

Curriculum Vitae

Shi-Jian Gu

Version: 2009-03-20

Personal information:

Date of Birth:	July 8, 1974	Address:	Room 217, Science Centre North Block,
Sex	Male		Physics Department, The Chinese University
Nationality:	China		of Hong Kong, Hong Kong, China.
Marital Status:	Married	Internet:	sjgu@phy.cuhk.edu.hk; www.phystar.net
		Tel	+852 - 2609 6301(o), 6576 0580(m)

Education:

B. Sc./ Ph. D. Zhejiang University, Hangzhou, China.

Position:

2005 -	Research Assistant Professor	The Chinese University of Hong Kong
2004 - 2005	Postdoctoral fellow	The Chinese University of Hong Kong
2002 - 2003	Postdoctoral fellow	Zhejiang University

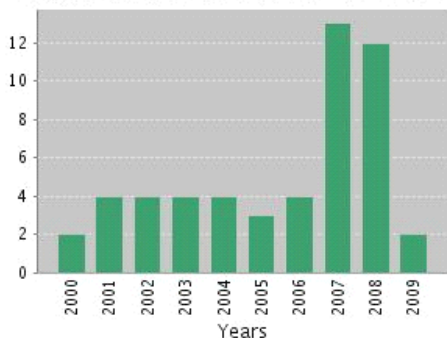
Prizes, awards, and related (see appendix):

2007	ISI evaluation: top 1% highly cited paper in the related field
2005	Top 100 excellent Ph.D. Thesis (2002) of China (The Ministry of Education, China)
2003	State award in natural science of China (2nd class, 5th investigator, The Ministry of Science and Technology of China)
2002	Excellent graduated Ph. D student of Zhejiang Province

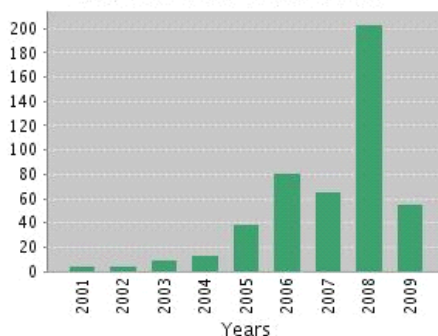
Academic record:

Total publications:	52	H index (ISI):	11
Journal distribution:	PRL(1), PR(19), EPL(2), NJP(1), CPL(5), others (24)		
Total citations (ISI):	476,		
Citation distribution (ISI):	113, 84, 31, 28, 26, 24, 18, 16, 15, 13, 11		

Published Items in Each Year



Citations in Each Year



Teaching

Lecture courses:

2006-2007, 2nd term: PHY1001, General Physics I

2007-2008, 2nd term: PHY1001, General Physics I

2008-2009, 1st term: PHY1001, General Physics I

Student trained

Mr. Wen-Ling Chan

Master

Publications:

1. *Effects of environmental parameters to total, quantum and classical correlations*,
Wen-Ling Chan, Jun-Peng Cao, Dong Yang, and **Shi-Jian Gu**, J. Phys. A: Math. Theor. 40 12143 (2007).
2. *Maximizing thermal entanglement of XY model using site-dependent magnetic fields in specific directions*,
Wen-Ling Chan, Dong Yang, and **Shi-Jian Gu** Chin. Phys. Lett. 25, 832 (2008).
3. *Entanglement and quantum phase transition in the asymmetric Hubbard chain: density-matrix renormalization group calculations*
Wen-Ling Chan and **Shi-Jian Gu**, J. Phys.: Condens. Matter 20 345217 (2008).

Mr. Ho-Man Kwok

Master

Publications:

1. *Quantum criticality of the Lipkin-Meshkov-Glick Model in terms of fidelity susceptibility*
Ho-Man Kwok, Wen-Qiang Ning, **Shi-Jian Gu**, and Hai-Qing Lin, Phys. Rev. E 78, 032103 (2008)
2. *Fidelity susceptibility, scaling, and universality in quantum critical phenomena*
Shi-Jian Gu, Ho-Man Kwok, Wen-Qiang Ning, and Hai-Qing Lin, Phys. Rev. B 77, 245109 (2008)
3. *Partial-state fidelity and quantum phase transitions induced by continuous level crossing*
Ho-Man Kwok, Chun-Sing Ho, **Shi-Jian Gu**, Phys. Rev. A 78, 062302 (2008)

Student under training

Name Topic of thesis

Wen-Long Lu Cold atoms in the one-dimensional optical lattice

Ching-Yee Leung Fidelity approach to quantum phase transitions.

Research

Research interest

- Quantum Information: Entanglement in many-body system; Quantification of entanglement, physical realization of quantum process.
- Condensed Matter Physics: Strongly correlated many-body System; Bose-Einstein condensation; exactly solvable models

Research projects (principle investigator)

1. 2005, Direct Grant: Entanglement in high spin systems, Project No. CUHK (A/C 2060286)
2. RGC(2006-2008): Quantum entanglement and quantum phase transitions in fermionic models, Project No. CUHK 400906
3. RGC(2007-2009): Towards a theory of correlation entropy in critical phenomena, Project No. CUHK 400807
4. 2008, Direct Grant: Fidelity in strongly correlated systems, Project No. CUHK (A/C 2060344)
5. RGC(2008-2010): Exploring novel quantum states in a one-dimensional boson-fermion mixture, Project No. CUHK401108

Professional service: organizing workshop

- 2007, 10 The Mini-workshop on the Frontiers of Computational Physics
- 2008, 6 Mini-workshop on exactly solvable models and their applications to cold-atom systems

Professional service: referee

- Journals in China: Chin. Phys. Lett.
- APS Journals: Phys. Rev. A; Phys. Rev. B
- IOP Journals: J. Phys. A; J. Phys. B; J. Phys. C; New J. Phys.
- Other European Journals: Euro. Phys. Lett.; Phys. Lett. A, IJMP

Invited talk (conference)

2005. 8 Workshop on condensed matter physics and statistical physics, Ningxia University, Yingchuan, China
Local entanglement and quantum phase transitions
2006. 3 March meeting of APS, Baltimore, USA (oral talk)
Local entanglement and quantum phase transitions in spin systems
2006. 7 2006 Workshop on Frontiers of Theoretical and Computational Physics and Chemistry, July 8, ZhaJiaJie HuNan China
Universal role of correlation entropy in critical phenomena
2006. 11 Workshop on condensed matter physics and statistical physics, Zhongshan University, Guangzhou, China
Phase separation in a mixture of two species fermionic atoms in 1D optical lattice

2007. 3 March meeting of APS, Denver, USA (oral talk)
Phase separation in a mixture of two species fermionic atoms in 1D optical lattice
2007. 5 Work shop on Quantum Manipulation and the Physics of Quantum Coherence
 Devices, Dailian University of Science and Technology, Dalian, Chian
The ground state of a mixture of two species fermionic atoms in 1D optical lattice
2008. 3 March meeting of APS, New Orleans, USA (oral talk)
Spin and charge velocities in the 1D boson-fermion mixture
- 2008, 4 Work shop on Quantum Manipulation and the Physics of Quantum Coherence
 Devices, Yangzhou, China
Fidelity susceptibility and quantum phase transitions
- 2008, 7 7th International Conference on Condensed Matters Theory and Computational
 Materials Science, Taiyuan, China,
Exact results of trapped Fermi gas
- 2008, 11 Workshop on "Correlations and Coherence in Quantum Matter", Evora, Portugal,
Fidelity susceptibility and quantum phase transitions
- 2008,12 HK Forum of Physics 2008 - Quantum Matters and Quantum Simulation
Fidelity susceptibility and quantum phase transitions

Selected publication by topics (out of 48 publications)

A. Quantum phase transitions: an entanglement perspective

1. *Entanglement, quantum phase transition, and scaling in the XXZ chain*
Shi-Jian Gu, H. Q. Lin, and Y. Q. Li, Phys. Rev. A 68, 042330(2003).
 ISI Citations: 84
2. *Entanglement and quantum phase transition in the extended Hubbard model*
Shi-Jian Gu, S. S. Deng, Y. Q. Li, and H. Q. Lin, Phys. Rev. Lett. 93, 086402 (2004).
 ISI Citations: 113
3. *The ground state entanglement in the XXZ model*
Shi-Jian Gu, G. S. Tian, and Hai-Qing Lin, Phys. Rev. A 71, 052322, (2005)
 ISI Citations: 26
4. *The entanglement in Heisenberg chain with next-nearest-neighbor interaction*
Shi-Jian Gu, Haibin Li, You-Quan Li, and Hai-Qing Lin, Phys. Rev. A 70, 052302
 (2004).
 ISI Citations: 24

B. Quantum phase transitions: a geometric perspective

5. *Fidelity, dynamic structure factor, and susceptibility in critical phenomena*
 Wen-Long You, Ying-Wai Li, and **Shi-Jian Gu**, Phys. Rev. E 76, 022101(2007)
 ISI Citations: 31
6. *Fidelity and quantum phase transition for the Heisenberg chain with the next-nearest-neighbor interaction*
 Shu Chen, Li Wang, **Shi-Jian Gu**, and Yupeng Wang, Phys. Rev. E **76**, 061108 (2007).
 ISI Citations: 28

7. *Fidelity susceptibility, scaling, and universality in quantum critical phenomena*
Shi-Jian Gu, Ho-Man Kwok, Wen-Qiang Ning, and Hai-Qing Lin, Phys. Rev. B **77**, 245109 (2008).
 ISI citations: 13
8. *Fidelity susceptibility in the ground state of Kitaev honeycomb model*
 Shuo Yang, **Shi-Jian Gu**, Chang-Pu Sun, Hai-Qing Lin, Phys. Rev. A **78**, 012304 (2008)
 ISI citations: 6
9. *Fidelity approach to quantum phase transitions*
 Shi-Jian Gu, arXiv:0811.3127 (a review article on fidelity)

C. Exactly solvable models

10. *Exact results of the ground state and excitation properties of a two-component interacting Bose system*
 You-Quan Li, **Shi-Jian Gu**, Zu-Jian Ying, and U. Eckern, Europhys. Lett. 61(3), 268-374 (2003).
 ISI Citations: 14
11. *Magnetic properties of $SU(4)$ spin-orbital chain*
Shi-Jian Gu, You-Quan Li, Phys. Rev. B, 66, 092404 (2002).
 ISI Citations: 11
12. *Scaling study of the Metal-insulator transition in one-dimensional fermion systems*
Shi-Jian Gu, V. M. Pereira, and N. M. R. Peres, Phys. Rev. B, 66 235108 (2002).
 ISI Citations: 6

D. Strongly correlated systems and cold atoms

13. *Bosonization study of quantum phase transitions in the one-dimensional asymmetric Hubbard model*
 Z. G. Wang, Y. G. Chen, and **Shi-Jian Gu**, Phys. Rev. B 75, 165111 (2007)
 ISI Citations: 5
14. *The ground state of a mixture of two species of fermionic atoms in 1D optical lattice*
Shi-Jian Gu, Rui Fan, and Hai-Qing Lin, Phys. Rev. B 76, 125107 (2007).
 ISI Citations: 6

References

1. Prof. Hai-Qing Lin
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博士学位证书

顾世建 浙江

人，一九七四年七月

八日生。在我校



物理学学科（专业）已通过
博士学位的课程考试和论文答辩，成
绩合格。根据《中华人民共和国学位
条例》的规定，授予 理学 博士
学位。

浙江大 学 校 长

潘 爱 德

学位评定委员会主席

潘 爱 德

2002年 7 月 16 日

证书编号 103352020355



国家自然科学奖 证书

为表彰国家自然科学奖获得者，特
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奖励等级：二等

获 奖 者：顾世建(浙江大学)



证书号：2002-Z-102-2-03-05

证书

顾世建：

您的《低维强关联多体系统的非微扰研究》被评为
2005 年全国优秀博士学位论文。



编号：2005046

二零零五年十月

Note added: up to now, the paper has been obtained 113 citations according to web of science.



Congratulations, Gu SJ

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Entanglement and quantum phase transition in the
extended Hubbard model



Dear Gu SJ

It's time to celebrate!

Since 2000, you have had 53 citations to your article,
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Hubbard model

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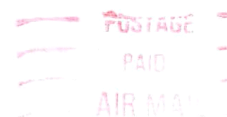
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Gu SJ
Physics

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