, "QCD phase transition under external magnetic field with improved staggered fermions"
32) 2018.03 Nuclear Theory Group, Osaka University, "A lecture on the multipoint reweighting"
33) 2018.05 Korea Institute for Advanced Study, intensive lecture, "Introduction to Machine Learning"
34) 2018.07 LATTICE 2018, "Phase structure of three flavor QCD in external magnetic fields using HISQ fermions"
35) 2018.08 Central China Normal University, "Phase structure of three flavor QCD in external magnetic fields"
36) 2018.10 Bielefeld University, "Towards reduction of autocorrelation in HMC by machine learning"
37) 2018.10 Regensburg University, "Detection of phase transition via convolutional neural networks"
38) 2018.10 Eötvös Loránd University, "Phase structure of three flavor QCD in external magnetic fields using HISQ actions"
39) 2018.11 University of Tsukuba, "Phase structure of three flavor QCD in external magnetic fields using HISQ actions"
40) 2018.12 RIKEN, "Deep Learning and Holographic QCD"
41) 2019.01 Japan Agency for Marine-Earth Science and Technology (JAMSTEC), "An introduction to deep learning"
42) 2019.03 JPS Annual Meeting, The Physical Society of Japan, "Phase structure of three flavor QCD in external magnetic fields"
43) 2019.03 RBRC Scientific Review Committee Meeting, "Phase structure of three flavor QCD in external magnetic fields"
44) 2019.03 RIKEN Center for Computational Science, "Towards reduction of autocorrelation in HMC by machine learning"
45) 2019.05 Brookhaven National Laboratory, "Applications of machine learning to computational physics"
46) 2019.06 XQCD 2019, "Phase structure of three flavor QCD in external magnetic fields"

47) 2019.06 Lattice 2019, "Phase structure of three flavor QCD in external magnetic fields"
48) 2019.07 Keio University, "Phase transition in three flavor QCD with background magnetic field"
49) 2019.09 Jilin University, "Phase transition in three flavor QCD with background magnetic field"
50) 2019.11 International Workshop on Theoretical Particle Physics 2019, "Chiral condensate in Schwinger model by quantum computer"
51) 2019.11 HPC-Phys working group, Waseda University, "An introduction to deep learning"
52) 2019.11 Jilin University, "An introduction to lattice gauge theories"
53) 2019.12 Kochi University of Technology, "An introduction to Machine learning and science"
54) 2019.12 Kochi University of Technology, "An introduction to deep learning"
55) 2019.12 Math club, "An introduction to lattice gauge theories"
56) 2020.03 A.I. for nuclear physics, "Applications of machine learning to computational physics" (invited)
57) 2020.03 J-PARC, "Applications of machine learning for theoretical physics"
58) 2020.04 APS April Meeting, "Self-learning Monte-Carlo for non-abelian gauge theory with dynamical fermions"
59) 2020.04 RIKEN Center for Computational Science, "Gauge covariant neural network for 4 dimensional non-abelian gauge theory"
60) 2020.04 MIT, "Gauge covariant neural network for 4 dimensional non-abelian gauge theory"
61) 2020.05 Osaka University, "Lattice gauge theory with quantum computers"
62) 2020.05 Ochanomizu University, "Applications of machine learning on theoretical physics"
63) 2020.06 RIKEN Center for Computational Science, "Lattice gauge theory with quantum computers"
64) 2020.08 Asia-Pacific Symposium for Lattice Field Theory (APLAT 2020), "Thermal field theory with pure states"
65) 2020.09 Progress of particle physics 2020, "Machine learning and theoretical physics" (invited)
66) 2020.10 Shimane University, "Applications of machine learning on theoretical physics"
67) 2020.10 Kickoff meeting of C2QA center, Brookhaven National Laboratory, "Quantum computing for QCD phase diagram? Finite chemical potential and temperature?"
68) 2020.11 DLAP 2020 lecture, Osaka University, "A lecture on usage of neural nets in physics"
69) 2020.12 The 5th Symposium on Statistical Machine Learning, "Machine learning for physics" (invited)
70) 2020.12 YITP Seminar, Yukawa Institute for Theoretical Physics, Kyoto University, "Self-learning Monte-Carlo for non-abelian gauge theory with dynamical fermions"
71) 2021.03 JPS Annual Meeting, The Physical Society of Japan, "Self-learning Monte-Carlo for QCD"
72) 2021.04 Deep learning and physics, "Gauge covariant neural network for 4 dimensional non-abelian gauge theory"
73) 2021.05 MITP Seminar, "Gauge covariant neural network for 4 dimensional non-abelian gauge theory"
74) 2021.07 LATTICE2021@MIT (Virtual), "Lattice QCD code with Julia" (poster)
75) 2021.07 LATTICE2021@MIT (Virtual), "Machine Learning Approximated Nucleon Matrix Elements with Domain Wall Fermions" (poster)
76) 2021.07 National Institute of Radiological Sciences (QST), "Machine Learning and Theoretical Physics"
77) 2021.07 National Institute of Radiological Sciences (QST), "Toward Cost Reduction in Lattice Computation Using Machine Learning"
78) 2021.07 JuliaCon 2021, "LatticeQCD.jl: Simulation of quantum gauge fields"
79) 2021.07 "LatticeQCD.jl: Simulation of quantum gauge fields"
80) 2021.07 LATTICE2021, "Smearing is a neural network"
81) 2021.08 Confinement and hadron spectrum, "Machine learning for Lattice QCD"
82) 2021.08 "Machine learning for Lattice QCD"
83) 2021.09 Julia in Physics, "Start Lattice QCD.jl with Lattice QCD." (invited)
84) 2021.11 Fujii group seminar, "Seminar at the Fujii group"
85) 2021.12 DWQ25, New York, USA, "Gauge covariant neural network and full QCD simulation"
86) 2022.03 Symposium talk, The 77th JPS Annual Meeting, The Physical Society of Japan, "Accelerating lattice QCD by physics-inspired machine learning"
87) 2022.06 The Institute of Statistical Mathematics, "Accelerating lattice field theory with machine learning"
88) 2022.06 Institute of Physics, National Chiao-Tung University, Taiwan, "Schwinger model at finite temperature and density with classical-quantum hybrid algorithm"

89) 2022.08 Massachusetts Institute of Technology, "T-mu phase diagram using classical-quantum hybrid algorithm"
90) 2022.08 Brookhaven National Laboratory, "T-mu phase diagram using classical-quantum hybrid algorithm"
91) 2022.09 MLPhys Kick-off Meeting, Kyoto University, "machine learning and lattice QCD"
92) 2022.09 JPS Annual Meeting, The Physical Society of Japan, "Search for phase diagram of Schwinger model using Quantum-Classical Hybrid Algorithm"
93) 2022.09 Nonperturbative Analysis of Quantum Field Theory and its Applications, "Neural net for lattice QCD, and quantum methods for finite-temperature and density"
94) 2022.11 Computational Mechanics Conference, The Japan Society of Mechanical Engineers, "Recent progress in the Application of Deep Learning to Physics"
95) 2022.12 Machine Learning and the Physical Sciences Workshop at NeurIPS 2022, "Combinational-convolution for flow-based sampling algorithm" (poster)
96) 2022.12 Symposium on "Elementary Particles, Nuclei, Universe and Planets Accelerated at Fugaku", RIKEN, "Machine Learning for Accelerating Lattice QCD Computations"
97) 2022.12 The University of Tokyo, "Lattice QCD with Machine learning"
98) 2023.01 RBRC Scientific Review Committee (SRC) Meeting, Brookhaven National Laboratory, "Lattice QCD with Machine learning"
99) 2023.02 Challenges and opportunities in Lattice QCD simulations and related fields, "Machine learning and Lattice QCD"
100) 2023.03 Symposium, JPS Meeting, The Physical Society of Japan, "Advances in Lattice QCD with Machine Learning" (invited)
101) 2023.03 HPCI Computational Science Forum, Virtual, "Development of machine learning methods for simulation of quantum theory of lattice fields"
102) 2023.05 Exploring GPT's Influence on Natural Science and Mathematics, RIKEN, "Use of GPT"
103) 2023.06 The Future is non-perturbative, "Flow based sampling for 3- and 4-dim. model" (invited)
104) 2023.06 Julia in mathematics and physics, Kyushu University, "Application of Julia in Particle Physics -Toward Large-Scale Computations of Lattice QCD-"
105) 2023.06 Kick-off Meeting of the Program for Promoting Researches on the Supercomputer Fugaku, Keio University, "Self-learning Monte Carlo"
106) 2023.06 University of Tsukuba, "An introduction to machine learning for physicists"
107) 2023.07 Intensive lecture, Kanazawa University, "An introduction to machine learning for physicists"
108) 2023.07 Seminar, Kanazawa University, "Equivariant transformer is all you need"
109) 2023.10 CCS International Symposium 2023, "Integrating Machine Learning into Lattice QCD" (invited)
110) 2024 Confinement 2024, "Machine Learning Methods in Lattice QCD" (invited)
111) 2024 German-Japan Seminar, "Machine learning in lattice gauge theory" (invited)
112) 2024.01 "Welcome to the world of AI, Part 1: What is AI, after all?"
113) 2024.07 Lattice2024, Liverpool, UK, "Developments of CASK: Gauge Symmetric Transformer"
114) 2024.07 ML meets LFT, Swansea, UK, "MLPhys in Japan and Developments of CASK: Gauge Symmetric Transformer" (invited)
115) 2024.09 Lattice summer school 2024, Tokyo, Japan, "Hands-on for lattice QCD"
116) 2024.09 Analytical Mechanics Mini-workshop, Tokyo, Japan, "Symplectic integrators in lattice QCD"
117) 2024.11 TWCU Faculty Union Sponsored Event: Exploring the Charms of Tokyo Women's University, Tokyo, Japan, "Why AI study got Nobel prize?" (invited)
118) 2024.12 Lattice Field Theory and Machine Learning, Taipei, Taiwan, "Gauge Covariant Transformer" (invited)
119) 2024.12 Julia in physics 2024, Tokyo, Japan, "Lattice QCD with Julia"
120) 2025 "Lattice gradient flows (de-)stabilizing topological sectors for SU(3)"
121) 2025.01 Symposium of Basic Science Research Programs on the Fugaku supercomputer, Tokyo, Japan, "Gauge covariant Transformer"
122) 2025.02 Kyoto U and TWCU joint workshop 2025, Kyoto, Japan, "Application of AI technologies on lattice QCD"
123) 2025.02 The 4th Research Workshop of Program for Promoting Research on the Supercomputer Fugaku, Tokyo, Japan, "Transformer for lattice QCD"
124) 2025.02 Fugaku FY2024 poster session, "Summary of the development of transformers for lattice QCD" (poster)

125) 2025.03 Cambridge University, "CASK: A Gauge Covariant Transformer for Lattice Gauge Theory"
126) 2025.03 LIMS, "CASK: A Gauge Covariant Transformer for Lattice Gauge Theory"
127) 2025.06 HPNP 2025, "Symmetric mass generation"
128) 2025.06 Symposium, Kyoto University, "Generation of physical configurations in computational physics"
129) 2025.07 JuliaHEP, "JuliaQCD: Portable lattice QCD package in Julia"
130) 2025.07 JuliaCon, "JuliaQCD: Portable lattice QCD package in Julia language"
131) 2025.08 IAIFI international workshop, "A Transformer with Gauge-Covariant Attention for Lattice QCD"
132) 2026.01 The 2nd AI+HEP in East Asia workshop, "Machine Learning for Lattice QCD" (invited)
133) 2026.03 FY2025 JST BOOST Young Researchers Meeting, Miraikan (National Museum of Emerging Science and Innovation), Tokyo, "Machine learning methods for quantum field theory" (poster)
134) 2026.03 The 41st Online Physics Lecture, The Physical Society of Japan, "Physics for AI, AI for physics" (invited)
135) 2026.06 Kick-off Workshop of the Research Center for Generative Science, "Generative computational physics"
136) 2026.06 Online lecture on AI, Akita Prefectural Odate Homei High School, "How ChatGPT works" (invited)
137) 2026.06 Generative Science Workshop 2026, "Reliable theoretical predictions and exploration of new physics with generative computational physics"
138) 2026.06 The 43rd Regular Meeting of the New Higgs Working Group (NHWG43), "When ALPs Meet the QCD Phase Transition" (invited)
139) 2026.06 Particle Physics and Cosmology Theory Seminar, Kobe University, "Introduction to Lattice Gauge Theory and Numerical Experiments for Strong-Interaction Physics with JuliaQCD" (invited)
140) 2026.07 XVII Conference on Quark Confinement and the Hadron Spectrum (QCHS 2026), "Machine Learning for Strong-Interaction Physics" (invited)
141) 2026.07 Lattice@CERN 2026, "Machine Learning Methods for Lattice QCD" (invited)
142) 2026.07 International Conference on Machine Learning Physics 2026 (IC-MLPhys 2026), "Computational physics with ML: Summary of A01 and related works" (invited)
143) 2026.07 P²EAK 2026 (Particle-Physics Endeavor Across Kyushu), "An introduction to lattice QCD with and without AI" (invited)
144) 2026.07 The 43rd International Symposium on Lattice Field Theory (Lattice 2026), "Gradient-Flow Actions, Integerness, and Gluonic-Fermionic Topology Matching in SU(3) Yang-Mills Theory"
145) 2026.08 JuliaCon Global 2026, "VisualizingLQCD.jl: Visualization of quantum vacuum"
146) 2026.08 Theoretical Physics Seminar, Bielefeld University, "Topology under Gradient Flow: Finite-a readout, fermionic matching, and continuum universality" (invited)
147) 2026.08 Jilin University, Changchun, China, "An Introduction to Lattice QCD" (invited)
148) 2026.08 Jilin University seminar, "A Better Way to Determine Topological Charge" (invited)
149) 2026.09 Bridging machine learning and statistical field theory through generative and diffusion processes, "Self-learning Diffusion model and recent developments" (invited)
150) 2026.09 Theoretical Physics Seminar, University of Bern, "Topology under Gradient Flow: Flow-action dependence, fermionic matching, and continuum universality" (invited)
151) 2026.09 Intensive lecture course (7 sessions), Niigata University, "Machine learning and physics" (invited)
152) 2026.09 Physics Colloquium, Niigata University, "How will generative AI change physics? Configuration generation and lattice field theory as examples" (invited)
153) 2026.10 Physics Seminar, Tokyo Woman's Christian University, "Probing the Mysteries of Quantum Fields with AI and Supercomputers: Lattice QCD and Machine Learning" (invited)
154) 2026.11 New Frontiers in QCD 2026 (NFQCD 2026), 4th week: Dense QCD Matter and Compact Stars, "Toward the Low-Temperature Finite-Density Phase Diagram of Two-Flavor G2-QCD"
155) 2026.11 Sophia Symposium: Coevolution of AI and Physics (SSCAIP 2026), "Self-learning diffusion models for Monte Carlo sampling" (invited)

(3) Books

1) A. Tanaka, A. Tomiya, K. Hashimoto, Deep Learning and Physics: Principles and Applications (in Japanese), Kodansha, 2019 (ISBN: 9784065162620).
2) K. Hashimoto et al. (17 authors including A. Tomiya), Physicists Use Machine Learning: Applications of Machine Learning and Deep Learning to Physics (in Japanese), Asakura Publishing, October 2019 (ISBN: 9784254131291).

3) A. Tomiya, Introduction to Machine Learning (in Japanese), Kodansha, March 2021 (ISBN: 9784065225493).
4) Parity Editorial Committee (ed.), Physical Sciences: This Year 2022 (in Japanese), Maruzen Publishing, January 2022, contributed chapter "Quantum computers and particle physics" (ISBN: 9784621306864).
5) K. Hashimoto, A. Tomiya, R. Kaneko, M. Taki, Y. Hirono, R. Karakida, A. Sannai, Introduction to Machine Learning Physics (in Japanese), Asakura Publishing, November 2024 (ISBN: 9784254131529).
6) K. Hashimoto, A. Tomiya, R. Kaneko, M. Taki, Y. Hirono, R. Karakida, A. Sannai, Introduction to Machine Learning Physics (English edition), Asakura Publishing, October 2025 (ISBN: 9784254131543).
7) K. Kashiwa, H. Ohno, A. Tomiya, Introduction to Lattice Field Theory (in Japanese), Morikita Publishing, August 2025 (ISBN: 9784627171015).

12. Academic Societies

The Physical Society of Japan

13. Awards

May 2025, HPCI Software Award 2025, Excellence Award (Development Category), for JuliaQCD, HPCI Consortium
November 2024, JPSJ Editors' Choice, "Self-learning Monte Carlo with equivariant Transformer", Journal of the Physical Society of Japan
January 2024, The 29th (2024) Outstanding Paper Award of the Physical Society of Japan, "Detection of Phase Transition via Convolutional Neural Networks"
January 2021, Excellent Presentation Award, FY2020 RIKEN Special Postdoctoral Researchers Research Achievement Presentation Meeting
June 2019, Young Scientist Award in Theoretical Particle Physics, "Detection of Phase Transition via Convolutional Neural Networks", Committee for Theoretical Particle Physics (FY2019)
April 2019, Most Cited Articles in 2018 from Vol. 86 (2017), "Detection of Phase Transition via Convolutional Neural Networks", Journal of the Physical Society of Japan
August 2014, Poster Presentation Award, "Effective restoration of the axial U(1) symmetry at finite temperature", Summer School for Young Researchers in Nuclear and Hadron Physics