

# Yi-Zhuang You, Ph. D.



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## Summary

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**Yi-Zhuang You** is an Associate Professor of Physics at the University of California, San Diego. His research lies at the intersection of quantum many-body physics, quantum information science, and machine learning. He is known for pioneering work on symmetric mass generation, entanglement dynamics in quantum circuits, and AI-assisted quantum state learning. Recent efforts focus on developing machine learning algorithms for quantum error correction, quantum tomography, and representation learning of quantum systems. He is a recipient of the NSF CAREER Award and UC Hellman Fellowship, and he serves on the editorial board of *Machine Learning: Science and Technology*.

## Work Experience

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2024 - present	<b>Associate Professor</b> University of California, San Diego, CA
2018 - 2024	<b>Assistant Professor</b> University of California, San Diego, CA

## Education and Training

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2004 - 2008	<b>B. Sc. Physics</b> Nanjing University, Nanjing, China
2008 - 2013	<b>Ph. D. Physics</b> Tsinghua University, Beijing, China
2013 - 2016	<b>Postdoctoral Researcher</b> University of California, Santa Barbara, CA
2016 - 2018	<b>Postdoctoral Researcher</b> Harvard University, Cambridge, MA

## Awards and Honors

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- National Science Foundation, CAREER award (2022)

- University of California Hellman Fellow (2021)
- National Scholarship for Graduate Students – China (2012)
- Graduate Scholarship – Tsinghua University (2010)
- C.N. Yang Fellowship – Tsinghua University (2009)
- Honor Graduate – Nanjing University (2008)

## Professional Activities

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- Editorial Board Member for IOP Science journal *Machine Learning: Science and Technology* (MLST), (2019 - now).
- Referee for Nature Physics, APS Journals (Physical Review Letters, Physical Review X, Physical Review B), American Journal of Physics, and Chinese Physics Letters.
- Co-organizer of *Symmetric Mass Generation, Topological Phases and Lattice Chiral Gauge Theories*, Simons Center for Geometry and Physics, New York, May 20-24 (2024).
- Co-organizer of *The First International Conference on Machine Learning and Physics*, Tsinghua University, Beijing, July 4-6 (2018).
- Co-organizer of *Artificial Intelligence and Quantum Physics workshop*, Nanjing University, Nanjing, December 20-22 (2017).
- Co-organizer of *Topological States and Phase Transitions in Strongly Correlated Systems*, Kavli Institute for Theoretical Science, Beijing, July 3-14 (2017).

## Publications

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### Articles:

1. Wanda Hou, Miao Li, Yi-Zhuang You. *Sequential learning on a Tensor Network Born machine with Trainable Token Embedding*. Machine Learning: Science and Technology (2025).
2. Menghan Song, Zhaoyi Zeng, Ting-Tung Wang, Yi-Zhuang You, Zi Yang Meng, Pengfei Zhang. *Monte Carlo Simulation of Operator Dynamics and Entanglement in Dual-Unitary Circuits*. Quantum **9**, 1681 (2025).
3. Hong-Ye Hu, Andi Gu, Swarnadeep Majumder, Hang Ren, Yipei Zhang, Derek S Wang, Yi-Zhuang You, Zlatko Mineev, Susanne F Yelin, Alireza Seif. *Demonstration of robust and efficient quantum property learning with shallow shadows*. Nature Communications **16** (1), 2943 (2025).
4. Shuhan Zhang, Xiaozhou Feng, Matteo Ippoliti, Yi-Zhuang You. *Holographic classical shadow tomography*. Physical Review B **111** (5), 054306 (2025).
5. Ruyi Tao, Ningning Tao, Yi-zhuang You, Jiang Zhang. *Data driven modeling for self-similar dynamics*. Physica D: Nonlinear Phenomena **472**, 134505 (2025).
6. Jong Yeon Lee, Yi-Zhuang You, Cenke Xu. *Symmetry protected topological phases under decoherence*. Quantum **9**, 1607 (2025).
7. Artan Sheshmani, Yi-Zhuang You, Baturalp Buyukates, Amir Ziashahabi, Salman Avestimehr. *Renormalization group flow, optimal transport, and diffusion-based generative model*. Physical Review E **111** (1), 015304 (2025).
8. Da-Chuan Lu, Zhengdi Sun, Yi-Zhuang You. *Realizing triality and p-ality by lattice twisted gauging in (1+1)d quantum spin systems*. SciPost Physics **17** (5), 136 (2024).
9. Jia-Xin Zhang, Hao-Kai Zhang, Yi-Zhuang You, Zheng-Yu Weng. *Strong Pairing Originated from an Emergent Z<sub>2</sub> Berry Phase in La<sub>3</sub>Ni<sub>2</sub>O<sub>7</sub>*. Physical Review Letters **133** (12), 126501 (2024).

10. Amir Ziashahabi, Baturalp Buyukates, Artan Sheshmani, Yi-Zhuang You, Salman Avestimehr. *Frequency Domain Diffusion Model with Scale-Dependent Noise Schedule*. 2024 IEEE International Symposium on Information Theory (ISIT), 19-24 (2024).
11. Zi Hong Liu, Yuan Da Liao, Gaopei Pan, Menghan Song, Jiarui Zhao, Weilun Jiang, Chao-Ming Jian, Yi-Zhuang You, Fakher F Assaad, Zi Yang Meng, Cenke Xu. *Disorder operator and Rényi entanglement entropy of symmetric mass generation*. Physical Review Letters **132** (15), 156503 (2024).
12. Zhelun Zhang, Yi-Zhuang You. *Observing Schrödinger's cat with artificial intelligence: emergent classicality from information bottleneck*. Machine Learning: Science and Technology **5** (1), 015051 (2024).
13. Meng Zeng, Lun-Hui Hu, Hong-Ye Hu, Yi-Zhuang You, Congjun Wu. *High-order time-reversal symmetry breaking normal state*. Science China Physics, Mechanics & Astronomy **67** (3), 237411 (2024).
14. Ahmed A Akhtar, Hong-Ye Hu, Yi-Zhuang You. *Measurement-induced criticality is tomographically optimal*. Physical Review B **109** (9), 094209 (2024).
15. Xiaoyang Huang, Taige Wang, Shang Liu, Hong-Ye Hu, Yi-Zhuang You. *Quantum magnetism in Wannier-obstructed Mott insulators*. Crystals **14** (2), 176 (2024).
16. Da-Chuan Lu, Juven Wang, Yi-Zhuang You. *Definition and classification of Fermi surface anomalies*. Physical Review B **109** (4), 045123 (2024).
17. Taige Wang, Chen Wu, Masataka Mogi, Minoru Kawamura, Yoshinori Tokura, Zhi-Xun Shen, Yi-Zhuang You, Monica T Allen. *Probing the edge states of Chern insulators using microwave impedance microscopy*. Physical Review B **108** (23), 235432 (2023).
18. Da-Chuan Lu, Meng Zeng, Yi-Zhuang You. *Green's function zeros in Fermi surface symmetric mass generation*. Physical Review B **108** (20), 205117 (2023).
19. Wanda Hou, Yi-Zhuang You. *Machine learning renormalization group for statistical physics*. Machine Learning: Science and Technology **4** (4), 045010 (2023).
20. Yuxuan Guo, Yi-Zhuang You. *Symmetric mass generation of Kähler-Dirac fermions from the perspective of symmetry-protected topological phases*. Physical Review B **108** (11), 115139 (2023).
21. Wanda Hou, Yi-Zhuang You. *Variational Monte Carlo study of symmetric mass generation in a bilayer honeycomb lattice model*. Physical Review B **108** (12), 125130 (2023).
22. Weitang Liu, Yi-Zhuang You, Ying Wai Li, Jingbo Shang. *Gradient-based wang-landau algorithm: A novel sampler for output distribution of neural networks over the input space*. International Conference on Machine Learning, 22338-22351 (2023).
23. Ahmed A Akhtar, Hong-Ye Hu, Yi-Zhuang You. *Scalable and flexible classical shadow tomography with tensor networks*. Quantum **7**, 1026 (2023).
24. Da-Chuan Lu, Meng Zeng, Juven Wang, Yi-Zhuang You. *Fermi surface symmetric mass generation*. Physical Review B **107** (19), 195133 (2023).
25. Hong-Ye Hu, Soonwon Choi, Yi-Zhuang You. *Classical shadow tomography with locally scrambled quantum dynamics*. Physical Review Research **5** (2), 023027 (2023).
26. Artan Sheshmani, Yi-Zhuang You, Wenbo Fu, Ahmadreza Azizi. *Categorical representation learning and RG flow operators for algorithmic classifiers*. Machine Learning: Science and Technology **4** (1), 015012 (2023).
27. Da-Chuan Lu, Taige Wang, Shubhayu Chatterjee, Yi-Zhuang You. *Correlated metals and unconventional superconductivity in rhombohedral trilayer graphene: A renormalization group analysis*. Physical Review B **106** (15), 155115 (2022).
28. Juven Wang, Zheyang Wan, Yi-Zhuang You. *Cobordism and deformation class of the standard model*. Physical Review D **106** (4), L041701 (2022).

29. Hong-Ye Hu, Dian Wu, Yi-Zhuang You, Bruno Olshausen, Yubei Chen. *RG-Flow: A hierarchical and explainable flow model based on renormalization group and sparse prior*. Machine Learning: Science and Technology **3** (3), 035009 (2022).
30. Juven Wang, Zheyang Wan, Yi-Zhuang You. *Proton stability: From the standard model to beyond grand unification*. Physical Review D **106** (2), 025016 (2022).
31. Juven Wang, Yi-Zhuang You. *Gauge enhanced quantum criticality beyond the standard model*. Physical Review D **106** (2), 025013 (2022).
32. Juven Wang, Yi-Zhuang You. *Symmetric mass generation*. Symmetry **14** (7), 1475 (2022).
33. Meng Zeng, Zheng Zhu, Juven Wang, Yi-Zhuang You. *Symmetric Mass Generation in the 1+1 Dimensional Chiral Fermion 3-4-5-0 Model*. Physical Review Letters **128** (18), 185301 (2022).
34. Yi-Zhuang You, Ashvin Vishwanath. *Kohn-Luttinger superconductivity and intervalley coherence in rhombohedral trilayer graphene*. Physical Review B **105** (13), 134524 (2022).
35. Bo Xiang, Zimo Yang, Yi-Zhuang You, Wei Xiong. *Ultrafast coherence delocalization in real space simulated by polaritons*. Advanced Optical Materials **10** (5), 2102237 (2022).
36. Yi-Zhuang You, Juven Wang. *Deconfined quantum criticality among grand unified theories*. A Festschrift in Honor of the CN Yang Centenary: Scientific Papers, 367-383 (2022).
37. Hong-Ye Hu, Yi-Zhuang You. *Hamiltonian-driven shadow tomography of quantum states*. Physical Review Research **4** (1), 013054 (2022).
38. Artan Sheshmani, Yi-Zhuang You. *Categorical representation learning: morphism is all you need*. Machine Learning: Science and Technology **3** (1), 015016 (2021).
39. Jonathan Lam, Yi-Zhuang You. *Machine learning statistical gravity from multi-region entanglement entropy*. Physical Review Research **3** (4), 043199 (2021).
40. Da-Chuan Lu, Cenke Xu, Yi-Zhuang You. *Self-duality protected multicriticality in deconfined quantum phase transitions*. Physical Review B **104** (20), 205142 (2021).
41. Wei-Ting Kuo, Daniel P Arovas, Smitha Vishveshwara, Yi-Zhuang You. *Decoherent quench dynamics across quantum phase transitions*. SciPost Physics **11** (4), 084 (2021).
42. Nathan J McLaughlin, Hailong Wang, Mengqi Huang, Eric Lee-Wong, Lunhui Hu, Hanyi Lu, Gerald Q Yan, Genda Gu, Congjun Wu, Yi-Zhuang You, Chunhui Rita Du. *Strong correlation between superconductivity and ferromagnetism in an Fe-chalcogenide superconductor*. Nano Letters **21** (17), 7277-7283 (2021).
43. Koji Hashimoto, Hong-Ye Hu, Yi-Zhuang You. *Neural ordinary differential equation and holographic quantum chromodynamics*. Machine Learning: Science and Technology **2** (3), 035011 (2021).
44. Ruihua Fan, Sagar Vijay, Ashvin Vishwanath, Yi-Zhuang You. *Self-organized error correction in random unitary circuits with measurement*. Physical Review B **103** (17), 174309 (2021).
45. Carlos M Duque, Hong-Ye Hu, Yi-Zhuang You, Vedika Khemani, Ruben Verresen, Romain Vasseur. *Topological and symmetry-enriched random quantum critical points*. Physical Review B **103** (10), L100207 (2021).
46. Ce Wang, Haiwei Li, Zhenqi Hao, Xintong Li, Changwei Zou, Peng Cai, Yayu Wang, Yi-Zhuang You, Hui Zhai. *Machine learning identification of impurities in the STM images*. Chinese Physics B **29** (11), 116805 (2020).
47. AA Akhtar, Yi-Zhuang You. *Multiregion entanglement in locally scrambled quantum dynamics*. Physical Review B **102** (13), 134203 (2020).
48. Wei-Qiang Chen, Chao-Ming Jian, Liang Kong, Yi-Zhuang You, Hao Zheng. *Topological phase transition on the edge of two-dimensional Z<sub>2</sub> topological order*. Physical Review B **102** (4), 045139 (2020).
49. Wei-Ting Kuo, AA Akhtar, Daniel P Arovas, Yi-Zhuang You. *Markovian entanglement dynamics under locally scrambled quantum evolution*. Physical Review B **101** (22), 224202 (2020).

50. Hong-Ye Hu, Shuo-Hui Li, Lei Wang, Yi-Zhuang You. *Machine learning holographic mapping by neural network renormalization group*. Physical Review Research **2** (2), 023369 (2020).
51. Huitao Shen, Pengfei Zhang, Yi-Zhuang You, Hui Zhai. *Information scrambling in quantum neural networks*. Physical Review Letters **124** (20), 200504 (2020).
52. Chao-Ming Jian, Yi-Zhuang You, Romain Vasseur, Andreas WW Ludwig. *Measurement-induced criticality in random quantum circuits*. Physical Review B **101** (10), 104302 (2020).
53. Juven Wang, Yi-Zhuang You, Yunqin Zheng. *Gauge enhanced quantum criticality and time reversal deconfined domain wall:  $SU(2)$  Yang-Mills dynamics with topological terms*. Physical Review Research **2** (1), 013189 (2020).
54. Jong Yeon Lee, Yi-Zhuang You, Subir Sachdev, Ashvin Vishwanath. *Signatures of a Deconfined Phase Transition on the Shastry-Sutherland Lattice: Applications to Quantum Critical  $SrCu_2(BO_3)_2$* . Physical Review X **9** (4), 041037 (2019).
55. Romain Vasseur, Andrew C Potter, Yi-Zhuang You, Andreas WW Ludwig. *Entanglement transitions from holographic random tensor networks*. Physical Review B **100** (13), 134203 (2019).
56. Ce Wang, Hui Zhai, Yi-Zhuang You. *Emergent Schrödinger equation in an introspective machine learning architecture*. Science Bulletin **64** (17), 1228-1233 (2019).
57. Rui-Zhen Huang, Da-Chuan Lu, Yi-Zhuang You, Zi Yang Meng, Tao Xiang. *Emergent symmetry and conserved current at a one-dimensional incarnation of deconfined quantum critical point*. Physical Review B **100** (12), 125137 (2019).
58. Wei Wang, Da-Chuan Lu, Xiao Yan Xu, Yi-Zhuang You, Zi Yang Meng. *Dynamics of compact quantum electrodynamics at large fermion flavor*. Physical Review B **100** (8), 085123 (2019).
59. Chao-Ming Jian, Zhen Bi, Yi-Zhuang You. *Lattice construction of duality with non-Abelian gauge fields in  $2+1D$* . Physical Review B **100** (7), 075109 (2019).
60. Zhihuang Luo, Yi-Zhuang You, Jun Li, Chao-Ming Jian, Dawei Lu, Cenke Xu, Bei Zeng, Raymond Laflamme. *Quantum simulation of the non-fermi-liquid state of Sachdev-Ye-Kitaev model*. Npj Quantum Information **5** (1), 53 (2019).
61. Nvsen Ma, Yi-Zhuang You, Zi Yang Meng. *Role of Noether's theorem at the deconfined quantum critical point*. Physical Review Letters **122** (17), 175701 (2019).
62. Yi-Zhuang You, Ashvin Vishwanath. *Superconductivity from valley fluctuations and approximate  $SO(4)$  symmetry in a weak coupling theory of twisted bilayer graphene*. Npj Quantum Materials **4** (1), 16 (2019).
63. Nvsen Ma, Guang-Yu Sun, Yi-Zhuang You, Cenke Xu, Ashvin Vishwanath, Anders W Sandvik, Zi Yang Meng. *Dynamical signature of fractionalization at a deconfined quantum critical point*. Physical Review B **98** (17), 174421 (2018).
64. Xiaochuan Wu, Xiao Chen, Chao-Ming Jian, Yi-Zhuang You, Cenke Xu. *Candidate theory for the strange metal phase at a finite-energy window*. Physical Review B **98** (16), 165117 (2018).
65. Yi-Zhuang You, Yingfei Gu. *Entanglement features of random Hamiltonian dynamics*. Physical Review B **98** (1), 014309 (2018).
66. Meng Cheng, Zhen Bi, Yi-Zhuang You, Zheng-Cheng Gu. *Classification of symmetry-protected phases for interacting fermions in two dimensions*. Physical Review B **97** (20), 205109 (2018).
67. Yi-Zhuang You, Yin-Chen He, Ashvin Vishwanath, Cenke Xu. *From bosonic topological transition to symmetric fermion mass generation*. Physical Review B **97** (12), 125112 (2018).
68. Yi-Zhuang You, Zhao Yang, Xiao-Liang Qi. *Machine learning spatial geometry from entanglement features*. Physical Review B **97** (4), 045153 (2018).
69. Yi-Zhuang You, Yin-Chen He, Cenke Xu, Ashvin Vishwanath. *Symmetric fermion mass generation as deconfined quantum criticality*. Physical Review X **8** (1), 011026 (2018).

70. Xiao-Liang Qi, Zhao Yang, Yi-Zhuang You. *Holographic coherent states from random tensor networks*. Journal of High Energy Physics **2017** (8), 1-29 (2017).
71. Yan Qi Qin, Yuan-Yao He, Yi-Zhuang You, Zhong-Yi Lu, Arnab Sen, Anders W Sandvik, Cenke Xu, Zi Yang Meng. *Duality between the deconfined quantum-critical point and the bosonic topological transition*. Physical Review X **7** (3), 031052 (2017).
72. Zhen Bi, Chao-Ming Jian, Yi-Zhuang You, Kelly Ann Pawlak, Cenke Xu. *Instability of the non-Fermi-liquid state of the Sachdev-Ye-Kitaev model*. Physical Review B **95** (20), 205105 (2017).
73. Kevin Slagle, Zhen Bi, Yi-Zhuang You, Cenke Xu. *Out-of-time-order correlation in marginal many-body localized systems*. Physical Review B **95** (16), 165136 (2017).
74. Zhen Bi, Ruixing Zhang, Yi-Zhuang You, Andrea Young, Leon Balents, Chao-Xing Liu, Cenke Xu. *Bilayer graphene as a platform for bosonic symmetry-protected topological states*. Physical Review Letters **118** (12), 126801 (2017).
75. Yi-Zhuang You, Andreas WW Ludwig, Cenke Xu. *Sachdev-Ye-Kitaev model and thermalization on the boundary of many-body localized fermionic symmetry-protected topological states*. Physical Review B **95** (11), 115150 (2017).
76. Yuan-Yao He, Han-Qing Wu, Yi-Zhuang You, Cenke Xu, Zi Yang Meng, Zhong-Yi Lu. *Quantum critical point of Dirac fermion mass generation without spontaneous symmetry breaking*. Physical Review B **94** (24), 241111 (2016).
77. Han-Qing Wu, Yuan-Yao He, Yi-Zhuang You, Tsuneya Yoshida, Norio Kawakami, Cenke Xu, Zi Yang Meng, Zhong-Yi Lu. *Visualizing a bosonic symmetry protected topological phase in an interacting fermion model*. Physical Review B **94** (16), 165121 (2016).
78. Xue-Yang Song, Yi-Zhuang You, Leon Balents. *Low-energy spin dynamics of the honeycomb spin liquid beyond the Kitaev limit*. Physical Review Letters **117** (3), 037209 (2016).
79. Kevin Slagle, Yi-Zhuang You, Cenke Xu. *Disordered XYZ spin chain simulations using the spectrum bifurcation renormalization group*. Physical Review B **94** (1), 014205 (2016).
80. Zhen Bi, Yi-Zhuang You, Cenke Xu. *Exotic quantum critical point on the surface of three-dimensional topological insulator*. Physical Review B **94** (2), 024433 (2016).
81. Yizhi You, Yi-Zhuang You. *Geometry defects in bosonic symmetry-protected topological phases*. Physical Review B **93** (24), 245135 (2016).
82. Yizhi You, Yi-Zhuang You. *Stripe melting and a transition between weak and strong symmetry protected topological phases*. Physical Review B **93** (19), 195141 (2016).
83. Yuan-Yao He, Han-Qing Wu, Yi-Zhuang You, Cenke Xu, Zi Yang Meng, Zhong-Yi Lu. *Bona fide interaction-driven topological phase transition in correlated symmetry-protected topological states*. Physical Review B **93** (11), 115150 (2016).
84. Yi-Zhuang You, Zhen Bi, Dan Mao, Cenke Xu. *Quantum phase transitions between bosonic symmetry-protected topological states without sign problem: Nonlinear sigma model with a topological term*. Physical Review B **93** (12), 125101 (2016).
85. Yi-Zhuang You, Xiao-Liang Qi, Cenke Xu. *Entanglement holographic mapping of many-body localized system by spectrum bifurcation renormalization group*. Physical Review B **93** (10), 104205 (2016).
86. Cenke Xu, Yi-Zhuang You. *Self-dual quantum electrodynamics as boundary state of the three-dimensional bosonic topological insulator*. Physical Review B **92** (22), 220416 (2015).
87. Han-Qing Wu, Yuan-Yao He, Yi-Zhuang You, Cenke Xu, Zi Yang Meng, Zhong-Yi Lu. *Quantum Monte Carlo study of strange correlator in interacting topological insulators*. Physical Review B **92** (16), 165123 (2015).
88. Yi-Zhuang You, Cenke Xu. *Topological orders with global gauge anomalies*. Physical Review B **92** (5), 054410 (2015).
89. Yi-Zhuang You, Zhen Bi, Alex Rasmussen, Meng Cheng, Cenke Xu. *Bridging fermionic and bosonic short range entangled states*. New Journal of Physics **17**, 075010 (2015).

90. Yi-Zhuang You, Cenke Xu. *Interacting topological insulator and emergent grand unified theory*. Physical Review B **91** (12), 125147 (2015).
91. Kevin Slagle, Yi-Zhuang You, Cenke Xu. *Exotic quantum phase transitions of strongly interacting topological insulators*. Physical Review B **91** (11), 115121 (2015).
92. Cenke Xu, Yi-Zhuang You. *Bosonic short-range entangled states beyond group cohomology classification*. Physical Review B **91** (5), 054406 (2015).
93. Yi-Zhuang You, Zheng-Yu Weng. *Coexisting itinerant and localized electrons*. Iron-Based Superconductivity, 377-408 (2015).
94. Yi-Zhuang You, Cenke Xu. *Symmetry-protected topological states of interacting fermions and bosons*. Physical Review B **90** (24), 245120 (2014).
95. Zhen Bi, Yi-Zhuang You, Cenke Xu. *Anyon and loop braiding statistics in field theories with a topological  $\Theta$  term*. Physical Review B **90** (8), 081110 (2014).
96. Yi-Zhuang You, Zhong Wang, Jeremy Oon, Cenke Xu. *Topological number and fermion Green's function for strongly interacting topological superconductors*. Physical Review B **90** (6), 060502 (2014).
97. Peng Zhang, Pierre Richard, Tian Qian, Xun Shi, Jun Ma, L-K Zeng, X-P Wang, Emile Rienks, C-L Zhang, Pengcheng Dai, Y-Z You, Z-Y Weng, X-X Wu, JP Hu, Hong Ding. *Observation of Momentum-Confined In-Gap Impurity State in Ba0.6K0.4Fe2As2: Evidence for Antiphase  $s_{\pm}$  Pairing*. Physical Review X **4** (3), 031001 (2014).
98. Yi-Zhuang You, Zhen Bi, Alex Rasmussen, Kevin Slagle, Cenke Xu. *Wave function and strange correlator of short-range entangled states*. Physical Review Letters **112** (24), 247202 (2014).
99. Yi-Zhuang You, Zheng-Yu Weng. *Two-fluid description for iron-based superconductors*. New Journal of Physics **16** (2), 023001 (2014).
100. Yi-Zhuang You, Chao-Ming Jian, Xiao-Gang Wen. *Synthetic non-Abelian statistics by Abelian anyon condensation*. Physical Review B **87** (4), 045106 (2013).
101. Yi-Zhuang You, Zhu Chen, Xiao-Qi Sun, Hui Zhai. *Superfluidity of bosons in kagome lattices with frustration*. Physical Review Letters **109** (26), 265302 (2012).
102. Yi-Zhuang You, Xiao-Gang Wen. *Projective non-Abelian statistics of dislocation defects in a ZN rotor model*. Physical Review B **86** (16), 161107 (2012).
103. Yi-Zhuang You, Itamar Kimchi, Ashvin Vishwanath. *Doping a spin-orbit Mott insulator: Topological superconductivity from the Kitaev-Heisenberg model and possible application to (Na2/Li2)IrO3*. Physical Review B **86** (8), 085145 (2012).
104. Xiaodong Zhou, Peng Cai, Aifeng Wang, Wei Ruan, Cun Ye, Xianhui Chen, Yizhuang You, Zheng-Yu Weng, Yayu Wang. *Evolution from Unconventional Spin Density Wave to Superconductivity and a Pseudogaplike Phase in NaFe1-xCoxAs*. Physical Review Letters **109** (3), 037002 (2012).
105. Itamar Kimchi, Yi-Zhuang You. *Kitaev-Heisenberg-J2-J3 model for the iridates A2IrO3*. Physical Review B **84** (18), 180407 (2011).
106. Yi-Zhuang You, Fan Yang, Su-Peng Kou, Zheng-Yu Weng. *Phase Diagram and a Possible Unified Description of Intercalated Iron Selenide Superconductors*. Physical Review Letters **107** (16), 167001 (2011).
107. Yi-Zhuang You, Fan Yang, Su-Peng Kou, Zheng-Yu Weng. *Magnetic and superconducting instabilities in a hybrid model of itinerant/localized electrons for iron pnictides*. Physical Review B **84** (5), 054527 (2011).
108. Yi-Zhuang You, Hong Yao, Dung-Hai Lee. *Spin excitations of the block-antiferromagnetic state in K0.8Fe1.6Se2*. Physical Review B **84** (2), 020406 (2011).
109. CN Yang, Yi-Zhuang You. *One-dimensional w-component fermions and bosons with repulsive delta function interaction*. Chinese Physics Letters **28** (2), 020503 (2011).

10. Yi-Zhuang You. *Ground State Energy of One-Dimensional  $\delta$ -Function Interacting Bose and Fermi Gas*. Chin. Phys. Lett. **27** (8), 080305-080305 (2010).
11. Yizhuang You, Xiaohan Wang, Sihui Wang, Yonghua Pan, Jin Zhou. *A new method to demonstrate frustrated total internal reflection in the visible band*. American Journal of Physics **76** (3), 224-228 (2008).
12. 尤亦庄, 王晓翰, 王喆, 龚国斌, 潘永华. *音叉振动阻尼系数的测定与研究*. 大学物理 **26** (5), 58-58 (2007).

## Preprints:

1. Da-Chuan Lu, Fu Xu, Yi-Zhuang You. *Strange correlator and string order parameter for non-invertible symmetry protected topological phases in  $1+1d$* . ArXiv Preprint arXiv:2505.00673 (2025).
2. Sheng Yang, Fu Xu, Da-Chuan Lu, Yi-Zhuang You, Hai-Qing Lin, Xue-Jia Yu. *Deconfined criticality as intrinsically gapless topological state in one dimension*. ArXiv Preprint arXiv:2503.01198 (2025).
3. Chuanxin Wang, Yi-Zhuang You. *Machine Learning for Ground State Preparation via Measurement and Feedback*. ArXiv Preprint arXiv:2502.06517 (2025).
4. Zheyang Wan, Juven Wang, Yi-Zhuang You. *Topological Responses of the Standard Model Gauge Group*. ArXiv Preprint arXiv:2412.21196 (2024).
5. Yang-Yang Li, Juven Wang, Yi-Zhuang You. *Quantum Many-Body Lattice CRT Symmetry: Fractionalization, Anomaly, and Symmetric Mass Generation*. ArXiv Preprint arXiv:2412.19691 (2024).
6. Wanda Hou, Molan Li, Yi-Zhuang You. *Machine Learning Symmetry Discovery for Classical Mechanics*. ArXiv Preprint arXiv:2412.14632 (2024).
7. Yang-Yang Li, Zheyang Wan, Juven Wang, Shing-Tung Yau, Yi-Zhuang You. *CRT Fractionalization in the First Quantized Hamiltonian Theory*. ArXiv Preprint arXiv:2412.11958 (2024).
8. Yadong Wu, Ce Wang, Juan Yao, Hui Zhai, Yi-Zhuang You, Pengfei Zhang. *Contractive unitary and classical shadow tomography*. ArXiv Preprint arXiv:2412.01850 (2024).
9. Jian Yao, Yi-Zhuang You. *ShadowGPT: Learning to Solve Quantum Many-Body Problems from Randomized Measurements*. ArXiv Preprint arXiv:2411.03285 (2024).
10. Meng Zeng, Fu Xu, Da-Chuan Lu, Yi-Zhuang You. *Optical conductivity in symmetric mass generation insulators*. ArXiv Preprint arXiv:2405.05339 (2024).
11. Ahmed A Akhtar, Namit Anand, Jeffrey Marshall, Yi-Zhuang You. *Dual-unitary classical shadow tomography*. ArXiv E-prints arXiv:2404.01068 (FERMILAB-PUB-24-0504-SQMS-V; arXiv: 2404) (2024).
12. Zheyang Wan, Juven Wang, Shing-Tung Yau, Yi-Zhuang You. *CRT Fractionalization, Fermions, and Mod 8 Periodicity*. ArXiv Preprint arXiv:2312.17126 (2023).
13. Weitang Liu, Ying Wai Li, Tianle Wang, Yi-Zhuang You, Jingbo Shang. *OMNIINPUT: A Model-centric Evaluation Framework through Output Distribution*. ArXiv Preprint arXiv:2312.03291 (2023).
14. Weitang Liu, Ying Wai Li, Yuelei Li, Zihan Wang, Yi-Zhuang You, Jingbo Shang. *Evaluation of human-model prediction difference on the Internet Scale of Data*. ArXiv E-prints, arXiv: 2312.03291 (2023).
15. Da-Chuan Lu, Miao Li, Zhao-Yi Zeng, Wanda Hou, Juven Wang, Fan Yang, Yi-Zhuang You. *Superconductivity from Doping Symmetric Mass Generation Insulators: Application to  $La_3Ni_2O_7$  under Pressure*. ArXiv Preprint arXiv:2308.11195 (2023).
16. Hung-Hwa Lin, Wei-Ting Kuo, Daniel P Arovas, Yi-Zhuang You. *Fluctuation of Chern Numbers in a Parametric Random Matrix Model*. ArXiv Preprint arXiv:2207.12562 (2022).
17. Hong-Ye Hu, Ryan LaRose, Yi-Zhuang You, Eleanor Rieffel, Zhihui Wang. *Logical shadow tomography: Efficient estimation of error-mitigated observables*. ArXiv Preprint arXiv:2203.07263 (2022).



18. Zhihuang Luo, Yi-Zhuang You, Jun Li, Chao-Ming Jian, Dawei Lu, Cenke Xu, Bei Zeng, Raymond Laflamme. *Observing fermion pair instability of the Sachdev-Ye-Kitaev model on a quantum spin simulator*. ArXiv Preprint arXiv:1712.06458 (2017).
19. Chao-Ming Jian, Alex Rasmussen, Yi-Zhuang You, Cenke Xu. *Emergent symmetry and tricritical points near the deconfined quantum critical point*. ArXiv Preprint arXiv:1708.03050 (2017).
20. Alex Rasmussen, Yi-Zhuang You, Cenke Xu. *Stable gapless bose liquid phases without any symmetry*. ArXiv Preprint arXiv:1601.08235 (2016).
21. Kevin Slagle, Zhen Bi, Yi-Zhuang You, Cenke Xu. *Many-body localization of symmetry protected topological states*. ArXiv Preprint arXiv:1505.05147 (2015).
22. Yi-Zhuang You, Meng Cheng. *Measuring modular matrices by shearing lattices*. ArXiv Preprint arXiv:1502.03192 (2015).
23. Yi-Zhuang You, Yoni BenTov, Cenke Xu. *Interacting Topological Superconductors and possible Origin of 16n Chiral Fermions in the Standard Model*. ArXiv Preprint arXiv:1402.4151 (2014).
24. Fangzhou Liu, Zhenghan Wang, Yi-Zhuang You, Xiao-Gang Wen. *Modular transformations and topological orders in two dimensions*. ArXiv Preprint arXiv:1303.0829 (2013).

## Talks

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### Invited Talks:

- *Can large language model speak the quantum language*. Aspen Winter Conference: AI + Quantum, Aspen. February 13 (2025).
- *Can large language model speak the quantum language*. Geometry and Correlations in Low-dimensional and Topological Materials, Hong Kong. December 13 (2024).
- *Realizing non-invertible symmetries in quantum circuits by twisted gauging*. Simons Center for Geometry and Physics: Quantum Information Dynamics and Non-Equilibrium Quantum Matter, New York. December 2 (2024).
- *Emergent classicality of information bottleneck*. Perimeter Institute: the conference on Machine Learning for Quantum Many-Body Systems, Princeton. June 15 (2023).
- *Scalable classical shadow tomography with shallow circuits and quantum dynamics*. KITP Program: Quantum Many-Body Dynamics and Noisy Intermediate-Scale Quantum Systems, Santa Barbara. September 7 (2022).
- *Symmetric mass generation*. Paths to Quantum Field Theory 2022, Durham UK. August 19 (2022).
- *Renormalization group and generative modeling*. Institute for Artificial Intelligence and Fundamental Interactions (IAIFI) workshop, Boston. August 9 (2022).
- *Deconfined quantum criticality beyond the Standard Model*. Simons Collaboration on Ultra-Quantum Matter Annual Meeting. January 21 (2022).
- *Renormalization group and machine learning*. Conference on Causality Emergence, Swarmer Club, Beijing. August 20 (2021).
- *Entanglement feature and locally scrambled quantum dynamics*. Recent Advances on Theories of Quantum Matters, Institute for Advanced Study, Tsinghua University. January 5 (2021).
- *Entanglement feature and locally scrambled quantum dynamics*. Dynamics, Criticality, and Universality in Random Quantum Circuits, Princeton University. October 2 (2020).
- *Machine learning physics: from quantum mechanics to holographic geometry*. Machine Learning for Quantum Design, Perimeter Institute. July 11 (2019).

- *Emergent symmetry and conserved currents at deconfined quantum critical points*. KIAS Workshop on Topology and Correlation in Quantum Materials, Korean Institute for Advanced Study. May 29 (2019).
- *Machine learning holography*. Machine Learning Meets Physics, Microsoft Research in Redmond. April 26 (2019).
- *Emergent symmetry and conserved currents at deconfined quantum critical points*. Topological Aspects of Condensed Matter, Harvard University (CMSA). April 1 (2019).
- *Machine learning physics: from quantum mechanics to holographic geometry*. APS March Meeting, Invited Talk. February 13 (2019).
- *Entanglement features of random Hamiltonian dynamics*. Conference on Novel Approaches to Quantum Dynamics, Kavli Institute for Theoretical Physics. August 30 (2018).
- *Valley fluctuations and  $SO(4)$  symmetry in twisted bilayer graphene*. Workshop on Electron Correlation and Superconductivity in Graphene and Related Materials: Moire is Different, Kavli Institute of Theoretical Science, Beijing. July 12 (2018).
- *Machine learning holography*. The First International Conference on Machine Learning and Physics, Tsinghua University, Beijing. July 6 (2018).
- *Deconfined criticality - from bosonic topological transitions to symmetric mass generation*. International Workshop on New Paradigms in Quantum Matter, Institute of Physics Chinese Academy of Science, Beijing. June 28 (2018).
- *Machine learning holography*. Workshop on Machine Learning in Geometry and Physics, Tsinghua Sanya International Math Center, Sanya. June 14 (2018).
- *From bosonic topological transition to symmetric mass generation*. Workshop on Field Theory Dualities and Strongly Correlated Matter, Aspen Center for Theoretical Physics. March 20 (2018).
- *Exotic quantum criticalities among  $2+1D$  symmetry protected topological phases*. Workshop on Entanglement Universality in Correlated Electronic Systems, Southern University of Science and Technology of China. December 23 (2017).
- *Tensor network holography and deep learning*. Western Forum on Machine Learning and its Applications, Sichuan Normal University. December 13 (2017).
- *Symmetric mass generation in Dirac semimetals*. Workshop on Chaos, Duality, and Topology in Condensed matter Physics, University of Illinois at Urbana-Champaign. November 4 (2017).
- *Hyperbolic network, Boltzmann machine and holographic duality*. Frontiers in Artificial Intelligence and Application, Tsinghua University. July 22 (2017).
- *Machine learning and tensor network holography*. Workshop on Machine Learning and Many-Body Physics, Kavli Institute for Theoretical Science. June 30 (2017).
- *Bilayer graphene as a platform for bosonic symmetry protected topological states*. Many-body Entanglement and Topological Quantum Phenomena Workshop, Tsinghua Sanya International Mathematics Forum. December 13 (2016).
- *Exotic topological phase transitions in correlated spin-orbit coupled systems*. Program on New Phases and Emergent Phenomena in Correlated Materials with Strong Spin-Orbit Coupling, Kavli Institute for Theoretical Physics. September 3 (2015).
- *Exotic quantum phase transitions in strongly interacting topological insulators*. Asia Pacific Workshop, Zhejiang University. April 14 (2015).
- *Two-fluid model for Iron-based superconductors*. Beijing Forum on High-Temperature Superconductivity, Tengchong. May 30 (2013).

### Seminar Talks:

- *Can large language model speak the quantum language*. Georgia Institute of Technology. February 20 (2025).

- *Classical shadow tomography with locally scrambled quantum dynamics*. Hong Kong University of Science and Technology. December 10 (2024).
- *Emergent classicality from information bottleneck*. Shenzhen University. January 29 (2024).
- *Emergent classicality from information bottleneck*. University of Tennessee. September 20 (2023).
- *Fermi surface anomaly and symmetric mass generation*. Simons Center of Geometry and Physics. May 24 (2023).
- *Fermi surface anomaly and symmetric mass generation*. Ohio State University. April 10 (2023).
- *Fermi surface anomaly and symmetric mass generation*. University of California, Santa Barbara. March 31 (2023).
- *Symmetric mass generation*. University of Colorado Boulder. March 24 (2023).
- *Classical shadow tomography with locally scrambled quantum dynamics*. Texas A&M University. April 23 (2022).
- *Deconfined quantum criticality beyond the Standard Model*. University of California, Santa Barbara. January 28 (2022).
- *Intervalley coherence and intervalley superconductivity in ABC-stacked trilayer graphene*. University of Florida. November 29 (2021).
- *Intervalley coherence and intervalley superconductivity in ABC-stacked trilayer graphene*. University of California, Berkeley. October 6 (2021).
- *Machine learning physics: from quantum mechanics to holographic geometry*. Alibaba DAMO Academy. August 19 (2021).
- *Quantum magnetism in Wannier-obstructed Mott insulators*. Pennsylvania State University. February 12 (2021).
- *Machine learning physics: from quantum mechanics to holographic geometry*. University of Southern California. March 9 (2020).
- *Machine learning physics: from quantum mechanics to holographic geometry*. California Institute of Technology. October 21 (2019).
- *Machine learning physics: from quantum mechanics to holographic geometry*. University of California, Riverside. May 13 (2019).
- *Machine learning physics: from quantum mechanics to holographic geometry*. Harvard University. April 17 (2019).
- *Application of machine learning in quantum physics*. Philips (China) Investment Co. Ltd., Beijing. July 20 (2018).
- *Symmetry protected topological phases and phase transitions*. Tsinghua University. July 17–19 (2018).
- *From bosonic topological transitions to symmetric mass generation*. Sun Yat-Sen University. June 21 (2018).
- *Tensor network holography and deep learning*. Pennsylvania State University. April 9 (2018).
- *Dynamical signature of fractionalization at the deconfined quantum critical point*. Massachusetts Institute of Technology. March 27 (2018).
- *Tensor network holography and deep learning*. University of Massachusetts Amherst. February 27 (2018).
- *Tensor network holography and deep learning*. California Institute of Technology. November 27 (2017).
- *Tensor network holography and deep learning*. Perimeter Institute. November 21 (2017).
- *Bosonic symmetry protected topological states: theory, numerics, and experimental platform*. Yale University. May 18 (2017).
- *From symmetric mass generation to Sachdev-Ye-Kitaev model*. Brown University. May 10 (2017).
- *Bosonic symmetry protected topological states: theory, numerics, and experimental platform*. University of Maryland, College Park. February 28 (2017).
- *Bosonic symmetry protected topological states: theory, numerics, and experimental platform*. University of Virginia. February 16 (2017).

- *Bosonic symmetry protected topological states: theory, numerics, and experimental platform*. University of California, San Diego. January 25 (2017).
- *Sachdev-Ye-Kitaev model and thermalization on the boundary of many-body localized fermionic symmetry protected topological states*. Harvard University. November 1 (2016).
- *Entanglement holographic mapping of many-body localized system by spectrum bifurcation renormalization group*. Tsinghua University. September 21 (2016).
- *Entanglement holographic mapping of many-body localized system by spectrum bifurcation renormalization group*. University of California, Berkeley. April 26 (2016).
- *Entanglement holographic mapping of many-body localized system by spectrum bifurcation renormalization group*. California State University, Northridge. February 19 (2016).
- *Holographic mapping of many-body localized system by spectrum bifurcation renormalization group*. Perimeter Institute. December 4 (2015).
- *Fermion Green's function and strange correlator of strongly interacting topological superconductors*. Tsinghua University. June 26 (2014).

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I hereby certify that the above information is true and correct to the best of my knowledge and belief.



Yi-Zhuang You  
San Diego, 2025/6/14