

# **CURRICULUM VITAE**

## **Xin Wan**

Zhejiang Institute of Modern Physics  
Zhejiang University  
Hangzhou, 310027, China  
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### **EDUCATION**

Ph.D. (2000), M.A. (1997) September 1995 to September 2000  
Department of Electrical Engineering, Princeton University, Princeton, New Jersey, U.S.A.  
Advisor: Prof. Ravin Bhatt

B.Sc. (1995) September 1990 to July 1995  
Department of Physics, Fudan University, Shanghai, China.

### **PROFESSIONAL EXPERIENCE**

Professor of Physics May 2005 to present  
Zhejiang Institute of Modern Physics, Zhejiang University, Hangzhou, China

Scientific Staff Member (Wissenschaftlicher Mitarbeiter) June 2003 to May 2005  
Institute for Nanotechnology, Karlsruhe Research Center, Karlsruhe, Germany  
(now Karlsruhe Institute of Technology)

Postdoc Research Associate September 2000 to May 2003  
National High Magnetic Field Laboratory (NHMFL), Tallahassee, Florida, U.S.A.

### **OTHER PROFESSIONAL EXPERIENCE**

Adjunct Professor of Physics June 2008 to October 2010  
Pohang University of Science and Technology, Pohang, Korea

Leader of Independent Junior Research Group June 2008 to October 2010  
Asia Pacific Center for Theoretical Physics, Pohang, Korea (on leave from Zhejiang University)

### **HONORS AND AWARDS**

- Yongping Teaching Contribution Nomination Award, Zhejiang University, 2018
- Undergraduate Teaching Award, Faculty of Science, Zhejiang University, 2012
- Best Lecturer Award, Chu Kochen Honors College, Zhejiang University, 2011
- Daniel Tsui Fellowship, University of Hong Kong, 2011
- Faculty Award for Excellence, Zhejiang University, 2007
- Ray Grimm Memorial Prize in Computational Physics, Princeton University, 1999
- T. D. Lee Fellowship in Physics, Fudan University, 1990

## TEACHING

- Spring 2019, Advanced Statistical Mechanics
- Spring 2014-19, College Physics I (H)
- Spring 2018, Mesoscopic Physics and Quantum Transport Theory
- Spring 2017, Solid State Theory I
- Fall 2015, Quantum Information and Quantum Computation
- Spring 2013-14, Solid State Physics
- Spring 2011-13, Thermal Physics
- Fall 2011, Quantum States of Matter and Quantum Phase Transitions
- Fall 2006/2007/2010, Fundamentals of Semiconductor Physics
- Fall 2005, Quantum Mechanics II

## RESEARCH INTEREST

I am interested in topological phases of matter and topological quantum computation. The research goal is to understand and to bridge the connections between condensed matter systems, low-dimensional field theories, low-dimensional topology, and quantum information science. Such connections may, hopefully, lead to the eventual realization of quantum computers in exotic condensed matter systems such as non-Abelian fractional quantum Hall liquids. I am also interested in unusual phases and phase transitions in spin and electronic systems. Recently, I start to work on machine learning techniques and apply them to understand phases and phase transitions.

## CONFERENCE ORGANIZATION

1. 2017 Hangzhou Symposium for Young Researchers on the Frontier of Theoretical Physics Hangzhou, April 3-7, 2017. [Co-organizers: Bo Feng and Xiao-Guang Wang (Zhejiang University)]
2. Workshop on Disordered and Topological Systems, Hangzhou, March 18-22, 2013. [Co-organizers: Ravin Bhatt (Princeton) and Ming-Chiang Chung (Chung-Hsing)]
3. 2012 Hangzhou Workshop on Quantum Matter, Hangzhou, April 2-6, 2012. [Co-organizers: Zhuan Xu and Huiqiu Yuan (Zhejiang University)]
4. AMS-APCTP Conference on Localisation 2011 (an LT26 satellite meeting), Pohang, Korea, August 4-7, 2011. [Chair of the Organization Committee: Bernhard Kramer (Jacobs University)]
5. Tuo Pu (topology) @ Pu Tuo (an island in Zhejiang Province) 2011, Zhoushan, May 21-22, 2011. [Co-organizers: Ying Liu (Penn State) and Xunya Jiang (Chinese Academy of Sciences)]
6. POSTECH-APCTP Advanced Materials Science Workshop on Metal-Insulator Transitions in Disordered and Magnetic Systems, Pohang, August 30-September 10, 2010. [Co-organizer: Stefan Kettmann (Jacobs/POSTECH)]

7. APCTP-KIAS Joint Workshop on Quantum Entanglement and Dynamics in Correlated Many-Body Systems, Pohang, Korea, May 17 - May 21, 2010. [Co-organizers: Yong-Baek Kim (Toronto), Kwon Park (KIAS), and Gentaro Watanabe (APCTP)]
8. 2009 Workshop on Quantum Condensation, Pohang, Korea, August 17-28, 2009. [Co-organizer: Ming-Chiang Chung (Academia Sinica)]
9. Sino-German Workshop on Novel Concepts in Disordered and Interacting Quantum Systems, Hangzhou, March 11-18, 2007. [Co-coordinator: Peter Wölfle (Karlsruhe)]
10. Mini-Workshop on Topological Quantum Computation, Hangzhou, July 6-7, 2006. [Co-organizers: Zhenghan Wang (Microsoft Station Q) and Kun Yang (NHMFL/FSU)]

## INVITED CONFERENCE PRESENTATIONS

1. “A Convolutional Neural Network Study of Critical Exponent in a Quantum Hall Plateau Transition”, The 2nd APCTP Alumni Scientific Symposium, Gyeongju, November 8, 2018.
2. “Convolutional Neural Network Study of Critical Exponents”, Workshop on Anderson Localization and Interactions, MPI-PKS, Dresden, September 28, 2018.
3. “Toward a Particle-Hole Symmetric Description of the Fractional Quantum Hall State at  $5/2$  filling”, New Frontiers of Strongly Correlated Electron Materials, Kavli Institute of Theoretical Sciences, Beijing, August 23, 2018.
4. “Particle-Hole Symmetric Fractional Quantum Hall State at  $\nu = 5/2$ ”, The 4th Conference on Condensed Matter Physics, Shanghai, July 7, 2018.
5. “Geometrical Description of the Quantum Hall Effect and its Principal Component Analysis”, The 8th Workshop on Quantum Many-Body Computation, Hangzhou, April 22, 2018.
6. “Exploring Quantum Phase Transitions via Deep Learning”, Novel Quantum States in Condensed Matter 2017, Yukawa Institute for Theoretical Physics, Kyoto University, October 23, 2017.
7. “Learning Phases and Phase Transitions with Neural Networks”, CSRC Symposium on Deep Learning and Applications, Beijing Computational Science Research Center, July 14, 2017.
8. “Learning Phases and Phase Transitions with Neural Networks”, International Workshop on Emerging Electronic Materials and Devices, Shenzhen, July 8, 2017.
9. “Striped quantum Hall phase at  $5/2$  Landau level filling”, The 15th Chinese Conference on Low-Temperature Physics, Shaoguan, November 16, 2016.
10. “Emergent criticality revealed by quantum entanglement”, Workshop of Quantum Connection, Wilczek Quantum Center, Zhejiang Institute of Technology, November 6, 2016.
11. “Non-Abelian striped phase in a half-filled Landau level”, 19th Chinese Conference on Condensed Matter Theory and Statistical Physics, Xiangtan, July 16, 2016.
12. “Emergent Criticality Revealed by Quantum Entanglement”, International Workshop on Entanglement, Quantum Information and Topological Orders, Fudan University, Shanghai, December 17-23, 2015.
13. “Striped Quantum Hall State in a Half-filled Landau Level”, 2015 Autumn Young Scientists Symposium, Zhejiang University and Institute of Physics, Chinese Academy of Sciences, Hangzhou, November 7, 2015.

14. “Delocalization transition emerged in the entanglement spectrum of topological systems”, POSTECH-APCTP Workshop on Delocalization Transitions in Disordered Systems, Pohang, Korea, July 24-August 2, 2015.
15. “Emergent infinite-randomness fixed point from the extensive random bipartitions of an AKLT state”, 2015 Conference on Condensed Matter Physics, Tsinghua University, Beijing, July 15-17, 2015.
16. “Emergent critical entanglement spectrum of the one-dimensional AKLT state”, 2015 International Workshop on Unconventional superconductivity: Its varieties and possible uses, Shanghai Center for Complex Physics, Shanghai Jiaotong University, Shanghai, June 8-11, 2015.
17. “Topologically distinct critical theories emerging from the bulk entanglement spectrum of integer quantum Hall states”, APCTP 2014 Workshop on Frontiers of Physics, Muju Resort, Korea, December 20-23, 2014.
18. “Criticality Revealed by Bulk Entanglement Spectrum”, Workshop on Interacting Electrons and Topological Matter, Beijing, December 15-17, 2014.
19. “Topological phase, edge theory, and critical behavior: A triangular entanglement”, Conference on Topological Aspects of Quantum Matter, NCTS, Hsinchu, December 8-12, 2014.
20. “Critical entanglement spectrum of the one-dimensional AKLT state and beyond, Workshop on AdS/CFT, Entanglement, and Topological Aspects of Quantum Matter”, NCTS, Hsinchu, December 1-5, 2014.
21. “Single-mode approximation for rotational symmetry broken quantum Hall states”, The 10th China-Singapore Joint Symposium on Research Frontiers in Physics, Lanzhou, September 21-22, 2014.
22. “Edge-Mode Velocities in Fractional Quantum Hall Systems”, The 18th Conference on Condensed Matter Theory and Statistical Physics, Chongqing University, Chongqing, July 27-29, 2014.
23. “New Insights into Quantum Hall Plateau Transition”, The 13th International Conference on Condensed Matter Theory and Computational Material Science, Sichuan University, Chengdu, July 14-16, 2014.
24. “Matrix Product Representation for Fractional Quantum Hall States”, 2014 Workshop on Computational Physics, Hubei University, Wuhan, April 26-27, 2014.
25. “Anderson Transition in the Integer and Fractional Quantum Hall Regime – A Topological Look”, International Focus Workshop on Recent Progress and Perspectives in Scaling, Multifractality, Interactions, and Topological Effects Near Anderson Transitions, MPI-PKS, Dresden, Germany, March 11-14, 2014.

26. “Understanding Variational Wavefunctions for the Anisotropic Quantum Hall Effect”, Joint ICTP-VAST-APCTP Conference on Theoretical Physics in Topological Phases and Quantum Computation, Ba Vi National Park, Vietnam, December 16-19, 2013.
27. “Edge Tunneling of Fractional Quantum Hall Systems”, The 13th Chinese Conference on Low-Temperature Physics, Zunyi, Guizhou, October 21-23, 2013.
28. “Tunneling at the Edge of a Fractional Quantum Hall Liquid”, D. C. Tsui Laboratory Symposium, Institute of Physics, Chinese Academy of Sciences, Beijing, October 17, 2013.
29. “A Random Walk down Quantum Braids”, NCTS Workshop on Quantum Condensation (QC13), Tainan, August 26-September 6, 2013.
30. “Edge states and tunneling of quasiparticles in the Moore-Read state”, Majoranas in Solid State Workshop, Beijing University, Beijing, June 3-7, 2013.
31. “Scaling Behavior in the Tunneling Amplitude of Fractional Quantum Hall Quasiparticle”, International Workshop on Unconventional superconductivity: Its varieties and possible uses, Shanghai Jiao Tong University, Shanghai, May 6-10, 2013.
32. “The Silk Road to Topological Quantum Gates”, SSCP International Workshop on Topological Quantum Matters, Strongly Correlated Electrons, and Quantum Information, Shanghai Jiaotong University, Shanghai, January 12, 2013.
33. “Geometry and Topology of the Fractional Quantum Hall Effect”, Chinese Physical Society Fall Meeting, Zhongshan University, Guangzhou, September 23, 2012.
34. “Anisotropic quantum Hall states with a geometrical interpretation”, Focus Program on Quantum Condensation (QC12), Asia Pacific Center for Theoretical Physics, Pohang, Korea, August 22, 2012.
35. “Geometrical Description of Anisotropic Fractional Quantum Hall Systems”, Workshop on Critical Behavior of Lattice Models in Atomic and Molecular, Condensed Matter and Particle, Kavli Institute for Theoretical Physics China, Beijing, August 7, 2012.
36. “Tunneling at the Edge of Fractional Quantum Hall Systems”, Hong Kong-Hangzhou Workshop on Condensed Matter Physics, The University of Hong Kong, Hong Kong, April 16, 2012.
37. “Decoding Topology/Entanglement in Fractional Quantum Hall Systems”, Mini-workshop on Entanglement and Emergence, Tsinghua University, Beijing, January 18, 2012.
38. “The Moore-Read Fractional Quantum Hall State”, International Workshop for Young Researchers on Topological Quantum Phenomena in Condensed Matter with Broken Symmetries, Laforet Biwako, Shiga, Japan, November 2-5, 2011.
39. “Fractional Quantum Hall Quasiparticle Tunneling and Interference”, AMS-APCTP Conference on Localisation 2011, POSCO International Center, POSTECH, Pohang, Korea, August 4-7, 2011.

40. “Topology and Geometry in the Fractional Quantum Hall Effect”, 2011 Workshop on Quantum Condensation, Hong Kong University of Science and Technology, Hong Kong, July 4-15, 2011.
41. “Fractional Quantum Hall Systems for Topological Quantum Computation”, Symposium on Frontiers in Physics and Beyond, Shanghai Jiaotong University, Shanghai, June 4, 2011.
42. “Separating Edge from Bulk in Fractional Quantum Hall States”, 2010 Workshop on Quantum Condensation (QC10), Hsinchu, August 9-20, 2010.
43. “Topological Quantum Compiling: Perspectives from Disorder Physics”, Workshop on Topological Order and Quantum Computation, Moorea, French Polynesia, May 30-June 6, 2010.
44. “Probing Non-Abelian Anyons in the Quantum Hall Interferometry”, 2009 Hangzhou Workshop on Quantum Matter, Hangzhou, October 12-15, 2009.
45. “Interference of Non-Abelian Quasiparticles in Fractional Quantum Hall Systems”, Chinese Physics Society Fall Meeting, Shanghai, September 17-20, 2009.
46. “Neutral Velocity and Decoherence in  $\nu = 5/2$  Fractional Quantum Hall Interferometry”, Nordita Workshop on Quantum Hall Physics - Novel Systems and Applications, Nordita, Stockholm, Sweden, August 17-September 11, 2009.
47. “Topological Fractional Quantum Hall Liquid to Insulator Transition”, AMS workshop on Correlations in Disordered Systems, POSTECH, Pohang, Korea, August 3-14, 2009.
48. “Quantitative Analysis toward Understanding Quasiparticle Interference in the Moore-Read State”, Workshop on Topological Order: From Quantum Hall Systems to Magnetic Materials, MPI-PKS, Dresden, Germany, June 29-July 24, 2009.
49. “Quasiparticle Interference in the Moore-Read Quantum Hall State”, Workshop on Novel Topological States in Condensed Matter Physics, Hong Kong University, Hong Kong, June 22-24, 2009.
50. “Construct Functional Braids for Low-Leakage Topological Quantum Computing”, at the 15th Chinese Conference on Condensed Matter Theory and Statistical Physics, Hefei, September 12-14, 2008.
51. “Ising CFT in Fractional Quantum Hall Effect and its Application to Topological Quantum Computation”, at the APCTP Focus Program on Finite-size Technology in Low Dimensional Quantum System (IV), APCTP, Pohang, Korea, June 25-July 15, 2008.
52. “Semi-Realistic Study of Fractional Quantum Hall Systems”, at the International Workshop on Quantum Phases and Excitations in Quantum Hall Systems, MPI-PKS, Dresden, Germany, June 16-21, 2008.
53. “Excitation and Braiding of Anyons for Topological Quantum Computing”, Fudan Conference on Quantum Manipulation, Shanghai, December 6-9, 2007.

54. “Fractional Quantum Hall Effect: Topology Meets Quantum Computing”, Symposium on Trends in Condensed Matter Physics, Asia Pacific Center for Theoretical Physics, Pohang, Korea, December 7-8, 2007.
55. “Edge Excitations and Non-Abelian Statistics in the Moore-Read State”, Zhejiang University-Rice University Workshop on Quantum Matter, Hangzhou, October 16-17, 2006.
56. “Topological Quantum Computation”, Chinese Physical Society, Fall Meeting, Beijing, September 15-17, 2006.
57. “Spin Quantum Hall Effect in Disordered Superconducting Systems with Broken Time-Reversal Symmetry”, Chinese Physical Society, Fall Meeting, Wuhan, September 18-20, 2005.
58. “Application of Topological Quantum Numbers in the Fractional Quantum Hall Effect: the Calculation of Mobility Gap”, The 13th National Conference on Condensed Matter Theory and Statistical Physics, Yinchuan, August 25-27, 2005.
59. “Frustration and Disorder in Diluted Magnetic Semiconductors”, International Conference on Physics Education and Frontier Research (The 4th OCPA Joint Meeting of Chinese Physicists Worldwide), Shanghai, June 28-July 1, 2004.
60. “Unconventional Ferromagnetism in Diluted Magnetic Semiconductors”, Workshop on Collective Phenomena in Disordered Insulators and Spin Glasses, Aspen Center for Physics, Aspen, Colorado, USA, July 2002.

## **INVITED LECTURES**

1. “Entanglement Spectrum”, 6-hour Lecture Series in Mini-school on Entanglement and Topological Phases of Matter, Asia Pacific Center for Theoretical Physics, Pohang, January 29-February 1, 2018.
2. “Fractional Quantum Hall Effect”, 2-hour lecture in Summer School on the Frontier of Condensed Matter Theory, Yanshan University, Qinhuangdao, July 16-28, 2018.
3. “Topological phases of matter and matrix product states”, 2-hour Lecture in Summer School on Condensed Matter Theory, Nanjing University, August 27, 2016.
4. “FQH-based topological quantum computer: Materials, devices and algorithms”, 4-hour lecture Series in the Joint IAS-ICTP School on Quantum Information Processing, Nanyang Technological University, Singapore, January 18-29, 2016.
5. “Selected topics on fractional quantum Hall effect”, 6-hour Lecture Series, International Center for Quantum Materials, Peking University, November 3-17, 2015.
6. “From quantum Hall effect to topological quantum computation”, 8-hour Lecture Series, Center for Quantum Control, Fudan University, October 28-November 6, 2014.



7. “From quantum Hall effect to topological quantum computation”, 8-hour Lecture Series, Indian Institute of Technology Madras, Chennai, India, September 4-10, 2014.
8. “Anyons and Quantum Computation in Quantum Hall Systems”, 4-hour lecture Series in the Joint ICTP-VAST-APCTP Regional School on Theoretical Physics in Topological Phases and Quantum Computation, Institute of Physics, Vietnam Academy of Science and Technology, Hanoi, Vietnam, December 9-13, 2013.
9. “Fractional Quantum Hall Effect and Topological Quantum Computation”, 2-hour lecture in the ICAM-China Summer School on the New Concepts in Condensed Matter Physics, Weihai, Shandong Province, July 30-August 10, 2013.
10. “From Fractional Quantum Hall Effect to Topological Quantum Computation”, 2-hour lecture in the Summer School on Topological Quantum Phases and Phase Transitions, Zhejiang Normal University, Jinhua, Zhejiang Province, July 8-11, 2013.
11. “Lectures on Geometrical Aspects of Fractional Quantum Hall Effect”, Topological Quantum Computing Seminar, Beijing International Center for Mathematical Research, Peking University, Beijing, July 31, 2012.
12. “Fault-Tolerant Quantum Computation in Topological Systems”, 2-Hour Lecture at the Mini-Workshop on Topological Insulators, National Center for Theoretical Sciences, Hsinchu, July 29-30, 2011.
13. “From Fractional Quantum Hall Effect to Topological Quantum Computation”, 5-Hour Lecture Series at the Summer School on Topological Quantum Computation, Beijing International Center for Mathematical Research, Peking University, Beijing, July 11-29, 2011.
14. “Lectures on Fractional Quantum Hall Effect”, 8-Hour Lecture Series at APCTP, Pohang, October 5-19, 2010.
15. “Quantum Entanglement of the Moore-Read Quantum Hall State”, 2-Hour Lecture at the Summer School on Quantum Condensation, Hsinchu, August 20, 2010.
16. “From Quantum Hall Effect to Quantum Computation”, 5-Hour Lecture Series at the INSTANS Summer School, Benasque, Spain, June 21 - July 2, 2010.

#### **INVITED SEMINARS AND COLLOQUIA**

1. “Machine Learning the Quantum Hall Effect”, Seminar, International Center for Quantum Materials, Peking University, December 13, 2019.
2. “Machine Learning the Quantum Hall Effect”, Fudan Physics Friday Seminar, Fudan University, October 19, 2018.
3. “Exotic Phases and Phase Transitions”, Colloquium at the Interdisciplinary Center for Theoretical Physics, University of Science and Technology of China, October 28, 2016.

4. “Exotic Phases and Phase Transitions”, Colloquium at the Institute of Condensed Matter, Chongqing University, October 19, 2016.
5. “Dances with Two-Dimensional Electrons”, 2016 Qiushi-West Lake Forum, Peking University, October 14, 2016.
6. “Selected Topics in Anisotropic 2D Systems”, Seminar, Fudan University, September 26, 2016.
7. “Random walk down quantum braids”, APCTP Visitor Seminar, Asia Pacific Center for Theoretical Physics, August 12, 2016.
8. “Topological Quantum Computation in Solid State Systems”, The Forum on Condensed Matter Physics, Peking University, May 5, 2016.
9. “Topological Phases, Edge Excitations, and Critical Theories: A Triangular Entanglement”, Center for Quantum Control, Fudan University, November 6, 2014.
10. “Anisotropic Quantum Hall States and Their Geometric Interpretation”, Physics Department Seminar, Indian Institute of Technology Madras, Chennai, India, September 5, 2014.
11. “Topology and Geometry of the Quantum Hall Effect”, IASTU Physics Seminars, Institute for Advanced Study, Tsinghua University, Beijing, December 19, 2012.
12. “A Geometrical Look of the Fractional Quantum Hall Effect”, Department Colloquium, POSTECH, Pohang, Korea, September 19, 2012.
13. “Randomness: From Doped Semiconductors to Topological Quantum Computing”, EE Seminar Series, Princeton University, Princeton, New Jersey, USA, July 10, 2012.
14. “Geometrical Aspects of Fractional Quantum Hall Effect”, Weekly Seminar Series, International Center for Quantum Materials, Peking University, Beijing, April 9, 2012.
15. “Recent Progress in Clustered Fractional Quantum Hall Systems”, Institute of Physics, Chinese Academy of Sciences, Beijing, May 19, 2011.
16. “Interference of Quasiparticles with a Fraction of an Electron Charge”, Physics Department Colloquium, KAIST, Daejeon, Korea, December 7, 2009.
17. “Topological Quantum Computation in a Nutshell”, University Anniversary Colloquium, East China Normal University, Shanghai, October 14, 2009.
18. “Quasiparticle Interference in  $\nu = 5/2$  Fractional Quantum Hall Systems”, Institute for Theoretical Condensed Matter Physics, Karlsruhe Institute of Technology, Karlsruhe, Germany, July 6, 2009.
19. “A Brief Introduction to Topological Quantum Computation”, Physics Department Colloquium, Yonsei University, Seoul, Korea, March 25, 2009.
20. “Search for Non-Abelian Quasiparticles in Fractional Quantum Hall Liquids”, National Center for Theoretical Sciences, Hsinchu, February 20, 2009.

21. “Improve Braid Construction for Topological Quantum Computation”, Academia Sinica, Taipei, February 19, 2009.
22. “Braid Construction for Low-Leakage Topological Quantum Computation”, SISSA, Trieste, Italy, November 24, 2008.
23. “The Fractional Quantum Hall State at Filling Fraction  $5/2$ ”, KAIST, Daejeon, Korea, October 16, 2008.
24. “Interference in the Moore-Read State”, Institute of Physics, Chinese Academy of Sciences, Beijing, September 13, 2008.
25. “Moore-Read Quantum Hall State and the Detection of Non-Abelian Quasiparticles”, Lectures at the Summer School on Strongly Correlated Electron Systems, Korea Institute for Advanced Study, Seoul, Korea, July 21-23, 2008.
26. “Topological Quantum Computing in Fractional Quantum Hall States”, Chern Institute of Mathematics, Naikai University, Tianjin, April 22, 2008.
27. “Topological Quantum Computation in Two-Dimensional Electron Systems”, POSTECH, Pohang, March 17, 2008.
28. “Edge Excitations and Non-Abelian Statistics in the Moore-Read State and the Connection to Topological Quantum Computation”, University of Hong Kong, Hong Kong, April 23, 2007.
29. “Exotic Quantum Phases and Topological Quantum Computation”, Chern Institute of Mathematics, Nankai University, Tianjin, Nov. 29, 2006.
30. “From Quantum Hall Effects to Topological Quantum Computation”, Center for Advanced Study, Tsinghua University, Beijing, May 25, 2006.
31. “Disordered Systems with Broad Energy Scales”, Institute of Condensed Matter Theory, University of Karlsruhe, Karlsruhe, Germany, January 23, 2006.
32. “Topological Orders and Edge Tunneling in Fractional Quantum Hall Liquids”, Institute of Condensed Matter Theory, University of Karlsruhe, Karlsruhe, Germany, January 2004.
33. “Mobility Gap, Edge Tunneling and Edge Reconstruction of Fractional Quantum Hall Liquids”, Fudan University, Shanghai, December 2003.
34. “Mobility Gap, Edge Tunneling and Edge Reconstruction of Fractional Quantum Hall Liquids”, Zhejiang University, Hangzhou, December 2003.
35. “Mobility Gap, Edge Tunneling and Edge Reconstruction of Fractional Quantum Hall Liquids”, Nanjing University, Nanjing, January 2004.
36. “Reconstruction of Fractional Quantum Hall Edges”, University of Karlsruhe, Karlsruhe, Germany, October 2002.

37. “Reconstruction of Fractional Quantum Hall Edges”, University of Tübingen, Tübingen, Germany, October 2002.
38. “Reconstruction of Fractional Quantum Hall Edges”, University of Saarland, Saarbrücken, Germany, October 2002.
39. “Monte Carlo Simulation of Doped, Diluted Magnetic Semiconductors”, Condensed Matter Theory seminar, National High Magnetic Field Laboratory, Tallahassee, Florida, USA, October 2000.
40. “Monte Carlo Simulations of Random Systems with Multiple Energy Scales”, Computational Research in Princeton Seminar, Princeton University, Princeton, New Jersey, USA, October 1999.

## PUBLICATIONS

1. Bo Yang, Na Jiang, Xin Wan, Jie Wang, and Zi-Xiang Hu, Edge Induced Topological Phase Transition of the Quantum Hall state at Half Filling, arXiv:1901.00046, Phys. Rev. B 99, 161108(R) (2019).
2. Zhenyu Li, Mingxing Luo, and Xin Wan, Extracting Critical Exponent by Finite-Size Scaling with Convolutional Neural Networks, arXiv:1711.04252, Phys. Rev. B 99, 075418 (2019).
3. Qiong Zhu, Peng Wu, R. N. Bhatt, and Xin Wan, Localization length exponent in two models of quantum Hall plateau transitions, arXiv:1804.00398, Phys. Rev. B 99, 024205 (2019).
4. Na Jiang and Xin Wan, Recent Progress on the Non-Abelian  $\nu = 5/2$  Quantum Hall State, AAPS Bull. 29 (1), 58 (2019).
5. Wen-Jia Rao, Zhenyu Li, Qiong Zhu, Mingxing Luo, and Xin Wan, Identifying Product Order with Restricted Boltzmann Machines, arXiv:1709.02597, Phys. Rev. B 97, 094207 (2018).
6. Qi Li, Na Jiang, Xin Wan, and Zi-Xiang Hu, Scaling analysis of the quasiparticle tunneling in the  $Z_k$  parafermion states, arXiv:1512.06329, J. Phys.: Condens. Matter 30, 255601 (2018).
7. Xin Wan and Kun Yang, Striped quantum Hall state in a half-filled Landau level, arXiv:1509.01780, Phys. Rev. B 93, 201303(R) (2016).
8. Min Lu, Wenjia Rao, Rajesh Narayanan, Xin Wan, and Guang-Ming Zhang, Emergent infinite-randomness fixed points from the extensive random bipartitions of the spin-1 Affleck-Kennedy-Lieb-Tasaki topological state, arXiv:1502.02095, Phys. Rev. B 94, 214427 (2016).
9. Ming-Chiang Chung, Yi-Hao Jhu, Pochung Chen, Chung-Yu Mou, and Xin Wan, A Memory of Majorana Fermions through Quantum Quench, arXiv:1401.0433, Sci. Rep. 6, 29172 (2016).
10. Wen-Jia Rao, Kang Cai, Xin Wan, and Guang-Ming Zhang, Emergent quantum criticality from fractionalizing one-dimensional  $SO(5)$  symmetric valence-bond solid states, Phys. Rev. B 92, 214430 (2015).
11. Qiong Zhu, Xin Wan, Rajesh Narayanan, Jose A. Hoyos, Thomas Vojta, Emerging criticality in the disordered three-color Ashkin-Teller model, arXiv:1504.00408, Phys. Rev. B 91, 224201 (2015).
12. Qiong Zhu, Xin Wan, and Guang-Ming Zhang, Topologically distinct critical theories emerging from the bulk entanglement spectrum of integer quantum Hall states on a lattice, arXiv:1409.4916, Phys. Rev. B 90, 235134 (2014).

13. Wen-Jia Rao, Xin Wan, and Guang-Ming Zhang, Critical entanglement spectrum of one-dimensional symmetry protected topological phases, arXiv:1406.7113, Phys. Rev. B. 90, 075151 (2014).
14. Ki Hoon Lee, Zi-Xiang Hu, and Xin Wan, Construction of the edge states in fractional quantum Hall systems by Jack polynomial, arXiv:1401.4673, Phys. Rev. B 89, 165124 (2014).
15. Rui-Zhi Qiu, Zi-Xiang Hu, and Xin Wan, Single-mode approximation for rotational symmetry broken quantum Hall states, arXiv:1304.2856, Phys. Rev. B 88, 235118 (2013).
16. Xin Wan, Zhenghan Wang, and Kun Yang, From the fractional quantum Hall effect to topological quantum computation (A topical review in Chinese), Physics (Beijing) 42 (8), 04 (2013).
17. Hao Wang, R. Narayanan, Xin Wan, and Fuchun Zhang, Fractional quantum Hall states in two-dimensional electron systems with anisotropic interactions, arXiv:1203.1982, Phys. Rev. B 86, 035122 (2012).
18. Zi-Xiang Hu, Ki Hoon Lee, and Xin Wan, Bulk and edge quasihole tunneling amplitudes in the Laughlin state, arXiv:1201.2105, Int. J. Mod. Phys. Conf. Ser. 11, 70 (2012), presented at Localisation 2011 as an invited talk.
19. Rui-Zhi Qiu, F. D. M. Haldane, Xin Wan, Kun Yang, and Su Yi, Model anisotropic quantum Hall states, arXiv:1201.1983, Phys. Rev. B 85, 115308 (2012) [PRB Editors' Suggestion].
20. Zi-Xiang Hu, R. N. Bhatt, Xin Wan, and Kun Yang, Realizing universal edge properties in graphene fractional quantum Hall liquids, arXiv:1109.5994, Phys. Rev. Lett. 107, 236806 (2011) [PRL Editors' Suggestion].
21. Rui-Zhi Qiu, Su-Peng Kou, Zi-Xiang Hu, Xin Wan, and Su Yi, Quantum Hall Effects in Fast Rotating Fermi Gases with Anisotropic Dipolar Interaction, arXiv:1104.0100, Phys. Rev. A 83, 063633 (2011).
22. Zi-Xiang Hu, Ki Hoon Lee, E. H. Rezayi, Xin Wan, and Kun Yang, Scaling and Non-Abelian Signature in Fractional Quantum Hall Quasiparticle Tunneling Amplitude, arXiv:1011.4716, New J. Phys. 13, 035020 (2011) [Focus on Topological Quantum Computation].
23. Michele Burrello, Giuseppe Mussardo, and Xin Wan, Topological Quantum Gate Construction by Iterative Pseudogroup Hashing, arXiv:1009.5808, New J. Phys. 13, 025023 (2011) [Focus on Topological Quantum Computation].
24. Michele Burrello, Haitan Xu, Giuseppe Mussardo, and Xin Wan, Topological Quantum Hashing with the Icosahedral Group, arXiv:0903.1497, Phys. Rev. Lett. 104, 160502 (2010).

25. Zi-Xiang Hu, E. H. Rezayi, Xin Wan, and Kun Yang, Edge-mode Velocities and Thermal Coherence of Quantum Hall Interferometers, arXiv:0908.3563, Phys. Rev. B 80, 235330 (2009).
26. Hua Chen, Zi-Xiang Hu, Kun Yang, E. H. Rezayi, and Xin Wan, Quasiparticle Tunneling in the Moore-Read Fractional Quantum Hall State, arXiv:0905.3607, Phys. Rev. B 80, 235305 (2009).
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