Curriculum Vitae of Congjun Wu

RESEARCH AREA

My research is on the study of **new states of matter** and their **organizing principles** in condensed matter and cold atom systems. It includes superconductivity, magnetism, orbital physics, topological states, strongly correlated cold atom systems, and quantum Monte-Carlo simulations.

EDUCATION

- Ph. D. in Physics, Stanford University, Jun. 2002 - Sept. 2005.
  Advisor: Prof. Shou-Cheng Zhang (deceased).
- University of Illinois at Urbana-Champaign, May 2000 - May 2002.
  Advisor: Prof. Eduardo H. Fradkin.
- M.S. in Physics, Peking University, Beijing, China, Sept. 1997 - Jun. 2000.
  Advisor: Prof. Zhao-Bin Su.
- B.S. in Physics, Tsinghua University, Beijing, China, Sept. 1992 - Jul. 1997.

EMPLOYMENT

Mar. 2021 -	Chair Professor, Department of Physics, School of Science, Westlake University, Hangzhou, China
Jul. 2017- Mar. 2021	Professor, Department of Physics, University of California, San Diego (UCSD)
Jul. 2011- Jun. 2017	Associate Professor, Department of Physics, UCSD.
Jul. 2007- Jun. 2011	Assistant Professor, Department of Physics, UCSD.
Aug. 2005- Jun. 2007	Postdoctoral Research Associate, Kavli Institute for Theoretical Physics, University of California, Santa Barbara.

HONORS and AWARDS

- New Cornerstone Investigator (the inaugural award), 2023-2027.
- American Physical Society (**APS**) Fellowship, nominated by Division of Condensed Matter Physics, APS (2018).
  Citation: "For research in helical edge liquids of topological insulators, itinerant magnetism, novel states of matter including cold fermions with high symmetries, orbital physics in optical lattices, spin-orbit coupled Bose-Einstein condensates, and for work on the quantum Monte-Carlo sign problem".
- Air Force Office of Scientific Research (AFOSR), Young Investigator Award, 2011-2014.
- Alfred P. Sloan Research Fellowship, 2008.
- *"Outstanding Young Researcher Award"* of Overseas Chinese Physics Association, 2008.
- The most influential paper award from Chinese Physics Society 2013 for *"Wu, Mondragon-Shem, and Zhou, Chin. Phys. Lett. 28, 086104 (2011)"* (This paper is one of two earliest works theoretically studying spin-orbit coupled BEC").

CITATION RECORDS

- Web of Science: Total citations **7915**, **H-index:** 46
- Researcher ID: http://www.researcherid.com/rid/L-1750-2015
- Google Scholar: https://scholar.google.com/citations?user=RVhTP8oAAAAJ&hl=en
  Total citations **11632**.

PH. D. STUDENTS CULTIVATED

1. Dr. Yi Li, Ph.D. 2013.
   She is currently an Assistant Professor at **Johns Hopkins University** since 07/2016. She was awarded the Sloan Research Fellowship in 2018, and the NSF Career Award in 2019.
   She did postdoctoral research at **Princeton Center of Theoretical Sciences** from 07/2013 to 06/2016.
2. Dr. Shenglong Xu, Ph. D. 2016.
   He is currently an Assistant Professor from Department of Physics, **Texas A&M University** since 2023. He was a postdoctoral researcher at **University of Maryland** from 09/2016 - 12/2019.
3. Dr. Wang Yang, Ph. D. 2017.
   Currently he is an Associate professor at School of Physics, Nankai University 2023. He was a postdoctoral researcher at **University of British Columbia**, working with Prof. Ian Affleck.
4. Dr. Hsiang-Hsuan Hung, Ph. D. 2011.
   He did postdoctoral research at **UIUC** and **UT, Austin**, and is currently in industry.

POSTDOCTORAL RESEARCHERS SUPERVISED

1. Dr. Wei-cheng Lee (08/2008-08/2010), Ph. D 2008 from UT Austin.
   He is currently an Associate Professor at **Binghamton University, SUNY**.
2. Dr. Zi Cai (09/2010–08/2012), Ph.D 2010 from Institute of Physics, Chinese Academy of Sciences. He is currently an Associate Professor **Shanghai Jiaotong University** since 2022, and an Asistant Professor from 2016-2022.
3. Dr. Da Wang (09/2012–08/2014), Ph. D. 2012 from Nanjing University. He has been an Associate Professor at **Nanjing University**, China since 2015.
4. Dr. Jianda Wu (09/2014–08/2017), Ph. D 2014 from Rice University. He has been an Associate Professor at **T. D. Lee Insitute, Shanghai Jiaotong University**, China since 2018.
5. Dr. Lunhui Hu (09/2018 –04/2020), Ph. D. 2018 from Zhejiang University. He has been an Assistant Professor of **Zhejiang University** since 2024.
6. Dr. Chen Lu (09/2022 –09/2024), Ph. D. 2020 from Beijing Institute of Technology. He will join **Hangzhou Normal University** as an Associate Professor in 2024.
7. Dr. Zhiming Pan (09/2021 –09/2024), Ph. D. 2021 from Peking University. He will join **Xiamen University** as an Associate Professor in 2024.

CAREER SIGNIFICANT PUBLICATIONS

1. Chen Lu, Zhiming Pan, Fan Yang, Congjun Wu *"Interlayer-coupling-driven high-temperature superconductivity in La3Ni2O7 under pressure"*, Phys. Rev. Lett. **132**, 146002 (2024).
   The **link**: https://doi.org/10.1103/PhysRevLett.132.146002
2. Shenglong Xu, Congjun Wu, *"Space-time crystal and space-time group*, Phys. Rev. Lett. **120**, 096401 (2018).
   The **link**: https://doi.org/10.1103/PhysRevLett.120.096401
3. Zhong-chao Wei, Congjun Wu, Yi Li, Shi-Wei Zhang, Tao Xiang, *"Majorana Positivity and the Fermion sign problem of Quantum Monte Carlo Simulations"*, Phys. Rev. Lett. **116**, 250601 (2016).
   The **link**: https://doi.org/10.1103/PhysRevLett.116.250601
4. Shenglong Xu, Yi Li, Congjun Wu, *"Sign-Problem-Free Quantum Monte Carlo Study on Thermodynamic Properties and Magnetic Phase Transitions in Orbital-Active Itinerant Ferromagnets"*, Phys. Rev. X **5**, 021032, (2015).
   The **link**: https://doi.org/10.1103/PhysRevX.5.021032
5. Yi Li, E. H. Lieb, Congjun Wu, "Exact Results on Itinerant Ferromagnetism in Multi-orbital Systems on Square and Cubic Lattices", Phys. Rev. Lett. **112**, 217201 (2014).

The **link**: https://doi.org/10.1103/PhysRevLett.112.217201

6. Yi Li, Congjun Wu, "High-Dimensional Topological Insulators with Quaternionic Analytic Landau Levels", Phys. Rev. Lett. **110**, 216802 (2013).
   The **link**: https://doi.org/10.1103/PhysRevLett.110.216802
7. Congjun Wu, Doron Bergman, Leon Balents, and S. Das Sarma, "Flat bands and Wigner crystallization in the honeycomb optical lattice", Phys. Rev. Lett. **99**, 70401 (2007).
   Times Cited: 439. The **link**: https://doi.org/10.1103/PhysRevLett.99.070401
8. Congjun Wu, B. Andrei Bernevig, and Shou-Cheng Zhang, "*The helical liquid and the edge of quantum spin Hall systems*", Phys. Rev. Lett. **96**, 106401(2006).
   Times Cited 650. The **link**: https://doi.org/10.1103/PhysRevLett.96.106401
9. Congjun Wu, Jiangping Hu, and Shou-Cheng Zhang, "*Exact SO(5) symmetry in spin 3/2 fermionic systems*", Phys. Rev. Lett. **91** , 186402 (2003).
   Times Cited 275. The **link**: https://doi.org/10.1103/PhysRevLett.91.186402
10. **Congjun Wu** and Shou-Cheng Zhang, *"Dynamic generation of spin-orbit coupling"*, Phys. Rev. Lett. **93**, 36403 (2004).
    The **link**: https://doi.org/10.1103/PhysRevLett.93.036403
11. Congjun Wu, Ian Mondragon Shem, and Xiang-Fa Zhou, *"Unconventional Bose-Einstein condensations from spin-orbit coupling"* , Chin. Phys. Lett. 28, 097102 (2011) (arXiv:0809.3532)
    Times Cited 294. The **link**: http://stacks.iop.org/0256-307X/28/i=9/a=097102

SCIENTIFIC DUTIES

- Serve in the Editorial Broad for *"Science China Physics, Mechanics & Astronomy"* since 2023.
- Serve in the Editorial Broad for *"Physics(Wuli)", Chinese Physical Society* since 2023.
- Serve in the Editorial Broad for *"Chinese Physics Letters"* from 2015 -2020.
- Proposal Reviewer for National Science Foundation of China, U. S. National Science Foundation, Division of Materials Research and Division of Physics; U. S. Army Research Office; U.S. Air Force Office of Scientific Research; Research Grants Council of Hong Kong; the Foundation for Fundamental Research on Matter, the physics research council in the Netherlands.
- Referee for *Nature*; *Nature Physics*, *Physical Review Letters*, *Physical Review A*, and *Physical Review B*; *Nuclear Physics B*; *Physics Letters A*; *Europhysics Letters*.

PHYSICS COLLOQUIA (20)

1. Department of Physics, **Fudan University**, *"Symmetry and Correlation Aspects of Quantum Dynamics"*, Nov. 28, 2023.
2. The 412th Zhongguancun Forum, **Institute of Physics**, *"Multi-particle clustering physics"*, May 29, 2023.
3. Department of Physics, **Xiamen University**, *"Novel Orbital Physics – Unconventional BEC, Ferromagnetism in optical lattices"*, April 27, 2023.
4. Department of Physics, **Southern University of Science and Technology**, *"Novel Orbital Physics – Unconventional BEC, Ferromagnetism in optical lattices"*, March 09, 2023.
5. Department of Physics, **Fudan University**, *"Unification of orbital active honeycomb material"*, Oct. 24, 2021.
6. University Colloquium, **Hunan University**, online talk, *"Electron sociology - an Introduction to Condensed Matter Physics"*, Nov. 12, 2020.
7. Online talk organized by **Editorial Board of Frontiers of Physics**, *"Unification of orbital active honeycomb material"*, Aug. 5, 2020.
8. T. D. Lee Institute, **Shanghai Jiaotong University**, *"Interaction and Correlation Aspects of Ferromagnetism"*, July 7, 2020.
9. Department of Physics, **University of California, San Diego**, *"Symmetry and Correlation As-*

pect of Quantum Dynamics", April 18, 2019.

10. Department of Physics, **Simon Fraser University**, *"Novel orbital physics – Unconventional BEC and Curie-Weiss Metal states in optical lattices"*, Nov. 17, 2017.
11. Department of Physics, **University of British Columbia**, *"Novel orbital physics – Unconventional BEC and Curie-Weiss Metal states in optical lattices"*, Nov. 16, 2017.
12. Department of Physics, **University of California, San Diego**, *"Novel orbital physics – Unconventional BEC and Curie-Weiss Metal states in optical lattices"*, Nov. 9, 2017.
13. Center for Nonlinear Studies, **Los Alamos National Lab**, Condensed Matter Science Colloquium, "*Novel orbital phases in optical lattices – unconventional BEC and itinerant ferromagnetism*", Dec. 14, 2016.
14. Department of Physics, **Huazhong University of Science & Technology**, Physics Colloquia, "*New progress on itinerant ferromagnetism and the Curie-Weiss Metal State*", Jun 23, 2016.
15. Department of Physics, **University of Texas at Dallas**, Physics Colloquia, "*Unconventional orbital phases with cold atoms* ", Sept, 2015.
16. Department of Physics, **Tulan University**, Physics Colloquia, "*Exact results on itinerant ferromagnetism*", Oct 22, 2014.
17. Department of Physics, **University of Houston**, Physics Colloquia, "*Unconventional metamagnetism and orbital ordering in transition metal oxides* ", March 27, 2012.
18. Institut fur Laserphysik, **University of Hamburg**, Germany, Unconventional Bose-Einstein condensation beyond the no-node paradigm", Jan. 31, 2012.
19. Department of Physics, **Washington State University**, Physics Colloquia, "*Orbital Phases of cold atoms: unconventional BEC, ferromagnetism, and unconventional Cooper pairing*", Nov. 17, 2009.
20. Department of Physics, **Washington University in St. Louis**, Physics Colloquia, "*Unconventional magnetism and dynamic generation of spin-orbit coupling*", Jan. 17, 2007.

INVITED CONFERENCE TALKS (54)

21. **"101 Project, statistical mechanics"** , *"Frustrated superfluidity and sextteting order"*, Xiamen Aug 12th, 2024.
22. **The 8th Quantum Information, space-time, and topological states**, *"Quaternion, harmonic oscillator and high dimensional topological states"*, Dalian Aug 3rd, 2024.
23. **The Great Bay Quantum Science Forum** , *"Multi-fermion clustering instability "*, Shenzhen, July 25, 2024.
24. **2024 Zhejiang Workshop on Correlated Matter**, *"Unconventional magnetism and altermagnetism"*, Zhejiang University, May 10, 2024.
25. **Forum of Innovation**, *"Unconventional magnetism and altermagnetism"*, Suzhou University, May 10, 2024.
26. **The fifth Peng Huanwu theoretical physics forum**, *"Quaternion, harmonic oscillator and high dimensional topological states"*, ITP, Beijing, Jan 25, 2024.
27. **International Conference on Ultra-cold atomic gases: 30 years of activities and looking forward**, *"Novel Orbital Physics in Optical Lattices: Unconventional BEC and Curie-Weiss Metal"*, University of Hong Kong, Dec 6, 2023.
28. **Workshop for Topological Quantum Materials and Information**, *"Novel triplet and septet Cooper pairings"*, Shanghai Tech University, Nov 29,2023.
29. **Workshop for Topological Materials**, *"Symmetry constraints on Josephson diode"*, Fudan University, Nov 28, 2023.
30. **International Conference on Nickelate Superconductivity**, *"Inter-layer driven high Tc superconductivity in La3Ni2O7"* , Sun Yat-sen University, Nov 19, 2023.
31. **"Asia-Pacific Workshop on Strongly Correlated Systems 2023"**, *"Fermion clustering insta-*

bility", Sept 24, 2023.

32. **Nan'ao Conference on Photo-electric physics**, *"Unconventional Bose-Einstein Condensation"*, Nan'ao, Sept 9, 2023.
33. **Fall meeting of Chinese Physical Society**, *"Multi-particle clustering physics"* , Yinchuan, Aug 20, 2023.
34. **The 2023 International Workshop on Frontiers of Theoretical and Computational Physics and Chemistry**, *"Fermion Positivity and Quantum Monte-Carlo Studies to Strong Correlation Physics",* Lanzhou University, Aug 16, 2023.
35. **The 11th Workshop on Quantum Many-Body Computation**, "Novel States of Matter with Ultra-Cold Multi-component Bosons and Fermions", Fuzhou Workshop, 04/13/2023.
36. **Workshop for Topological Quantum Materials and Information**, *"Frustrated superconductivity and superfluidity"*, Shanghai Tech University, Dec 14,2022.
37. **Kavli Institute Workshop on Magnetism, Superconductivity, Topology**, "Frustrated superconductivity and superfluidity", Songsan Lake, Dongguan, 11/05/2022.
38. Youth Forum of Quantum Magnetism, "Frustrated orbital exchange and orbital ice", online participation, 10/10/2022.
39. **Low temperature physics conference of China**, "Quatertting (charge 4e) instability", participation online, 07/07/2022.
40. **Workshop on SU(N) physics in condensed matter and cold atoms**, *"Exploring Sp(N) and SU(N) symmetries"*, participation online, Osaka University, 05/09/2022
41. **Workshop for Topological Quantum Materials and Information**, "Time-Reversal Symmetry Breaking Pairing in Iron-Chalcogenide Superconductors", ShanghaiTech University, Nov. 25, 2021.
42. **International Workshop: New Frontiers in Extremely Strongly Interacting Quantum Matter: Transport dynamics, quantum hydrodynamics and Topological matter**, "Space-time Group and Dynamic Crystal", T. D. Lee Institute, Shanghai Jiaotong University, July 19, 2021.
43. **Physical Review workshop on Quantum Materials for Modern Magnetism & Spintronics**, *"Unification of orbital active honeycomb material"*, USTC, Hefei, July 14, 2021.
44. **Low Temperature Physics Conference of China**, *"Mott Physics of SU(N) Hubbard models"* Jinhua, June 04, 2021.
45. **Zhejiang Conference for strong correlation physics**, "Non-perturbative studies on strong-correlation physics", Nov. 28, 2020.
46. **Emergent phenomena in ultracold atoms: topology, interaction, and dynamics** at Kavli Institute for Theoretical Science, Beijing, *"Symmetry and Correlation Aspect of Quantum Dynamics"*, June 13 2019, invited talk.
47. **Memorial workshop for Shoucheng Zhang** at Tsinghua University, "Quarternionic analyticity and high dimensional topological matter", June 10 2019, invited talk.
48. **Memorial workshop for Shoucheng Zhang** at Stanford University, "Application of the symmetry principle in condensed matter physics", May 4, 2019, invited talk.
49. **Workshop for Topological Quantum Information** at Shanghai Tech University, "Orbital-active honeycomb material", Shanghai, Nov 19-20, invited talk.
50. **12th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors**, "Spin-3/2 topological superconductivity beyond triplet pairing", Beijing, Aug 19-24, 2018, invited talk.
51. **AFOSR Program Review**, "*Quantum dynamics: Spact-time Crystal and Bethe String states"*, Arlington, Jun 18-22.
52. **2018 International Conference on Emergent Phenomena in Quantum Materials**, "*Progress on Itinerant Electrons: Cruie-Weiss metal and Spin-orbit ordering*", New York University in Shanghai, May 30 - Jun 1.

53. **"Quantum material workshop"**, Fudan University, "*Quantum dynamics: Spact-time Crystal and Bethe String states"*, Shanghai, April 20 -22, 2018.
54. **"Sign 2017, International workshop in the sign problem in QCD and beyond"**, "Fermion positivity and sign problem", University of Washington, Seattle, March 2017.
55. **The 2nd Condensed Matter Conference**, Chinese Physics Society, the symposium on many-body physics, "Quantum dynamics of the XXZ spin chain in a longitudinal magnetic field", Nanjing, July 2016.
56. **The first Condensed Matter Conference**, Chinese Physics Society, "Topological and strongly correlation physics in the p_x, p_y orbital bands in the honeycomb lattice – from solid states to optical lattices", Beijing, July 17, 2015.
57. **Topological and Strongly Correlated Phases in Cold Atoms**, "Topological and strongly correlation physics in the p_x, p_y orbital bands in the honeycomb lattice – from solid states to optical lattices", Princeton Center for Theoretical Sciences, April 30, 2015.
58. **The Topology and Mathematical Physics conference**, "Quaternion analyticity and 3D SU(2) Landau levels", Center of Mathematical Sciences and Applications, Harvard University, Sept 17, 2014.
59. **The Quantum Gas Conference**, "Novel Sp(2N)/SU(2N) quantum magnetism and Mott physics – large spin is different", Center of Advanced Study, Tsinghua University, Aug 26, 2014.
60. **The Chengdu Condensed Matter Conference** "Topological and strongly correlated physics in the p_x/p_y-orbital bands of the honeycomb lattice-from solid states to optical lattices", Chengdu, China, July 14, 2014.
61. **The 6th International Symposium on Cold Atom Physics**, "Quaternionic states of matter from synthetic gauge fields", Taiyuan, China, Jun 16, 2014.
62. **The 7th Cross-Strait and International Conference on Quantum Manipulation**, title TBA, Institute of Physics, Chinese Academy of Sciences, Beijing, June 28- 30, 2013.
63. **International workshop on Orbital Physics in Cold Atom Systems**, "Novel states of matter of ultra-cold atoms in high bands in optical lattices", Institute of Physics, Chinese Academy of Sciences, Beijing, Jan.5-6, 2013.
64. **2012 Energy, Materials and Nanotechnology (EMN) Meeting**, the parallel session of topological insulators, *"Isotropic Landau Levels of Relativistic and Non-Relativistic Fermions in 3D Flat Space"*, April 16-20, Orlando, Florida, 2012.
65. **The 26th International Conference on Low Temperature Physics**, the parallel session of quantum gases, *"Hidden symmetries and exotic quantum magnetism of large-spin alkali and alkaline-earth fermions"*, Aug 12, Beijing, 2011.
66. **Physics Driven by Spin-orbital Coupling in Transition Metal Compounds**, *"New developments of p-orbital physics – unconventional BEC and fermionic insulators"*, Institute of Physics, Chinese Academy of Sciences, Jun 20-22, Beijing, China, 2011.
67. **Future and Prospect of Topological Insulator**, "*Topological orbital states with cold atoms"*, Institute of Physics, Chinese Academy of Sciences, July 5 to July 10, Beijing and Weihai, China, 2010.
68. **Exotic Insulating Phases of Matter**, The Johns Hopkins University, "*Topological orbital states with cold atoms"*, Jan. 14-16, 2010.
69. **Canadian Institute for Advanced Research, Cold Atoms Meeting**, Halifax, Canada "*Novel orbital physics with fermions in optical lattices*, August 12-16, 2009.
70. **American Physical Society March Meeting 2009**, Pittsburgh, PA, "*Novel orbital physics with fermions in optical lattices*, Mar. 20, 2009.
71. **New Directions in Low-Dimensional Electron Systems (Conference)**, Kavli Institute for Theoretical Physics, University of California, Santa Barbara, Feb 23, 2009.
72. **The 39th Winter Colloquium on the PHYSICS OF QUANTUM ELECTRONICS**, "*Novel*

orbital physics with fermions in optical lattices. Jan. 8, 2009.

73. **Academic conference for the 80-year anniversary of Institute of Physics, Chinese Academy of Sciences**, Beijing, "*Novel Orbital Physics with Cold Atoms in Optical Lattices"*, Jun. 20, 2008.
74. Department of Physics, University of Maryland, **Condensed Matter Theory Center Symposium**, "*Pomeranchuk instability and dynamic generation of spin-orbit coupling*", Nov. 8, 2006.

INVITED CONDENSED MATTER SEMINAR TALKS (92)

75. Department of Physics, **Tsinghua University** , *"Multi-fermion clustering instability "*, March 28, 2024.
76. Department of Physics, **University of Hong Kong**, *"Symmetry and Correlation Aspects of Quantum Dynamics"*, Dec 6, 2023.
77. Institute for Advanced Studies, **Tsingha University**, *"Symmetry and Correlation Aspects of Quantum Dynamics"*, Nov 1, 2023.
78. International Center for Quantum Materials, **Peking University**, "Symmetry unification of orbital active honeycomb materials", Oct 24, 2023.
79. Department of Physics, **Huazhong Univ. of Science and Technology**, "Multi-particle clustering physics", May 07, 2023.
80. Department of Physics, **Tianjin University**, Space-time group and dynamic crystal, participation online, Dec 02, 2022.
81. Department of Physics, **Renmin Univ**, "Locality and itineracy from Hubbard models", participation online, May 17, 2022.
82. Department of Physics, **Peking University**, "Time-reversal symmetry breaking pairing in iron-chalcogenide superconductors", Nov 24, 2021.
83. ICQD Monthly Seminar Series, **USTC**, "Unconventional Magnetism and Spontaneous Spin-orbit Ordering", Nov. 19, 2021.
84. Department of Physics, **Rice University**, "Time-reversal symmetry breaking pairing in iron-chalcogenide superconductors", Feb 3, 2021.
85. Beijing International Center for Mathematical Research, **Peking University**, "Quanternion, Harmonic Oscillator, and High dimensional Topological States", Oct. 16, 2020.
86. Department of Physics, **Shanghai-Tech University**, *"Interaction and Correlation Aspects of Ferromagnetism"*, July 7, 2020.
87. Department of Physics, **University of California, San Diego**, *"Unification of orbital-active honeycomb materials"*, Nov. 27, 2019.
88. Department of Physics, **University of Chicago**, *"Symmetry and Correlation Aspect of Quantum Dynamics"*, May 28, 2019.
89. Department of Physics, **University of California, Berkeley**, "*Orbital-active Honeycomb Materials"*, April 30, 2019.
90. Westlake University, Hangzhou, China, "*Quantum Dynamics – Space-time group and Bethe String states"*, Nov. 23, 2018.
91. Department of Physics, **University of Buffalo**, SUNY, "*Quantum Dynamics – Space-time group and Bethe String states"*, Sept 18, 2018.
92. **Institute of Physics**, Chinese Academy of Sciences, "*Topological superconductivity with spin-$\frac{3}{2}$ half-Heusler semi-metal beyond triplet pairing"*, Sept. 7, 2018.
93. **Wuhan Institute of Physics and Mathematics**, Chinese Academy of Sciences, "*Quantum Dynamics – Space-time group and Bethe String states"*, Sept. 7, 2018.
94. **Chern Institute of Mathematics**, Nanka University, "*Quantum Dynamics – Space-time group and Bethe String states"*, Aug 12, 2018.
95. **Department of Physics**, Tsinghua University, "*Large gap 2D topological insuator"*, Aug 15,

2018.

96. **Center for Advanced Studies**, Tsinghua University, "*Quantum Dynamics -Space-time crystal and Bethe String states*", Aug 9, 2018.
97. Center for Quantum Materials, **Peking University**, "*Quantum Dynamics - Space-time Crystal and Bethe String States"*, Aug 2,2018.
98. Department of Physics, **Shanghai University of Technology**, "*Quantum Dynamics - Space-time Crystal and Bethe String States"*, July 17, 2018.
99. Department of Physics, **Huazhong University of Science & Technology**, "*Quantum Dynamics -Space-time crystal and Bethe String states*", July 3, 2018.
100. Department of Physics, **Zhejiang University**, "*New development of itinerant electrons: Curie-Weiss metal and spin-orbit ordering*", June 7, 2018.
101. Department of Physics, Shanghai Jiaotong University, "*Topological superconductivity with spin-$\frac{3}{2}$ half-Heusler semi-metal beyond triplet pairing"*, June 4, 2018.
102. Center for Quantum Materials, **Peking University**, "*Topological superconductivity with spin-$\frac{3}{2}$ half-Heusler semi-metal beyond triplet pairing"*, Dec 21, 2017.
103. Department of Physics, **East China Normal University**, "*Novel orbital physics – unconventional BEC and Curie-Weiss Metal states in optical lattices*", Dec 15, 2017.
104. Department of Physics, **Fudan University**, "*Enhance topological gap in 2D materials to the scale of atomic spin-orbit coupling*", Dec 14, 2017.
105. Department of Physics, **Fudan University**, "*Unconventional magnetism and spontaneous spin-orbit ordering*, July 2017.
106. Department of Physics, **Beijing Normal University**, "*Unconventional magnetism and spontaneous spin-orbit ordering*, July, 2017.
107. **"Majorana flatband, magnetic domains, and Septet superconductivity"**, Majorana workshop, Shanghai Jiaotong University, Jun 2017.
108. Department of Physics, **Johns Hopkins University**, "*Unconventional magnetism and spontaneous spin-orbit ordering*, March 29, 2017.
109. Condensed Matter Theory Center, **University of Maryland**, "*Orbital phases in optical lattices and solids: unconventional BEC and large gap topological states*, March 28, 2017.
110. Department of Physics, **University of California, San Diego**, "*Unconventional magnetism and spontaneous spin-orbit ordering*, Jan, 2017.
111. Department of Physics, **Purdue University**, "*Unconventional orbital phases with cold atoms* ", March 03, 2016.
112. Department of Physics, **University of British Columbia**, "Novel Sp(2N)/SU(2N) quantum magnetism and Mott physics - large spins are different", Nov 16, 2015.
113. Department of Physics, **University of Washington**, "Topological and strong correlation physics in the px/py-orbital bands of the honeycomb lattice from solid states to optical lattices" April 1, 2015.
114. **INT workshop, University of Washington**, "Novel Sp(2N)/SU(2N) quantum magnetism and Mott physics - large spins are different", March 25, 2015.
115. **Institute of theoretical atomic, molecular and optical physics, Harvard**, "Topological and strongly correlation physics in the p_x, p_y orbital bands in the honeycomb lattice – from solid states to optical lattices" Nov 21, 2014.
116. Department of physics, **MIT**, "Topological and strongly correlation physics in the p_x, p_y orbital bands in the honeycomb lattice – from solid states to optical lattices", Nov 19, 2014.
117. Department of Physics, **Penn. State University**, "Topological and strongly correlation physics in the p_x/p_y orbital bands in the honeycomb lattice – from solid states to optical lattices", Nov. 4, 2014, scheduled.
118. Department of Physics, **Boston College**, "Novel Sp(2N)/SU(2N) quantum magnetism and Mott

physics – large spin is different", Oct. 15, 2014.

119. Department of Physics, **Harvard University**, "Quaternionic analytic Landau level in 3D", Oct 17, 2013.
120. Workshop for celebration Prof. Shou-cheng Zhang's 50 birthday, "Quaternionic BEC and Landau levels", March 23-25, 2013.
121. KITP workshop "Frustrated Magnetism and quantum spin liquids" "Power-law Correlated 2D SU(6) Quantum Paramagnets", Sept. 18, 2012.
122. Workshop on "Topological insulators and superconductors", "Unconventional magnetism in transition metal oxides", July, 2012.
123. Department of Physics, **UCSD**, "Quantum Monte-Carlo simulation of novel 2D quantum magnetism with power-law correlations", Nov 21, 2012.
124. Department of Physics, **The Florida State University**, "Isotropic Landau Levels of Relativistic and Non-Relativistic Fermions in 3D Flat Space", September 14, 2012.
125. Department of Physics, **University of British Columbia**, Canada, *"Isotropic Landau Levels of Relativistic and Non-Relativistic Fermions in 3D Flat Space"*, March 20, 2012.
126. Department of Physics, **University of California, Irvine**, "*Unconventional metamagnetism and orbital ordering in transition metal oxides* ", Feb 8, 2012.
127. Department of Physics, **Tsinghua University**, *"Unconventional Bose-Einstein condensation beyond the no-node paradigm"*, Aug 23, 2011.
128. Department of Physics, **University of Science and Technology of China**, "*Unconventional metamagnetic transition and orbital ordering in transition metal oxides*", July 29, 2010.
129. Key Lab of Quantum Information **University of Science and Technology of China**, "*Unconventional Bose-Einstein condensations beyond the no-node paradigm*", July 25, 2010.
130. Center for quantum information, **Tsinghua University**, *"Unconventional Bose-Einstein condensation beyond the no-node paradigm"*, July 19, 2011.
131. Department of Physics, **Wuhan University**, *"Unconventional metamagnetism and orbital ordering in transition metal oxides"*, July 5, 2011.
132. Department of Physics, **Wuhan University**, *"Novel p-orbital physics in optical lattices - unconventional BECs, exotic band and Mott insulators of fermions"*, July 4, 2011.
133. Center of Advanced Study, **Tsinghua University**, *"Novel orbital physics in the p-band"*, Jun. 28, 2011.
134. **Aspen physics workshop** "Few and many-body physics of cold quantum gases near resonances", Jun 16, 2011, *"Hidden symplectic symmetry in large spin ultra-cold fermion systems"*.
135. Department of Physics, **University of Texas, Austin**. March 3, 2011, '*Unconventional metamagnetic transition in the t_{2g} orbital system of $Sr_3Ru_2O_7$*.
136. Department of Physics, **Rice University**, "*Novel orbital physics with cold atoms – Unconventional BEC, Ferromagnetism, and f-wave Cooper pairing states*", Nov. 2, 2010.
137. **Institute of Physics, Chinese Academy of Sciences**, "*Unconventional metamagnetic transition in the t_{2g} orbital system of $Sr_3Ru_2O_7$*", Aug 17, 2010.
138. **Quantum simulation workshop**, Key Lab of Quantum Information University of Science and Technology of China, "*Unconventional metamagnetic transition in the t_{2g} orbital system of $Sr_3Ru_2O_7$*", July 30, 2010.
139. **Quantum simulation workshop**, Key Lab of Quantum Information University of Science and Technology of China, *"Hidden symmetries and quantum phases in large spin cold atom systems"*, July 29, 2010.
140. **Quantum simulation workshop**, Key Lab of Quantum Information University of Science and Technology of China, "*Novel orbital physics in cold atom optical lattices*", July 26, 2010.
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