

# Vita of Fu-Chun Zhang

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Fu-Chun Zhang	Kavli Institute for theoretical Sciences
Born: April 23, 1946	University of Chinese academy of Sciences
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## Education

1983	Ph.D. in Physics, Virginia Tech., USA
1978-1980	Graduate School of Univ. of Sci. and Technol. China, and Institute of Physics, Chinese Academy of Sciences
1968	College education, equivalent to bachelor degree Dept of Phys II, Fudan Univ., China

## Honors

2011-2014	Endowed Zhou Guangzhao Professorship in Natural Sciences, Univ. of Hong Kong
2005	Distinguished Research Achievement Award of HKU
2004	National Award in Natural Sciences, 2nd Class, China shared with Y. Q. Li, D. N. Shi, M. Ma, and S. J. Gu
2002	University Distinguished Research Professor, University of Cincinnati
1999	Fellow of American Physical Society
1997	Faculty Achievement Award, Univ. of Cincinnati

## Scholarship and Editorship

### Editorship:

2003- Associate Editor, Journal of Physical Society of Japan  
2005- Editor, International Journal of Modern Physics B, Singapore  
2007 -10 Co-Editor, EPL (Europhysics Letters)  
2007 -10 Divisional Associate Editor, Physical Review Letters  
2016 - Board Member, Journal of Physical Society of Japan

### Other academic activities

2014- 2016 Chair, Science Council, Asia Pacific Center for Theoretical Physics, Pohang, Korea  
2012 -2016 Member of Science Advisory Committee, MPI of Chemical Physics of Solid, Dresden, Ger  
2011- Member-in-Large, Overseas Chinese of Physics and Astronomy  
2011-2016 Chairman, Asia Pacific Workshop Committee on Condensed Matter Physics  
2010 - Member, Advisory Committee, Nat Key Lab. on Superconductivity, Beijing, China  
Dec. 2009 Member, Science Assessment Committee, Center of Theoretical Science, Taiwan  
2009- Member, Science Council, Center for Quantum Manipulation and Control, Fudan Univ., China  
Dec. 2009 Member, Science Assessment Committee, Center of Theoretical Science, Taiwan  
Dec. 08 Member, Science Assessment Committee, Phys. Dept., Shanghai Jiao Tong Univ., China  
2008 - Member, Science Council, Asia Pacific Center for Theoretical Physics, Korea  
2008 -2014 Member, Advisor Committee, Faculty of Science, Baptist Univ. of Hong Kong  
2008 - Member, Advisor Committee, College of Science, Nat. Jiao Tong Univ., Taiwan  
2007-2012 Honorary Chairman, Physics Department, Zhejiang University  
Apr 2007 Member, Science Assessment Committee, Nat. Tsinghua Univ., Taiwan  
05- 07 Convenor, University's Strategic Theme "Computational Physics and Numerical Methods", HKU  
2003- 09 Guang-Biao Chair Professorship (honorary), Zhejiang University, China  
2000 -04 Overseas Assessor, Chinese Academy of Sciences

## Workshop organization

Mar 27-29, 2017 Chair, KITS Forum 2017, Beijing, China  
April 2015 Chair, Joint Workshop of Hangzhou Workshop on Quantum Matter and Asia Pacific Workshop, H  
Jun 2014 Program co-chair, OCPA (Overseas Chinese Physicists Association) 8 Workshop, Singapore  
Dec. 17-19, 2010 Chair, Hong Kong Forum of Physics, Hong Kong (HK)  
June 09 Elected Chair, Gordon Research Conference, Superconductivity, HK  
June 22-24, 09 Chair, Workshop on "Novel Topological States in Condensed Matter Physics", HK  
Dec. 08 Chair, Hong Kong Forum 2008, Quantum Matter and Simulations, HK  
Dec. 07 Chair, Hong Kong Forum of Physics - Frontier in Condensed Matter, HK  
Oct. 07 Vice Chair, Gordon Research Conference in Superconductivity, Switzerland  
Summer 07 Co-organizer, 1st program at KITPC (Kevli Inst. of Theor. Phys. China), Beijing  
Dec. 06 Co-organizer, Hong Kong Forum of Condensed Matter Physics Past, Present, and Future, HK  
May 06 Member, International Organizing Committee, Spintronics Workshop, Singapore  
Aug. 05 Director, Croucher Advanced Institute Study: Science and Application of Spintronics, HK  
June 04 Co-Chair, 2nd Asia Pacific Workshop "Frontiers in Condensed Matter Physics", HK

## External Grants since 2004

- 2004-2007 PI, RGC (Research Grant Council) individual CERG grant, Hong Kong, HKD 392K
- 2005-2008 PI, RGC CERG grant, HK, HKD 463.6K
- 2006-2009 PI, RGC Central Allocation Grant, HK  
"Exploring Novel Quantum Matter in Condensed Matter Physics", HKD 2.4M with  
Co-Is H. Q. Lin at CUHK, T. K. Ng at HKUST,  
L. H. Tang at BUHK, and Z. D. Wang at HKU
- 2006-2010 PI, 2 RGC CERG grants, HKD 938K, HK
- 2008-2011 PI, RGC GRF (General Research Fund, previously called CERG) grant, HKD 783K, HK
- 2009-2012 PI, RGC Collaborative Research Grant (previously called Central Allocation Grant),  
"Semiconductor Spntronics", HK, HKD 4.5M  
with Co-Is S. Q. Shen, X. D. Cui, M. H. Xie, W. K. Wong at HKU, J. N.  
Wang, X. R. Wang at HKUST, R. B. Liu, Q. Li at CUHK
- 2009-2011 PI, RGC GRF grant, HKD 486K
- 2010-2017 Principal Coordinator, HK UGC Area of Excellence grant  
"Theory, Modeling, and Simulation of Emerging Electronics", HKD 78M with  
PIs Guanhua Chen, Wengcho Chew, Jian Wang at HKU  
Philip Chan at HKUST, and Hong Guo at McGill
- 2010-2013 co-I, RGC Collaborative Research Grant,  
"Topological States in Condensed Matter Physics", HK, HKD 8M with  
T. K. Ng (PI) at HKUST et al.
- 2010-2014 PI, 2 RGC GRF grants, HKD 1,655K
- 2012 PI, NSFC grant, RMB 780K
- 2014 co-PI, 973 project "Quantum Computing", CNY 15M.
- 2017-2020 PI, NSFC grant, RMB 780K

## Experience

Jan. 17 - present	Director, Kavli Inst. for Theor. Sci.	UCAS
Jan 14 - Dec. 2016	Professor, Department of Physics	Zhejiang University
2008 - 2012	Member, University Research Council	HKU
Sep 05 - Dec 10	Director, Center of Theoretical and Computational Physics	The Univ. of Hong Kong (HKU)
Jul 05 - Nov 12	Head, Department of Physics	HKU
Aug 03 - Aug 14	Professor, Chair of Physics	HKU
Aug 06 - Jul 08	Associate Dean, Graduate School	HKU
Aug 06 - Jul 08	Board Member, Graduate Policy,	HKU
Aug 06 - Jul 08	Chair, Board of Graduate Study,	HKU
Aug 06 - Jul 08	Member, Board of Graduate Exam.,	HKU
May 02 - Aug 06	University Distinguished Research Professor	Univ. of Cincinnati, USA
Sep 88- Aug 06	Assist., Associate, Full Professor	Dept of Phys Univ. of Cincinnati, USA
Sep 86- Aug 88	Research Associate	Theoretische Physik, ETH Zuerich, Switzerland
Sep 84- Aug 86	Postdoctoral Fellow	Department of Physics Univ. of Maryland, USA
Sep 83- Aug 84	Postdoctoral Fellow	Department of Physics Univ. of Minnesota, USA
Sep 80- Aug 83	Teaching Assistant	Department of Physics Virginia Tech., USA
Dec 68- Oct 78	Engineer	Institute of Metallurgy Guiyang, China
Summer 1989	Visiting Professor	Univ. of Maryland, USA
Aug 1990	Visiting Scientist	Argonne National Labs, USA
Jun-Aug 1994	Visiting Professor	Kyoto Univ., Japan
Aug - Oct 1995	Visiting Assoc. Prof.	HKUST, Hong Kong
Nov 95 - Mar 96	Visiting Professor	Nat. Tsinghua Univ., Taiwan
Apr - Jul 1996	Guest Professor	ETH-Zurich, Switzerland
Jul- Aug 1996	Visiting Scientist	ICTP, Trieste, Italy
Jan 1998	Visiting scientist	Bell Lab, Lucent Technology, USA
Jan - Feb 1999	Visiting Professor	Universite Paul Sabatier, France
Sep - Dec 2000	Visiting Professor	Chinese Univ. of Hong Kong
May 2007	Visiting Professor	Univ. of Chicago and Argonne Nat. Lab.

## Research and Publications

Research fields: theoretical condensed matter physics, in particular strongly correlated electron systems including high temperature superconductivity.

- About 200 papers published in SCI with about 9000 citations.
- Ranked as number 780 of "ISI's Most Cited Physicists, 1981 - June 1997".
- Best paper: Ref. 24 published in 1988, on a microscopic model for high temperature superconducting copper oxides. Twice listed in "Science Watch's Top Ten for Physics", and has about 2400 citations. The minimum model (the t-J model) proposed in that paper is the most widely used and commonly accepted microscopic model in study of high temperature superconductivity. The new physics examined is a composite particle now called "Zhang-Rice singlet".
- 11 papers with each over 100 citations
- 38 papers published in the top journal of Physics, Physical Review Letters
- h-index is 48. (h-index: number of published articles with each article's citation equal to or more than h).

## Journal Articles

Publications listed below indicated with \*\*\* are some of my representative papers. The times cited of each paper except those most recently published is also indicated. The number of citations is based on data in 2015.

1. *A correction-to-scaling critical exponent for uids at order of  $\epsilon^3$* , F. C. Zhang and R. K. P. Zia, [Journal of Physics A15, page 3303-3305 \(1982\)](#). Times cited: 28
2. *Statistical-theory of type I antiferromagnetism and AB alloy super-lattice on a face centered lattice - a series expansion method*, Z. M. Liu, F. C. Zhang, W. I. Xue, and Y. Y. Li, *Chinese Physics 2: (4) 897-909 (1982)*. times cited: 2
3. \*\*\* *1/N expansion for the degenerate Anderson model in the mixed valence regime*, F. C. Zhang and T. K. Lee, [Phys. Rev. B 28, 33 \(1983\)](#). Times cited: 70
4. *Role of reversed spins in the correlated ground state for the fractional quantum Hall effect*, T. Chakraborty and F. C. Zhang, [Phys. Rev. B 29, 7032\(R\) \(1984\)](#). Times cited: 82
5. *Spectral density and magnetic susceptibility for the asymmetric degenerate Anderson model*, F. C. Zhang and T. K. Lee, [Phys. Rev. B 30, 1556 \(1984\)](#). Times cited: 42
6. *Ground state of two dimensional electrons and the reversed spins in the fractional quantum Hall effect*, F. C. Zhang and T. Chakraborty, [Phys. Rev. B 30, 7320\(R\) \(1984\)](#). Times cited: 81
7. *A revised diagrammatic technique for the degenerate Anderson model*, T. K. Lee and F. C. Zhang, [J. Appl. Phys. 55\(6\), 1936-1938 \(1984\)](#). Times cited: 12
8. *Growth of order in order-disorder transitions: Tests of universality*, F. C. Zhang, O. T. Valls and G. F. Mazenko, [Phys. Rev. B 31, 1579 \(1985\)](#). Times cited: 32
9. *Kinetics of first-order phase transitions: Monte Carlo simulations, renormalization-group methods and scaling for critical quenches*, G. F. Mazenko, O. T. Valls and F. C. Zhang, [Phys. Rev. B 31, 4453 \(1985\)](#). Times cited: 81
10. *Renormalization group theory of spinodal decomposition*, G. F. Mazenko, O. T. Valls and F. C. Zhang, [Phys. Rev. B 32, 5807 \(1985\)](#). Times cited: 60
11. *Effect of a charged impurity on the fractional quantum Hall effect: Exact numerical treatment of a finite system*, F. C. Zhang, V. Z. Vulovic, Y. Guo and S. Das Sarma, [Phys. Rev. B 32, 6920\(R\) \(1985\)](#). Times cited: 50
12. \*\*\* *Excitation gap in the fractional quantum effect: Finite layer thickness corrections*, F. C. Zhang and S. Das Sarma, [Phys. Rev. B 33, 2903\(R\) \(1986\)](#). Times cited: 193
13. *Elementary excitations in the fractional quantum Hall effect and the spin reversed quasiparticles*, T. Chakraborty, P. Pietilainen and F. C. Zhang, [Phys. Rev. Lett. 57, 130 \(1986\)](#). Times cited: 84
14. *Termination of hierarchy of fractional quantum Hall states: Scaling of impurity effect*, F. C. Zhang, [Phys. Rev. B 34, 5598 \(1986\)](#). Times cited: 5
15. *Spin-1 quasiparticle and spin polarizations of the ground state in the fractional quantum Hall effect*, F. C. Zhang and T. Chakraborty, [Phys. Rev. B 34, 7076 \(1986\)](#). Times cited: 25
16. *Extended and localized states in the Anderson lattice model*, T. K. Lee and F. C. Zhang, [Phys. Rev. B 34, 8114 \(1986\)](#). Times cited: 3

17. *Hard-core repulsive interactions in even parity electron pairings for heavy fermion systems*, F. C. Zhang and T. K. Lee, [Phys. Rev. B 35, 3651\(R\) \(1987\)](#). Times cited: 16
18. *Two competing interactions in the Anderson lattice model*, F. C. Zhang, T. K. Lee and Z. B. Su, [Phys. Rev. B 35, 4728 \(1987\)](#). Times cited: 10
19. *Bipolaron condensation induced by doping of charge density wave systems*, P. Prelovsek, T. M. Rice and F. C. Zhang, [J. Phys. C: Solid State Phys. 20 L229 \(1987\)](#). Times cited: 111
20. *Effective magnetic moments of heavy fermions and the Wilson ratio for the Kondo lattice - Comment*, F. C. Zhang and T. K. Lee, [Phys. Rev. Lett. 58, 2728 \(1987\)](#). Times cited: 18
21. \*\*\* *A renormalized Hamiltonian approach to a resonant valence bond wavefunction*, F. C. Zhang, C. Gros, T. M. Rice and H. Shiba, [Supercond. Sci. Technol. 1 36-46 \(1988\)](#). Times cited: 422
22. *Absence of the long range antiferromagnetic order in doped  $La_{2-x}Sr_xCuO_4$* , Y. Takahashi and F. C. Zhang, [Zeitschrift für Physik B 69, 443-447 \(1988\)](#). Times cited: 10
23. *Dimerization in two-dimensional Hubbard model*, F. C. Zhang and P. Prelovsek, [Phys. Rev. B 37, 1569 \(1988\)](#). Times cited: 31
24. \*\*\* *Effective Hamiltonian for the superconducting Cu-oxides*, F. C. Zhang and T. M. Rice, [Phys. Rev. B 37, 3759\(R\) \(1988\)](#). Times cited: 2390
25. *The formation of resonating valence bond droplet in  $La_2CuO_4$  based compounds*, T. K. Lee, F. C. Zhang and L. N. Chang, [J. Phys. C: Solid State Phys. 21, L225-L229 \(1988\)](#). Times cited: 4
26. *Frequency-dependent conductivity from carriers in Mott insulator*, T. M. Rice and F. C. Zhang, [Phys. Rev. B 39, 815\(R\) \(1989\)](#). Times cited: 74
27. *Exact mapping from a two-band model for Cu-oxides to a single band Hubbard model*, F. C. Zhang, [Phys. Rev. B 39, 7375\(R\) \(1989\)](#). Times cited: 42
28. *Impurity states in the  $t$ - $J$  model*, K. J. Von Szczepanski, T. M. Rice and F. C. Zhang, [Europhys. Lett. 8\(8\), 797-802 \(1989\)](#). Times cited: 17
29. *Fractional quantum Hall effect with spin reversal*, X. C. Xie, Y. Guo, and F. C. Zhang, [Phys. Rev. B 40, 3487\(R\) \(1989\)](#). Times cited: 40
30. *Asymmetry in the hierarchy formalism of the fractional quantum Hall status*, F. C. Zhang and X. C. Xie, [Phys. Rev. B 40, 11449\(R\) \(1989\)](#). Times cited: 8
31. *Infinite  $U_d$ ,  $U_p$  ground state of the extended Hubbard model - Reply*, F. C. Zhang and T. M. Rice, [Phys. Rev. B 41, 2560 \(1990\)](#). Times cited: 13
32. \*\*\* *Superconducting Instability of staggered- $u_x$  phase in the  $t$ - $J$  model*, F. C. Zhang, [Phys. Rev. Lett. 64, 974 \(1990\)](#). Times cited: 55
33. *Validity of singlet model*, F. C. Zhang and T. M. Rice, [Phys. Rev. B 41, 7243 \(1990\)](#). Times cited: 51
34. *Phases of the  $t$ - $J$  model from variational Monte Carlo studies*, G. J. Chen, Robert Joynt, F. C. Zhang, and C. Gros, [Phys. Rev. B 42, 2662\(R\) \(1990\)](#). Times cited: 74
35. *Self-consistent mean field approach for ideal anyon gas*, L. Zhang, M. Ma, and F. C. Zhang, [Phys. Rev. B 42, 7894 \(1990\)](#). Times cited: 13
36. *Destruction of fractional quantum Hall effect in thick layer systems*, S. He, F. C. Zhang, X. C. Xie, and S. Das Sarma, [Phys. Rev. B 42, 11376\(R\) \(1990\)](#). Times cited: 40

37. *Spin singlet Laughlin-Halperin type wavefunctions for the quantum Hall states*, X. C. Xie and F. C. Zhang, [Modern Physics Letter, B5, 471-478 \(1991\)](#). Times cited: 6
38. *Collective modes in anyon lattice*, F. C. Zhang, M. Norman, [Phys. Rev. B 43, 6143 \(1991\)](#). Times cited: 4
39. \*\*\* *Quantum Hall effect of ideal anyons*, M. Ma, and F. C. Zhang, [Phys. Rev. Lett. 66, 1769 \(1991\)](#). Times cited: 19
40. *Quantum Hall effect in double quantum wells*, S. He, X. C. Xie, S. Das Sarma, and F. C. Zhang, [Phys. Rev. B 43, 9339\(R\) \(1991\)](#). Times cited: 61
41. *Staggered flux phases in the t-J model {a Monte Carlo study}*, G. J. Chen, R. Joynt, and F. C. Zhang, [J. Phys.: Condens. Matter. 3, 5213 \(1991\)](#). Times cited: 3
42. *The Dzyaloshinskii-Moriya' interaction in the cuprates*, D. Coey, T. M. Rice and F. C. Zhang, [Phys. Rev. B 44, 10112 \(1991\)](#). Times cited: 76
43. \*\*\* *Attractive interactions and superconductivity for C<sub>60</sub>*, F. C. Zhang, M. Ogata, and T. M. Rice, [Phys. Rev. Lett. 67, 3452 \(1991\)](#). Times cited: 142
44. *Spin orbit and spirals in doped La<sub>2</sub>CuO<sub>4</sub>*, N. E. Bonesteel, T. M. Rice, and F. C. Zhang, [Phys. Rev. Lett. 68, 2684 \(1992\)](#). Times cited: 68
45. *Anyons, boundary constraint, and hierarchy in fractional quantum Hall effect*, S. He, X. C. Xie, and F. C. Zhang, [Phys. Rev. Lett. 68, 3460 \(1992\)](#). Times cited: 61
46. *Optical excitation of quasi particle pairs in the vortex core of high T<sub>c</sub> superconductors*, K. Karrai, E. J. Choi, F. Dunmore, S. H. Liu, H. D. Drew, Q. Li, D. B. Fenner, Y. D. Zhu, F. C. Zhang, [Phys. Rev. Lett. 69, 152 \(1992\)](#). Times cited: 75
47. *Reanalysis of fractional quantum Hall effect in systems with vanishing range interactions*, F. C. Zhang, M. Ma, Y. D. Zhu, J. K. Jain, [Phys. Rev. B 46, 2632\(R\) \(1992\)](#). Times cited: 2
48. *Chiral optical resonance of vortex core states in type II superconductors*, Y. D. Zhu, F. C. Zhang, and H. D. Drew, [Phys. Rev. B 47, 586\(R\) \(1993\)](#). Times cited: 13
49. *Application of a Su-Schrieffer-Heeger-like model to the intra-molecular electron-phonon coupling in C<sub>60</sub> clusters*, W. M. You, C. L. Wang, F. C. Zhang, Z. B. Su, [Phys. Rev. B 47, 4765 \(1993\)](#). Times cited: 36
50. *Fermion analogy of anyon superconductivity in the two-dimensional electron gas*, Yong Ren and F.C. Zhang, [Phys. Rev. B 49, 1532\(R\) \(1994\)](#). Times cited: 11
51. \*\*\* *Superconductivity in quasi-one-dimensional chains*, M. Sigrist, T. M. Rice, and F. C. Zhang, [Phys. Rev. B 49, 12058 \(1994\)](#). Times cited: 173
52. *Electronic structure of a vortex line in type II superconductor {Effect of atomic crystal field}*, Y. D. Zhu, F. C. Zhang, and M. Sigrist, [Phys. Rev. B 51, 1105 \(1995\)](#). Times cited: 12
53. *Exact scaling relation in one and two-dimensional Luttinger liquid*, Yong Ren and F. C. Zhang, [Phys. Rev. B 52, 536 \(1995\)](#). Times cited: 2
54. *On the metallic nature of heavily doped polyacetylene*, Y. H. Kim and F. C. Zhang, [Synthetic Metals 69, 663-665 \(1995\)](#).
55. *Momentum-transfer resolved electron-energy-loss spectroscopy of solids {problems, solutions and applications}*, Y. Y. Wang, S. C. Cheng, V. P. Dravid, and F. C. Zhang, [Ultramicroscopy 59, 109-119 \(1995\)](#). times cited: 13

56. *Momentum-transfer resolved electron-energy-loss spectroscopy in BaBiO<sub>3</sub> - anisotropic dispersion of threshold excitation and optical forbidden transition*, Y. Y. Wang, V. P. Dravid, N. Bulut, M. V. Klein, S. E. Schnatterly, and F. C. Zhang, *Phys. Rev. Lett.* **75**, 2546 (1995). Times cited: 12
57. *Phase transitions of the bilayered spin-S Heisenberg model*, K. K. Ng, F. C. Zhang, and M. Ma, *Phys. Rev. B* **53**, 12196 (1996). Times cited: 10
58. *Momentum-dependent charge transfer excitations in Sr<sub>2</sub>CuO<sub>2</sub>Cl<sub>2</sub>-angle resolved electron energy loss spectroscopy*, Y. Y. Wang, F. C. Zhang, V. P. Dravid, K. K. Ng, M. V. Klein, S. E. Schnatterly, and L. L. Miller, *Phys. Rev. Lett.* **77**, 1809 (1996). Times cited: 54
59. *Spin and charge texture around in-plane charge centers in the CuO<sub>2</sub> planes*, Stephan Haas, F. C. Zhang, F. Mila, T. M. Rice, *Phys. Rev. Lett.* **77**, 3021 (1996). Times cited: 31
60. *Anomalous magnetic and superconducting properties in a Ru-based double perovskite*, M. K. Wu, D. Y. Chen, F. Z. Chien, S. R. Sheen, D. C. Ling, C. Y. Tai, G. Y. Tseng, D. H. Chen, F. C. Zhang, *Zeitschrift für Physik B102*, 37-41 (1997). Times cited: 76
61. *\*\*\* Electronic structure of lanthanum hydrides with switchable optical properties*, K. K. Ng, F. C. Zhang, V. I. Anisimov, and T. M. Rice, *Phys. Rev. Lett.* **78**, 1311 (1997). Times cited: 75
62. *Lightly doped t-J three-leg ladders: An analog for the underdoped cuprates*, T. M. Rice, S. Haas, M. Sigrist, and F. C. Zhang, *Phys. Rev. B* **56**, 14655 (1997). Times cited: 49
63. *\*\*\* SU(4) theory for spin systems with orbital degeneracy*, Y. Q. Li, M. Ma, D. N. Shi, and F. C. Zhang, *Phys. Rev. Lett.* **81**, 3527 (1998). Times cited: 154
64. *\*\*\* Theory of excitons in insulating cuprates*, F. C. Zhang and K. K. Ng, *Phys. Rev. B* **58**, 13520 (1998). Times cited: 36
65. *Theory for metal hydrides with switchable optical properties*, K. K. Ng, F. C. Zhang, V. I. Anisimov, and T. M. Rice, *Phys. Rev. B* **59**, 5398 (1999). Times cited: 76
66. *Elementary excitations in magnetically ordered systems with spin degeneracy*, A. Joshi, M. Ma, F. Mila, D. N. Shi, and F. C. Zhang, *Phys. Rev. B* **60**, 6584 (1999) Times cited: 34
67. *Ground state and excitations of spin chain with orbital degeneracy*, Y. Q. Li, M. Ma, D. N. Shi, and F. C. Zhang, *Phys. Rev. B* **60**, 12781 (1999). Times cited: 44
68. *Biquadratic interactions and spin-Peierls transition in the spin-1 chain LiVGe<sub>2</sub>O<sub>6</sub>*, P. Millet, F. Mila, F. C. Zhang, M. Mambrim, A. B. Van Oosten, V. A. Pashchenko, A. Sulpice, A. Stepanov, *Phys. Rev. Lett.* **83**, 4176 (1999). Times cited: 53
69. *On the origin of biquadratic exchange in spin 1 chains*, F. Mila and F. C. Zhang, *Eur. Phys. J. B* **16**, Issue 1, pp7-10 (2000). Times cited: 20
70. *Metal-insulator transition in colossal magnetoresistance materials*, V. N. Smolyainova, X. C. Xie, F. C. Zhang, M. Rajeswary, R. L. Green, and S. Das Sarma, *Phys. Rev. B* **62**, 3010(2000). Times cited: 15
71. *\*\*\* Orbitally degenerate spin-1 model for insulating V<sub>2</sub>O<sub>3</sub>*, F. Mila, H. Shiina, F. C. Zhang, A. Joshi, M. Ma, and T. M. Rice, *Phys. Rev. Lett.* **85**, 1714 (2000). Times cited: 67
72. *Plaquette ground state in the Two-dimensional SU(4) Spin-Orbital Model*, Mathias van den Bossche, Fu-Chun Zhang, and Frederic Mila, *Eur. Phys. J. B* **17**, 367 (2000). Times cited: 24
73. *Atomic spin, molecular orbitals and anomalous antiferromagnetism in insulating V<sub>2</sub>O<sub>3</sub>*, R. Shiina, F. Mila, F. C. Zhang, and T. M. Rice, *Phys. Rev. B* **63**, 144422 (2001). Times cited: 28



74. *Theory for Phase Transitions in  $V_2O_3$* , A. Joshi, M. Ma, and F. C. Zhang, [Phys. Rev. Lett. 86, 5743 \(2001\)](#). Times cited: 12
75. *Quantum critical point in a periodic Anderson model*, P. G. J. van Dongen, K. Majumdar, C. Huscroft, and F. C. Zhang [Phys. Rev. B 64, 195123 \(2001\)](#). Times cited: 9
76. *Coexistence of ferromagnetism and superconductivity in Cu rich lanthanum Cu-oxide*, B. R. Zhao, X. L. Dong, P. S. Luo, M. Gao, Z. X. Zhao, L. M. Peng, Y. M. Ni, X. G. Qiu, S. Awaji, K. Watanabe, F. Wu, B. Xu, L. H. Zhao, and F. C. Zhang, [Eur. Phys. J. B 25, 19 \(2002\)](#). Times cited: 5
77. *High spin systems with orbital degeneracy*, S. Q. Shen X. C. Xie and F. C. Zhang, [Phys. Rev. Lett. 88, 027201-1 \(2002\)](#). Times cited: 21
78. *Plaquette Ordering in  $SU(4)$  Antiferromagnets*, A. Mishra, M. Ma, and F. C. Zhang, [Phys. Rev. B 65, 214411 \(2002\)](#). Times cited: 8
79. *Pathology of Schwinger boson mean field theory for Heisenberg spin models*, Theja N. De Silva, M. Ma, and F. C. Zhang, [Phys. Rev. B 66, 104417 \(2002\)](#). Times cited: 4
80. *Anti-ferromagnetic Heisenberg model on anisotropic triangular lattice in the presence of magnetic field*, S. Q. Shen and F. C. Zhang, [Phys. Rev. B 66, 172407 \(2002\)](#). Times cited: 12
81. *Spin wave theory for antiferromagnetic XXZ model on a triangular lattice in the presence of an external magnetic field*, J. Y. Gan, F. C. Zhang, and Z. B. Su, [Phys. Rev. B 67, 144427 \(2003\)](#). Times cited: 8
82. *Gossamer superconductor, Mott insulator, and resonating valence bond state in correlated electron systems*, F. C. Zhang, [Phys. Rev. Lett. 90, 207002\(2003\)](#). Times cited: 67
83. *Theory for spin and orbital ordering in high temperature phase in  $YVO_3$* , Th. N. De Silva, A. Joshi, M. Ma, and F. C. Zhang, [Phys. Rev. B 68, 184402 \(2003\)](#). Times cited: 6
84. *The physics behind high-temperature superconducting cuprates: the "plain vanilla" version of RVB*, P. W. Anderson, P. A. Lee, M. Randeria, T. M. Rice, N. Trivedi, and F. C. Zhang, [J. Phys.: Condense Matter 24, Topical Review R755 \(2004\)](#). Times cited : 320
85. *Resonant spin Hall conductance in two-dimensional electron systems with a Rashba interaction in a perpendicular magnetic field*, S. Q. Shen, M. Ma, X. C. Xie, and F. C. Zhang, [Phys. Rev. Lett. 92, 256603 \(2004\)](#). Times cited: 109
86. *Dynamically generated dimension reduction and crossover in a spin orbital model*, Theja N. De Silva, M. Ma, and F. C. Zhang, [Phys. Rev. B 70, 100405\(R\) \(2004\)](#).
87. *Directional Ordering of Fluctuation in a Two-Dimensional Compass Model*, Anup Mishra, Michael Ma, Fu-Chun Zhang, Siegfried Gurtler, Lei-Han Tang, and Shaolong Wan, [Phys. Rev. Lett. 93, 207201 \(2004\)](#). Times cited: 40
88. *Theory of gossamer and resonating valence bond superconductivity*, J. Y. Gan, F. C. Zhang, and Z. B. Su, [Phys. Rev. B 71, 014508 \(2005\)](#). Times cited: 17
89. *Gossamer Superconductivity near Antiferromagnetic Mott Insulator in Layered Organic Conductors*, J. Y. Gan, Yan Chen, Z. B. Su, F. C. Zhang, [Phys. Rev. Lett. 94, 067005 \(2005\)](#). Times cited: 51
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Conference Papers, Invited Magazine Articles and Other Publications

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2. *High Tc superconductivity - Hubbard Model?*, F.C. Zhang, Proceedings of the 5th International Conference on the Recent Progress in Many-body Theories, [Volume 1, pp 31-37](#) edited by A. J. Kallio, E. Pajanne and R. F. Bishop, Prentice Hall, N.Y. 1988.
3. *Superconductivity in strongly correlated wavefunctions*, C. Gros, D. Poiblanc, T. M. Rice and F. C. Zhang, [Physica C153-155, 543-548 \(1988\)](#). Times cited: 11
4. *The single band effective Hamiltonian for high Tc superconductors from a cluster analysis of experimental data*, F. Mila, F. C. Zhang and T. M. Rice, [Physica C 153-155, 1221-1222 \(1988\)](#). Times cited: 9
5. *Mean field RVB theory, degeneracy, gauge symmetry and the comparison to exact results*, F. C. Zhang, C. Gros, T. M. Rice, H. Shiba and R. Joynt, [Physica C 153-155, 1251-1252 \(1988\)](#). Times cited: 4
6. *Electronic structure and superconductivity for Cu-oxides*, F. C. Zhang, [Phys. Scr. T27, 117-120 \(1989\)](#). time cited: 1
7. *Incompressible quantum liquid states of ideal anyons*, F. C. Zhang and M. Ma, [Modern Physics B 5, 1725-1729 \(1991\)](#).
8. *Electronic Structure of High Tc Superconductors*, T. M. Rice, F. Mila, and F. C. Zhang, [Philosophical Transactions of the Royal Society of London, A334, 459-471 \(1991\)](#). Times cited: 13
9. *Cuprates intermediate between one and two dimensions*, T. M. Rice, S. Gopalan, M. Sigrist, and F. C. Zhang, [Journal of Low Temperature Physics 95, 299-308 \(1994\)](#). Times cited: 1
10. *Momentum-transfer resolved electron-energy-loss spectroscopy of solids{ problems, solutions and applications*, Y. Y. Wang, S. C. Cheng, V. P. Dravid, and F. C. Zhang, [Ultramicroscopy 59, 109-119 \(1995\)](#). Times cited: 3
11. *Superconductivity in a Ru-based double perovskites*, M. K. Wu, S. R. Sheen, D. C. Ling, C. Y. Tai, G. Y. Tseng, D. H. Chen, D. Y. Chen, F. Z. Chien, and F. C. Zhang, [Czechoslovak Journal of Physics, 46, 3381, Suppl. 6 \(1996\)](#). Times cited: 6
12. *Anyon superconductivity in Si-Mosfet?*, F. C. Zhang and T. M. Rice, [LANL con-mat 97-08050](#).
13. *\*\*\* Colourful electrons solve puzzle of ferromagnetism*, F. C. Zhang, [Physics World 14: \(7\) page 24-25, July 2001](#). Times cited: 2
14. *Theory of molecular orbital ordering and anomalous antiferromagnetism in V2O3*, R. Shiina, F. Mila, F. C. Zhang, T. M. Rice, [Physica B 312: 696-697 \(2002\)](#).
15. *Phase transition in insulating vanadium oxide*, A. Joshi, M. Ma, and F. C. Zhang, [Int. J. Mod. Phys. B 16, 3338 \(2002\)](#).
16. *RVB and Gossamer superconductivity*, F. C. Zhang, J. Y. Gan, and Z. B. Su, [Physica C 408-410, 211-213 \(2004\)](#).
17. *Gossamer superconductivity in layered organic compounds*, J. Y. Gan, Y. Chen, Z. B. Su, and F. C. Zhang, [Prog. Theor. Phys. Supp. 160, 15-27 \(2005\)](#).
18. *Atomic scale rotational symmetry breaking in lightly doped Ca<sub>2-x</sub>N<sub>x</sub>CuO<sub>2</sub>Cl<sub>2</sub>*, Y. Chen, T. M. Rice, F. C. Zhang, [PHYSICA C 460, 1159, Part 2 \(2007\)](#).
19. *A phenomenological theory of the pseudogap state* T. M. Rice, K. Y. Yang, F. C. Zhang, [PHYSICA C v460, 252-255, \(2007\)](#).
20. *Theory of resonant spin hall effect* F. C. Zhang, S. Q. Shen, [Int. J. Mod. Phys. B 22, 94-103 \(2008\)](#).

## **A Partial List of Invited Talks in International/National/Regional Work-shops**

*Theory for giant phonon anomaly in underdoped high Tc superconductor.*

International Workshop in unconventional superconductivity, Shanghai, China, June 2015

*Theory for newly discovered quasi-one dimensional superconductivity.*

International Workshop on correlated electron systems and novel superconductors, Beijing, China, June 2015.

*Role of disorder in quantization in spin Hall effect.*

Majorana fermions in solid state, Peking University, Beijing, June, 2013

*Si-impurity in quantum spin Hall effect.*

Workshop on topological insulators and superconductors, Tsukuba, Japan, April 1, 2014

*Theory for underdoped high temperature superconducting copper oxides.*

25 years discovery of high Tc YBCO, Hualien, Taiwan, April 12, 2012

*Field induced p-wave superconductivity in mesoscopic systems.*

Sino-German Bilateral Workshop on Emergent Phases in Correlated and Topological Matter and 2012 Hangzhou Workshop on Quantum Matter, Hangzhou, China, April 2-6, 2012.

*Theory for disorder effect in Fe-based superconductors.*

First QSSC Theory Forum "Riken-APW-APCTP Joint Workshop" on Recent Trend in Condensed Matter Physics, Riken Wako, Tokyo, Japan, Jan. 14-16, 2012.

*Chiral p-wave superconductivity in mesoscopic systems.*

Workshop on Novel Phenomena in Condensed Matter Physics, Yukawa Institute, Kyoto, Japan, Nov. 29- Dec. 4, 2011.

*Theory of superconductivity in mesoscopic systems.*

KITP, Univ. of California, Santa Barbara, USA, Oct. 2011.

*Closing Remarks.*

International Conference on Novel Superconductivity, Special Symposium on Centennial Discovery of Superconductivity - in memory of B. T. Matthias, National Cheng Kung University, Taiwan, August 4-8, 2011.

*Theory for high Tc superconductivity.*

7 lectures in Summer School, Fudan University, China, July 2011.

*Phenomenological theory for under-doped cuprates.*

Summer Workshop in superconductivity, Turkey, July 2011.

*Phenomenological theory for under-doped cuprates.*

ICC-IMR International Workshop, Tohoku University, Sendai, Japan, Aug 9-11, 2010.

*Andreev tunneling in high temperature superconducting copper oxides.*

Beijing Forum on High Tc Superconductivity, Jiuzhaiguo, China, June, 2010

*Topological insulator.*

National Taiwan University, Dec. 2009.

*Topological insulator.*

Institute of Physics, Academia Sinica, Dec. 2009.

*Anderson impurity in topological insulator.*

2009 Riken workshop on Emerging Phenomena of Correlated Materials, Dec. 2-4, 2009, Wako, Japan

*Anderson impurity in topological insulator.*

Asia 3 Countries Foresight Program 4th Workshop, on Joint research on Novel Properties of Emerging Materials, Huangshan, China, Oct. 25-27, 2009.

*Anderson impurity in topological insulator.*

Hangzhou Workshop on Correlated Systems, Hangzhou, China, Oct., 2009

*Summary on mechanism of superconductivity.*

9th Conference of Materials and Mechanisms of Superconductivity, Tokyo, Sept. 7-12, 2009.

*Pairing symmetry in superconducting iron pnictides.*

Kevli Institute of Theoretical Physics, Univ. of California, Santa Barbara, USA, July, 2009.

*Recent development in condensed matter physics.*

National Taiwan University, Jan. 2009.

*Theory for superconductivity in Iron pnictide.*

International Symposium on Anomalous Quantum Materials 2008, Tokyo, Nov. 7-11, 2008

*Theory for superconductivity in Iron pnictide.*

Beijing International Workshop on Iron (Nickel) Based Superconductors, Beijing, Oct. 17-19, 2008

*High temperature superconducting iron pnictides.*

National Taiwan University, Oct. 2008.

*Theory for superconductivity in Iron pnictide.*

International Conference on Superconductivity and Magnetism, Taiwan, June 2008

*Polarized Ultracold Fermions in Optical Lattices.*

ETH-Zurich, Feb. 2008.

*Theory for quantum oscillation in cuprates.*

Osaka Workshop, Osaka, Japan, Dec. 2007.

*Exploring Exotic Superfluidity of Polarized Ultracold Fermions in Optical Lattices.*

International workshop on low dimensional systems and quantum matters Yukawa Institute, Kyoto, Japan, Nov. 2007

*Theory for quantum oscillation in cuprates.*

Swiss Annual Physical Society Meeting, Switzerland, Oct. 2007.

*Theory for quantum oscillation in cuprates.*

Magnetic Materials and Superconductivity Workshop, Sendai, Japan, August 2007.

*Possible super-solid in helium 4.*

Univ. of Chicago, May 2007

*Possible super-solid in helium 4.*

Univ. of Wisconsin, May 2007.

*Theory for high Tc cuprates.*

Shanghai Jiao Tong University, April 2007.

*Theory for High Tc Cuprates.*

SC3N International Conference on Superconductivity, Sydney, Jan. 2007.

*Phenomenological Theory of Pseudogap Phase in High Tc.*

Beijing Forum of High Tc, Nov. 2006.

*Theory for High Tc Cuprates.*

2006 Hangzhou International Workshop on Quantum Matter, Hangzhou, China, Oct. 2006.

*Rotational Symmetry Broken in Solium Doped High Tc Superconductor.*

8th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Dresden, Germany, July 2006.

*A Phenomenological Theory for Pseudogap Phase of High Tc Cu-Oxides.*

International Symposium on Anomalous Quantum Mechanics, Okinawa, Japan, June 2006.

*Light induced anomalous Hall effect in semiconductors with spin-orbit coupling.*

First Fudan Conference of Quantum Control, Fudan University, June 2006.

*Resonant Spin Hall Conductance in 2-Dimensional Electron Gas with Rashba Coupling in a Strong Magnetic Field.*

International Workshop on Spintronics, Singapore, May, 2006.

*A Phenomenological Theory for Pseudogap Phase of High Tc Cu-Oxides.*

Invited speech at Institute of Physics Annual Workshop, Exeter, UK, April 2006.

*Rotational symmetry broken in sodium doped high T<sub>c</sub>.*

University College London, UK, April 2006

*Rotational symmetry broken in sodium doped high T<sub>c</sub>.*

ISIS, Rutherford Laboratories, UK, April 2006.

*Nineteen years of high temperature superconductivity .*

Plenary speech on "Osaka University-Asia Pacific-Vietnam National University, Hanoi Forum

on Frontiers of Basic Science: Towards New Physics, Earth and Space Science, Mathematics",  
Hanoi, Vietnam, Sept. 27-29, 2005.

*Resonant Spin Hall Conductance in 2-Dimensional Electron Gas with Rashba Coupling in a Strong  
Magnetic Field.*

APCTP Workshop on semiconductor nano-spintronics: spin-Hall effect and related issues, Pohang,  
Korea, August 10, 2005.

*Recent Development in Condensed Matter Physics.*

Nanjing University, with audience of undergraduate students, March 2005

*Recent Development in Condensed Matter Physics.*

Yun-Nan University, May 2005

*Plain vanilla version of RVB theory for high T<sub>c</sub> superconductivity.*

Nanjing University, March 2005

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*

Fudan University, Shanghai, Dec. 2004.

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*

Chinese University of Hong Kong, Hong Kong, Nov. 2004

*Superconductivity in layered organic conductors .*

International Workshop in Strongly Correlated Electrons, Kyoto, Japan, Nov. 2004.

*Gossamer superconductivity in organic conductors.*

ETH-Zurich, Sept. 2004.

*The physics behind high T<sub>c</sub> superconducting cuprates: plain vanilla version of RVB.*

Plenary talk on 2004 Taiwan International Conference on Superconductivity  
and the 7th Workshop on Low Temperature Physics, Penghu, Taiwan, July 5-9, 2004.

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*

The National University of Taiwan, Taipei, July 2004.

*The physics behind high Tc superconducting cuprates: plain vanilla version of RVB.*  
OCA2004, Shanghai, China, June, 2004.

*Resonant Spin Hall Conductance in 2-Dimensional Electron Gas with Rashba Coupling in a Strong Magnetic Field.*  
4th Workshop of International Center of Quantum Structure, Beijing China, June 2004.

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*  
University College London, May 2004.

*Plain vanilla version of RVB theory for high Tc superconductivity.*  
Max Planck Institute, Stuttgart, May 2004

*Plain vanilla version of RVB theory for high Tc superconductivity.*  
Theoretische Physik, ETH-Zurich, May 2004.

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*  
Nanjing Univ., China, April 2004.

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*  
Zhejiang Univ., China, March 2004

*Resonant spin Hall conductance in 2D electron gas in a magnetic field.*  
Institute of Theoretical Physics, Beijing, China, Feb. 26, 2004

*Gossamer superconductivity.*  
Workshop on Novel Physics in Transition Metal Oxides, Sendai, Japan, Nov. 5-8, 2003.

*Plain vanilla version of RVB theory for high Tc superconductivity.*  
Center for Theoretical Sciences, Hsinchu, Taiwan, Nov. , 2003

*The physics behind high Tc superconducting cuprates: plain vanilla version of RVB.*  
International symposium on advanced magnetic technologies, Taipei, Nov. 13-16, 2003.

*Gossamer superconductivity.*  
Workshop in Condensed Matter Physics, Nanjing, China, Oct. , 2003.

*The physics behind high Tc superconducting cuprates: plain vanilla version of RVB.*  
Condensed Matter and Statistical Mechanics Annual Workshop, Shanghai, China, Oct., 2003.

*Plain vanilla version of RVB theory for high Tc superconductivity.*  
Fudan University, Shanghai, China, Oct., 2003.

*Plain vanilla version of RVB theory for high Tc superconductivity.*  
Hong Kong University of Science and Technology, Sept., 2003.

*Gossamer superconductivity.*

Institute of Physics, Chinese Academy of Sciences, Beijing, China, July 25, 2003.

*Gossamer superconductivity.*

Zhejiang University, Hangzhou, Zhejiang, China, July 19, 2003.

*Gossamer superconductivity.*

University of Cincinnati, June 2, 2003.

*Gossamer superconductivity.*

International Conference on Magnetic Materials and Superconductivity, Rio, Brazil, May 25-30, 2003.

*Gossamer superconductivity.*

University of Sherbrook, Canada, May 9, 2003.

*Carbon nanotubes and ladder Systems.*

Center for Condensed Matter Materials, Taiwan University, Taiwan, March, 2003.

*Wonderful World of Spins.*

Department of Physics, Taiwan University, Taiwan, March, 2003.

*Gossamer superconductivity.*

University of Michigan, Ann Arbor, Feb. 11, 2003.

*Gossamer superconductivity.*

Center for Theoretical Sciences, Hsinchu, Taiwan, Nov. 29, 2002.

*Gossamer superconductivity.*

Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China, Nov. 26, 2002.

*Gossamer superconductivity.*

The University of Hong Kong, Nov. 22, 2002.

*Gossamer superconductivity.*

6<sup>th</sup> International Symposium on Spin-Charge-Photon Coupled Systems, Tokyo, Japan, Nov. 19, 2002.

*Gossamer superconductivity.*

Workshop on Advanced Light Source at Berkeley National Laboratory, Oct. 11, 2002.

*Gossamer superconductivity.*

Los Alamos National Laboratory, Sept. 9, 2002.

*Closing Remarks, Theory.*

The 2002 International Conference on Physics and Chemistry of Molecular and Oxide Superconductors, Hsinchu, Taiwan (August 13 - 18, 2002)

*Microscopic models for high temperature superconductivity.*

Plenary talk in Croucher Advanced Study Institute "New development in high Tc superconductivity theory", (June 17-22, 2002)

*Theory of exciton in insulating copper oxides.*

Univ. of Southern California, USA, April 12, 2002.

*Theory of excitons in insulating copper oxides.*

Invited talk in the American Physics Society March Meeting, Indiana, (Mar. 18, 2002).

*fractional and composite particles in condensed matter.*

Institute of Theoretical Physics, Academic Sinica, Beijing, China, Dec., 2001.

*fractional and composite particles in condensed matter.*

Zhejiang Univ., China, Dec., 2001.

*fractional and composite particles in condensed matter.*

Hong Kong Univ., Dec., 2001.

*Theory for insulating vanadium oxide.*

Workshop of strongly correlated systems, Synchrotron Radiation Research Center, Hsinchu, Taiwan, (Oct. 31 -Nov. 1, 2001).

*Theory for insulating vanadium oxide.*

Workshop of Novel Quantum Phenomena in Transition Metal Oxides, Sendai, Japan, (August, 2001).

*Magnetic systems with orbital degree of freedom.*

ICTP, Trieste, Italy, August, 2001.

*Recent developments in Mott insulator vanadium oxides.*

The Third Oversea Chinese Physical Society Workshop, Hong Kong, (August, 2000).

*Magnetic systems with orbital degree of freedom.*

Advanced Study Center, Tsinghua Univ., Beijing, China, July, 2000.

*item Microscopic model for high Tc superconductivity.*

Advanced Study Center, Tsinghua Univ., Beijing, China, (July, 2000).

*Strongly correlated electrons in condensed matter.*

Fudan Univ., China, June, 2000.

*Theory for rare earth hydrides with switchable optical properties.*

Ohio University, Sept., 1999.



*Theory for rare earth hydrides with switchable optical properties.*

Hong Kong Baptist University, June, 1999.

*Theory for rare earth hydrides with switchable optical properties.*

Hong Kong University, June, 1999.

*Theory for rare earth hydrides with switchable optical properties.*

Latsis Symposium on the Physics and Chemistry of Novel Materials:  
Strongly Correlated Electron Systems, Monte Verita, Ascona, Switzerland .(June 6-11, 1999)

*Theory for rare earth hydrides with switchable optical properties.*

Oklahoma State University, Mar. , 1999.

*SU(4) theory for spin systems with orbital degeneracy.*

Oklahoma State University, Mar. , 1999.

*SU(4) theory for spin systems with orbital degeneracy.*

University of Sabatier, Toulouse, France, Feb. , 1999.

*Theory for rare earth hydrides with switchable optical properties.*

University of Sabatier, Toulouse, France, Jan. , 1999.

*SU(4) theory for spin systems with orbital degeneracy.*

ETH-Zurich, Switzerland, July, 1998.

*Theory for rare earth hydrides with switchable optical properties.*

Penn State Univ., Mar. 2, 1998.

*Theory for rare earth hydrides with switchable optical properties.*

Invited Symposium talk in American Physical Society March Meeting,  
Kansas City, (Mar. 19, 1997).

*Theory for rare earth hydrides with switchable optical properties.*

Fifth International Monbuscho Workshop in Strongly Correlated Electron Systems,  
Engelberg, Switzerland, (Mar. 9-12, 1997).

*Theory for rare earth hydrides with switchable optical properties.*

National Jiao-Tong University, Taiwan, Dec. 1996.

*Theory for rare earth hydrides with switchable optical properties.*

Institute of Physics, Taipei, Taiwan, Dec. 1996.

*Theory for rare earth hydrides with switchable optical properties.*

National Tsinghua University, Taiwan, Dec. 1996.

*Excitons in Mott insulator and electron energy loss spectrum in insulating Cu-oxides.*  
Bell Labs, Oct. 29, 1996.

*Theory for rare earth hydrides with switchable optical properties.*  
International Center for Theoretical Physics, Trieste, Italy, (July, 1996).

*New Particles in Condensed Matter Physics.*  
Tsinghua Univ. Taiwan (1996).

*Phase Transitions in Double Layer Antiferromagnetic Heisenberg Model.*  
Institute of Physics, National Academic Sciences, Taiwan (1996).

*Skyrmions in quantum Hall effect.*  
Theoretische Physik, ETH, Zurich, Switzerland (1996).

*High Temperature Superconductivity.*  
Hong Kong University of Science and Technology, Hong Kong (1995).

*Frustrated Spin Systems with Orbital Degeneracy |  $LiNiO_2$*   
ATT Bell Labs., Murray Hill, NJ, USA (1994).

*Superconductivity in quasi-one-Dimensional Cuprates.*  
Nagoya University, Nagoya, Japan (1994).

*Superconductivity in quasi-one-Dimensional Cuprates.*  
University of Michigan, Ann Arbor, Michigan, USA (1994).

*Models and Puzzles in High  $T_c$  Superconductivity.*  
Japanese Physical Society Meeting, Shizuoka, Japan (summer, 1994).

*Superconductivity in quasi-one-Dimensional Cuprates.*  
High  $T_c$  Workshop, Aspen Center for Physics, Aspen, CO, USA (1994).

*Anyons in Quantum Hall Effect.*  
Yukawa Institute of Theoretical Physics, Kyoto University, Japan (summer, 1994).

*Anyons in Quantum Hall Effect.*  
Tokyo University, Japan (summer, 1994).

*Anyons in Quantum Hall Effect.*  
Purdue University, Indiana, USA (1994);

*Models and Puzzles in High  $T_c$  Superconductivity.*  
Tokyo Institute of Technology, Tokyo, Japan (summer, 1994).

*Vortex Excitations in Cuprates Superconductors.*  
Hiroshima University, Hiroshima, Japan (summer, 1994).

*Superconductivity in Two-dimensional Electron Gas.*

University of Nevada, Las Vegas, USA (1993).

*Superconductivity in Two-dimensional Electron Gas.*

Hong Kong University of Science and Technology, Hong Kong (1993)

*Superconductivity in Two-dimensional Electron Gas.*

National Tsinghua University, Taiwan (1993)

*Anyons in Quantum Hall Effect.*

Institute of Physics, National Academic Sciences, Taipei, Taiwan (1993).

*Superconductivity in Two-dimensional Electron Gas.*

Taiwan Physical Society Annual Meeting, Taiwan (1993).

*Vortex Excitations in Cuprates Superconductors.*

University of California, San Diego (1992).

*Superconductivity in Two-dimensional Electron Gas.*

ETH, Zuerich, Switzerland (1992).

*Models and Puzzles in High T<sub>c</sub> Superconductivity.*

Oklahoma State University, Oklahoma, USA (1992).

*Anyons in Quantum Hall Effect.*

Univ. of Kentucky, Lexington, USA (1992).

*Anyons in Quantum Hall Effect.*

University of Utah, Salt Lake City, Utah, USA (1992).

*Anyons in Quantum Hall Effect.*

ETH, Zuerich, Switzerland (1991).

*Superconductivity in Doped C<sub>60</sub>.*

Virginia Tech., Blacksburg, Virginia, USA (1991).

*Superconductivity in Doped C<sub>60</sub>.*

Midwest Condensed Matter Theory Symposium, East Lansing, MI, USA (1991).

*Fractional Quantum Hall Effect.*

Indiana University, Bloomington, Indiana, USA (1990).

*Fractional Quantum Hall Effect.*

University of Wisconsin, Madison, Wisconsin, USA (1990).

*Fractional Quantum Hall Effect.*

Ohio State University, Columbus, Ohio, USA (1990).

*Fractional Quantum Hall Effect.*

ATT Bell Labs., Murray Hill, NJ, USA (1990).

*High Temperature Superconductivity.*

Michigan State University, East Lansing, USA (1990).

*High Temperature Superconductivity.*

University of Maryland, College Park, USA (1990).

*High Temperature Superconductivity.*

Argonne National Laboratories, USA (1990).

*High Temperature Superconductivity.*

University of Wisconsin, Madison, Wisconsin, USA (1989).

*High Temperature Superconductivity.*

Nobel Symposium 73, Sweden (1988).

*High Temperature Superconductivity.*

Midwest Condensed Matter Theory Workshop, Cincinnati, USA (1988).

*High Temperature Superconductivity.*

MIT, USA (1988).

*High Temperature Superconductivity.*

Princeton University, USA (1988).

*High Temperature Superconductivity.*

ETH, Zuerich, Switzerland (1988).

*High Temperature Superconductivity.*

Max-Planck Institute, Stuttgart, Germany (1987).

*High Temperature Superconductivity.*

Rome University, Italy (1987).

*High Temperature Superconductivity.*

5th International Conference on Many-body Physics, Finland (1987).

## Services

### University and Faculty/College levels

Member, Public Policy Board of Graduate School, Univ. of Hong Kong (2006 -2008 )

Member, Outstanding Young Scientist Award in Hong Kong (2006 -2008)

Panel Member of Research Grant Council in Hong Kong (2006 - present)

Member, Search Committee of Dean of Faculty of Science, Univ. of Hong Kong (2005)

President, Physical Society of Hong Kong (2005- 2007)

### Departmental

Chair of the graduate student committee, Univ. of Cincinnati (02 - 03); Co-

chair of graduate student committee, Univ of Cincinnati (01-02);

Chair of the New Faculty Search Committee, Univ. of Cincinnati (90-91, and 99-00);

### Scientific Reviewer for

Department of Energy, USA

National Science Foundation, USA;

Science

Nature

Review of Modern Physics

Physical Review Letters

Physical Review B

Journal of Physics: Condensed Matter, and A and D

Physical C

Journal of Modern Physics

Journal of Physical Society of Japan

## Major collaborators in recent years

T. M. Rice, ETH- Zurich, Switzerland

Wei-Qiang Chen, Univ. of Hong Kong, Hong Kong

Qiang-Hua Wang, Nanjing Univ., China

Yi Zhou, Zhejiang Univ., China

Jin-Hua Gao, Huazhong Univ. of Science and Technology, China

## Postdoc Trained

### Research Assistant Professor (RAP) and Postdocs:

Yong Ren (Postdoc 92-94)  
Kingshuk Majumda, (Postdoc 99-00)  
Y. Yamashita (Postdoc, Apr 02 - May 03)  
Yan Chen (RAP, 03-07)  
Xi Dai (RAP 04 - 07 )  
Kaiyu Yang (Sept 06 - Aug. 07), postdoc  
Weiqiang Chen (postdoc 06-08), and RAP 09 -11  
Hongbo Zhao (RAP, Nov. 06 - Oct. 09)  
Yi Zhou (Postdoc, Apr 07 - Mar 08)  
(and Postdoc Apr 09 - Mar 10)  
Jin-Hua Gao (Postdoc, Nov. 08 - Oct. 11)  
Xiao-Yong Feng (Postdoc, Apr 09- Feb 10)  
Zijian Yao (Postdoc, March 2011 - 2013)  
Hong Ming Jiang (Postdoc and visitor, March 2011 - 2013)  
Hao Guo (Postdoc, Oct. 2010 - 2012)  
Hao Wang (Postdoc, Sept. 2011 - 2013)  
Yong Wang (Postdoc, Sept. 2011 - 2015)  
Yan Zhou (RAP, Sept. 2011 - 2015)  
Dong-Hui Xu (Postdoc, Oct. 2012 - Oct. 2014)  
Jin-Hua Sun (Postdoc, Jul. 2013 - present)

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## Graduate students

### Graduate Students (Year of Ph. D.; position immediately after Ph. D.;

Yu-dong Zhu (Ph. D. Cincinnati, 94)	postdoc at Columbia University
Kwai Kong Ng (Ph. D. Cincinnati, 98)	Fellow of Japanese Educational Department at Kyoto Univ. Faculty member at Tong Hai University, Taiwan postdoc at Florida State Univ.
Anuvrat Joshi (Ph. D. Cincinnati, 01) (co-chaired with M. Ma)	
Theja M. De Silva (Ph. D. Cincinnati, 04) (co-chaired with M. Ma)	postdoc at Cornell Assist. Professor at NY State Univ., USA
Anup Mishra (Ph. D. Cincinnati, 04) (co-chaired with M. Ma)	postdoc at MPI
Jing-Yu Gan (Ph. D. at ITP, CAS, 05) (co-supervised with Z. B. Su )	Assoc. Prof., IOP, CAS, Beijing
Kaiyu Yang, (Ph. D. at HKU 06)	postdoc at ETH-Zurich
Huaibin Zhuang, Ph. D. at HKU, 07	postdoc at IOP, CAS
Siegfried Gurtler, Ph. D. at HKU, 08,	postdoc at Univ. of Bonn
Di Wu, MPhil, 08, HKU	SAP Research Division, Shanghai
P. N. Ma, MPhil, HKU, 09	Ph. D. at ETH-Zurich
X. F. FU, Ph. D. student HKU,	started in 2008 (co-supervised with Terry Hwa at UCSD and Ji
Kun Huang, Ph. D. student HKU	Ph. D. in 2013
Jia-Wei Huo, Ph. D. student HKU	Ph. D. in 2013
Jie Yuan, Ph. D. student HKU	Ph. D. in 2013
Q. E. Wang, Ph. D. student HKU	Ph. D. in 2014
Lun-Hui Hu, Ph. D. student at Zhejiang university	stated in 2013
Chuang Li, Ph. D. student at Zhejiang university	stated in 2014