

CURRICULUM VITAE

GUO-YONG XIANG

DEMOGRAPHIC INFORMATION

Name: Xiang Guo-Yong Sex: Male

Birthplace: Anhui, P. R. China

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EDUCATION INFORMATION

Sep. 2000 – June 2005

Ph. D. in quantum optics and quantum information,

Key laboratory of quantum information, University of Science and
Technology of China. **Supervisor:** Prof. Guang-Can Guo.

Dissertation: *Realization of Quantum Information Processing via
Photons.*

Sep. 1996 – July 2000

Bachelor student, Department of Physics, Anhui normal university

EXPERIENCE

Oct. 2012 – now, Professor, Key lab of Quantum information, University
of Science and Technology of China.

Sep. 2010 – Sep. 2012, Associate professor, Key lab of Quantum
information, University of Science and Technology of China.

Nov. 2007 – Jul. 2010, Research fellow, Centre for Quantum Dynamics, Griffith University, Australia

Jun. 2005 – Nov. 2007, Post doctor fellow, Key laboratory of quantum information, University of Science and Technology of China.

Feb. 2006 – July 2006, Teaching assistant (Atomic Physics), Department of physics, University of Science and Technology of China.

Sep. 2000 – Jan. 2001, Teaching assistant (General Physics), Department of physics, University of Science and Technology of China.

PUBLICATION

49. J. F. Tang, Z. Hou, J. W. Shang*, H. Zhu, **G. Y. Xiang***, C. F. Li, G. C. Guo, Experimental Optimal Orienteering via Parallel and Antiparallel Spins, *Phys. Rev. Lett.* **124**, 060502 (2019);

48. J. F. Tang, Z. Hou, Q. F. Xu, **G. Y. Xiang***, C. F. Li, G. C. Guo, *Polarization-Independent Coherent Spatial-Temporal Interface with Low Loss*, *Phys. Rev. Applied* **12**, 064058 (2019);

47. Z. Hou, R. J. Wang, J. F. Tang, H. Yuan*, **G. Y. Xiang***, C. F. Li, G. C. Guo, *Control-Enhanced Sequential Scheme for General Quantum Parameter Estimation at the Heisenberg Limit*, *Phys. Rev. Lett.* **123**, 040501 (2019);

46. Y. Y. Zhao, **G. Y. Xiang***, X. M. Hu, B. H. Liu*, C. F. Li, G. C. Guo, R. Schwonnek*, and R. Wolf*, *Entanglement Detection by Violations of Noisy Uncertainty Relations: A Proof of Principle*, *Phys. Rev. Lett.* **122**, 220401 (2019);

45. K. D. Wu, Y. Yuan, **G. Y. Xiang***, C. F. Li, G. C. Guo, M. Perarnau-Llobet*, *Experimentally reducing the quantum measurement back action in work distributions by a collective measurement*, *Science Advances* **5**, eaav4944 (2019);

44. Y. Wang, Q. Yin, D. Dong*, B. Qi, I. R. Petersen, Z. Hou, H. Yonezawa, **G. Y. Xiang**, *Quantum gate identification: Error analysis, numerical results and optical experiment*, *Automatica* **101**, 269((2019));
43. S. Yu, C. J. Huang, J. S. Tang*, Z. A Jia, Y. T. Wang, Z. J. Ke, W. Liu, X. Liu, Z. Q. Zhou, Z. D. Cheng, J. S. Xu, Y. C. Wu, Y. Y. Zhao, **G. Y. Xiang***, C. F. Li*, G. C. Guo, G. Sentís*, and R. Muñoz-Tapia, *Experimentally detecting a quantum change point via the Bayesian inference*, *Phys. Rev. A*. **98**, 040301(R) (2018);
42. K. D. Wu, Z. Hou, Y. Y. Zhao, **G. Y. Xiang***, C. F. Li and G. C. Guo, J. Ma, Q. Y. He, J. Thompson, and M. Gu*, *Experimental Cyclic Interconversion between Coherence and Quantum Correlations*, *Phys. Rev. Lett.* **121**, 050401 (2018);
41. Y. Yuan, Z. Hou, K. D. Wu, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Experimental retrodiction of trajectories of single photons in double interferometers*, *Phys. Rev. A*. **97**, 062115 (2018);
40. X. M. Hu, B. H. Liu, Y. Guo, **G. Y. Xiang**, Y. F. Huang, C. F. Li, G. C. Guo, M. Kleinmann, T. Vertes and A. Cabello, *Observation of stronger-than-binary correlations with entangled photonic qutrits*, *Phys. Rev. Lett* **120**, 180402 (2018) ;
39. Z. Hou, J. F. Tang, J. Shang, H. Zhu*, J. Li, Y. Yuan, K. D. Wu, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Deterministic realization of collective measurements via photonic quantum walks*, *Nature Communications* **9** , 1414(2018);
38. Q. Yin, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Compressed Sensing Quantum State Tomography Assisted by Adaptive Design*, *Chin. Phys. Lett.* **35**, 070302(2018);
37. Y. Yuan, Z. Hou, Y. Y. Zhao, H. S. Zhong, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Experimental demonstration of wave-particle duality relation based on coherence measure*, *Optics Express* **26**, 4470 (2018)

36. B. Qi, Z. Hou, Y. Wang, D. Dong, H. S. Zhong, L. Li, **G. Y. Xiang***, H. W. Wiseman, C. F. Li and G. C. Guo, *Adaptive quantum state tomography via linear regression estimation: Theory and two-qubit experiment*, npj Quantum Information **3**, 19 (2017)
35. Y. Y. Zhao, P. Kurzynski*, **G. Y. Xiang***, C. F. Li and G. C. Guo, Heisenberg's error-disturbance relations: A joint measurement-based experimental test, Phys. Rev. A. **95**, 040101 (2017)
34. K. D. Wu, Z. Hou, H. S. Zhong, Y. Yuan, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Experimentally obtaining maximal coherence via assisted distillation process*, Optica **4**, 454 (2017)
33. Y. Y. Zhao, Z. Hou, **G. Y. Xiang***, Y. J. Han, C. F. Li and G. C. Guo, *Experimental demonstration of efficient quantum state tomography of matrix product states*, Optics Express **25**, 9010 (2017)
32. Y. Y. Zhao, M. Grassl, B. Zeng, **G.Y. Xiang***, C. Zhang C. F. Li and G. C. Guo, *Experimental detection of entanglement polytopes via local filters*, npj Quantum Information **3**, 11 (2017)
31. Q. Yin, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Improving Accuracy of Estimating Two-Qubit States with Hedged Maximum Likelihood*, Chinese Physics Letters **34**, 030301 (2017)
30. Q. Yin, L. Li, X. Xiao, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Experimental demonstration of real-time adaptive one-qubit quantum-state tomography*, Phys. Rev. A **95**, 012129 (2017)
29. Z. B. Hou, H. S. Zhong, Y. Tian, D. Y. Dong, B. Qi, L. Li, Y. L. Wang, F. Nori, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Full reconstruction of a 14-qubit state within four hours*, New Journal of Physics **18**, 083036 (2016)
28. Z. B. Hou, H. J. Zhu, **G. Y. Xiang***, C. F. Li and G. C. Guo, Error-compensation measurements on polarization qubits, JOSAB **33**, 1256 (2016)

27. Z. B. Hou, H. J. Zhu*, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Achieving quantum precision limit in adaptive qubit state tomography*, npj Quantum Information **2**, 16001 (2016)
26. Y. Y. Zhao, Y. C. Wu*, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Experimental violation of the local realism for four-qubit Dicke state*, Optics Express **23**, 30491(2015)
25. J. Qiu, J. S. Pan, **G. Y. Xiang**, Y. S. Zhang, S. S. Han and Y. Z. Gui, *Even- and odd-order dispersion cancellation effects in a two-photon interferometer*, JOSAB **32**, 907 (2015)
24. Z. B. Hou, **G. Y. Xiang***, D. Y. Dong, C. F. Li and G. C. Guo, *Realization of mutually unbiased bases for a qubit with only one wave plate: theory and experiment*, Optics Express **23**, 10018(2015)
23. Y. Y. Zhao, N. K. Yu, P. Kurzynski, **G. Y. Xiang***, C. F. Li and G. C. Guo, *Experimental realization of generalized qubit measurement based on quantum walks*, Phys. Rev. A **91**, 042101 (2015)
22. J. Qiu, Y. S. Zhang, **G. Y. Xiang**, S. S. Han and Y. Z. Gui, *Unified view of the second-order and the fourth-order interferences in a single interferometer*, Optics Communications, **336**, 9(2015)
21. D. S. Ding, W. Zhang, Z. Y. Zhou, S. Shi, **G. Y. Xiang**, X. S. Wang, Y. K. Jiang, B. S. Shi and G. C. Guo, *Quantum Storage of Orbital Angular Momentum Entanglement in an Atomic Ensemble*, Phys. Rev. Lett. **114**, 050502(2015)
20. B. L. Higgins, M. S. Palsson, G. Y. Xiang, H. M. Wiseman and G. J. Pryde, *Using weak values to experimentally determine "negative probabilities" in a two-photon state with Bell correlations*, Phys. Rev. A **91**, 012113 (2015)
19. J. Qiu, **G. Y. Xiang**, Y. S. Zhang, S. S. Han and Y. Z. Gui, *Even- and odd-order dispersion cancellation effects in four-photon quantum interferometry*, Chinese Optics Letters **12**, 112701 (2014)

18. D. S. Ding, W. Zhang, Z. Y. Zhou, S. Shi, J. S. Pan, **G. Y. Xiang**, X. S. Wang, Y. K. Jiang, B. S. Shi and G. C. Guo, *Toward high-dimensional-state quantum memory in a cold atomic ensemble*, Phys. Rev. A **90**, 042301 (2014)
17. **G. Y. Xiang**, Z. Hou, C. F. Li and G. C. Guo, *Entanglement distribution in optical fibers assisted by nonlocal memory effects*, EPL **107**, 54006 (2014)
16. B. Qi, Z. B. Hou, L. Li, D. Y. Dong, **G. Y. Xiang*** and G. C. Guo, *Quantum state tomography via linear regression estimation*, Scientific Reports **3**, 3496 (2013)
15. **G. Y. Xiang** and G. C. Guo, *Quantum metrology*, Chinese Physics B **22**, 110601 (2013)
14. **G. Y. Xiang**, H. F. Hofmann and G. J. Pryde, *Optimal multi-photon phase sensing with a single interference fringe*, Scientific Reports **3**, 2684 (2013)
13. S. Kocsis, **G. Y. Xiang**, T. C. Ralph and G. J. Pryde, *Heralded noiseless amplification of a photon polarization qubit*, Nature Physics **9**, 23(2013)
12. J. S. Tang, Y. L. Li, X. Y. Xu, **G. Y. Xiang**, C. F. Li and G. C. Guo, *Realization of quantum Wheeler's delayed-choice experiment*, Nature Photonics **6** 600 (2012);
11. **G. Y. Xiang**, B. L. Higgins, D. W. Berry, H. M. Wiseman, and G. J. Pryde, *Entanglement-enhanced measurement of a completely unknown optical phase*, Nature Photonics **5** 43 (2011);
10. D. W. Berry, **G. Y. Xiang**, B. L. Higgins, H. M. Wiseman, and G. J. Pryde, *Entanglement-enhanced measurement of a completely unknown optical phase*, **2010 Conference on Lasers and Electro-Optics (CLEO) AND Quantum Electronics and Laser Science Conference (QELS)**;
9. **G. Y. Xiang**, T. C. Ralph, A. P. Lund, N. Walk, and G. J. Pryde,

Noiseless linear amplification and distillation of entanglement, Nature Photonics **4** 316 (2010);

8. X. L. Niu, Y. F. Huang, **G. Y. Xiang**, G. C. Guo, and Z. Y. Ou, *Beamlike high-brightness source of polarization-entangled photon pairs*, Optics Letters **33**, 968(2008);

7. **G. Y. Xiang**, Y. F. Huang, F. W. Sun, P. Zhang, Z. Y. Ou, and G. C. Guo, *Demonstration of Temporal Distinguishability in a Four-Photon State and a Six-Photon State*, Phys. Rev. Lett **97**, 023604 (2006) ;

6. S. F. Huelga, M. B. Plenio, **G. Y. Xiang**, J. Li, G. C. Guo, *Remote implementation of quantum operations*, Jour. of Opt. B **7**, s384-s391 (2005) ;

5. **G. Y. Xiang**, J. Li, G. C. Guo, *Teleporting a rotation on remote photons*, Phys. Rev. A **71**, 044304 (2005) ;

4. **G. Y. Xiang**, J. Li, B. Yu, G. C. Guo, *Remote preparation of mixed state via noisy entanglement*, Phys. Rev. A **72**, 012315 (2005);

3. **G. Y. Xiang**, J. Li, G. C. Guo, *Remote state preparation and operation for photons*, **Quantum Optics and Application In Computing and Communication II 5631**, 112 (2005);

2. **G. Y. Xiang**, Y. S. Zhang, J. Li, G. C. Guo, *Scheme for preparation of the W-state by using linear optic elements*, Jour. of Opt. B **5**, 208 (2003);

1. B. Yu, Z. W. Zhou, Y. Zhang, **G. Y. Xiang**, G. C. Guo, *Robust high-fidelity teleportation of an atomic state through the detection of cavity decay*, Phys. Rev. A **70**, 014302 (2004);

CONFERENCE ORAL AND POSTER TALK

1. *The effect on visibility of fourth-order interference from thickness of II type crystal*, **G. Y. Xiang**, J. Li, G. C. Guo, The 10th Quantum Optics and Quantum Information Conference, Wuyishan, China, on Aug.

2002. (oral talk)
2. *Remote state preparation via noisy entanglement*, **G. Y. Xiang**, J. Li, G. C. Guo, The 11th Quantum Optics and Quantum Information Conference, Dujiangyan, China, on Aug. 2004. (oral talk)
 3. *Remote state preparation and operation for photons*, **G. Y. Xiang**, J. Li, B. Yu, G. C. Guo, Quantum Optics and Applications in Computing and Communications II, SPIE, 10-12 November 2004, Beijing, China. (oral talk)
 4. *Remote preparation of any single photon state via noisy entanglement*, **G. Y. Xiang**, J. Li, G. C. Guo, ERATO conference on Quantum Information Science 2005, Augst 26-30, Tokyo, Japan. (oral talk)
 5. *Interference of quantum channels*, **G. Y. Xiang**, J. Li, G. C. Guo, The 12th Quantum Optics and Quantum Information Conference, Nanchang, China, on Aug. 2006. (oral talk)
 6. *Demonstration of temporal distinguishability in a four-photon state and a six-photon state*. **G. Y. Xiang**, Y. F. Huang, F. W. Sun, P. Zhang, Z. Y. Ou, and G. C. Guo, Asian Conference on Quantum Information Science 2006 September 1-4, 2006 - BeiJing Friendship Hotel, BeiJing, China. (poster talk)
 7. *Phase estimation using the wedge entangled state*, **G. Y. Xiang**, B. L. Higgins, H. F. Hofmann, and G. J. Pryde, Australian Institute of Physics(AIP) 14th National Congress. 30th, Nov -5th, Dec. 2008. The University of Adelaide, Australia. (oral talk)
 8. *Noiseless Linear Amplification and Distillation of Entanglement*. **Guoyong Xiang**, T. C. Ralph, A. P. Lund, N. Walk and G. J. Pryde, 9th Asian Conference on Quantum Information Science. 26th-29th, Sep. 2009. Nanjing University of Posts & Telecommunications (NUPT), Nanjing, China. (35 minutes long talk)
 9. *Phase estimation using four- and six-photon Holland-Burnett states*.

- The Tenth International Conference on Quantum Communication, Measurement and Computation (QCMC2010). 19th-23th, July 2010, University of Queensland, Brisbane, Australia. (poster talk)
10. *Optimal multi-photon phase sensing with a single interference fringe.* **G. Y. Xiang**, H. F. Hofmann, and G. J. Pryde, Quantum Information and Measurement (QIM). March 19-21, 2012. Messe Berlin in Berlin, Germany. (oral talk)
 11. *Quantum state reconstruction via linear regression estimation.* B. Qi, Z. B. Hou, L. Li, D. Y. Dong, **G. Y. Xiang**, G. C. Guo. Workshop on Mathematical Methods of Quantum Tomography, February 19-22, 2013. Fields Institute, 222 College St., Toronto, Canada. (oral talk)
 12. *Quantum precision measurement with entangled photons.* **G. Y. Xiang**, 2013 International Workshop for Control of Coherence. October 6-8, 2013. USTC, Hefei, China. (invited talk)
 13. *Experimental research on quantum precision measurement and its application.* **G. Y. Xiang**, The Third Forum for Young Scientists From Atom, Molecule and Optics field. October 26-27, 2013. East China Normal University, Shanghai, China. (invited talk)
 14. *Memory assisted entanglement distribution,* **G. Y. Xiang**, Quantum Information and Measurement (QIM). March 18-20, 2014. Messe Berlin in Berlin, Germany. (oral talk)
 15. *Quantum precision measurement,* **G. Y. Xiang**, Optics Frontier—The 6th National Conference on Information Optics and Photonics and the International Workshop on Information Optics Technology, July 22-27, 2014. Changchun, China. (invited talk)
 16. *Experimental verification of quantum precision limit in adaptive qubit state tomography,* **G. Y. Xiang**, The 16th Quantum Optics and Quantum Information Conference, 3rd-6th August, 2014, Yanbian, China. (oral talk)

17. *Adaptive quantum state tomography*, **G. Y. Xiang**, The Third China-Australia co-workshop on quantum control, Sep. 29-Oct. 2, 2014, Brisbane, Australia. (invited talk)
18. Precise measurement of quantum states, **G. Y. Xiang**, The first conference on condensed physics, July 14-17, 2015, Beijing, China. (invited talk)
19. *Measurement of a photon 88 ns before it is created*, **G. Y. Xiang**, Optoelectronics Global Conference 2016, Sep. 5-7, 2016, Shenzhen, China. (invited talk)
20. *Measurement of a photon 88 ns before it is created*, **G. Y. Xiang**, The 17th Quantum Optics and Quantum Information Conference, Aug. 5-8, 2016, Lanzhou, China. (oral talk)
21. *Experimental detection of entanglement polytopes via local filters*, **G. Y. Xiang**, The Tenth International Conference on Quantum Communication Measurement and Computation (QCMC2016), July 4-8, 2016, Singapore. (poster talk)
22. *Adaptive quantum state tomography via linear regression estimation: Theory and two-qubit experiment*, **G. Y. Xiang**, Gordon Research Conference (GRC): Quantum Control of Light and Matter, August 6-11, 2017, South Hadley, USA. (poster talk)
23. *Deterministic realization of high efficient collective measurements via photonic quantum walks*, **G. Y. Xiang**, Workshop on Frontiers in Optics, Sep. 15-17, 2017, Suzhou, China (invited talk)
24. *Experimental progress on quantum coherence as quantum resource*, **G. Y. Xiang**, Workshop on Quantum Resources and Correlations Beyond Entanglement, Dec. 11-13, 2017, Singapore (invited talk)
25. *Deterministic realization of collective measurements via photonic quantum walks*, **G. Y. Xiang**, International Workshop on Quantum Tomography (IWQT), July. 30-Aug.3, 2018, Shanghai, China (invited

talk)

26. *Deterministic realization of collective measurements via photonic quantum walks*, **G. Y. Xiang**, the 8th International Multidisciplinary Conference on Optofluidics (IMCO 2018), Aug. 5-8, 2018, Shanghai, China (invited talk)
27. *Control-enhanced estimation of non-commuting Hamiltonian at the Heisenberg limit*, **G. Y. Xiang**, SPIE/COS Photonics Asia 2018, Oct. 11-13, 2018, Beijing, China (invited talk)
28. *Simultaneously optimal multi-parameter estimation without tradeoff via quantum control*, **G. Y. Xiang**, the 18th Quantum Optics Research conference, Oct. 26-29, 2018, Zhangjiajie (invited talk)
29. *Heisenberg-limit control-enhanced sequential scheme for general quantum parameter estimation*, **G. Y. Xiang**, Asia Communications and Photonics Conference (ACP) 2018, Oct. 26-29, 2018, Hangzhou, China (invited talk)
30. *Quantum controlled optimal multi-parameter estimation*, Guo-Yong Xiang, 1st qSET (Quantum Science, Engineering and Technology), 8-11 April, 2019, Canberra, Australia (invited talk)
31. *Zero-tradeoff multi-parameter estimation from multiple Heisenberg uncertainty relations*, **G. Y. Xiang**, The 2019 Quantum Sensing Gordon Research Conference, 2-7 June, 2019, Hong Kong (Poster talk)
32. *Quantum controlled optimal multi-parameter estimation*, **G. Y. Xiang**, The 5th Conference on Condensed Matter Physics, 27–30 June, 2019, Liyang, Jiangsu Province, China (invited talk)
33. *Quantum coherence resource theory and its application*, **G. Y. Xiang**, The 18th International Conference on Optical Communications and Networks (ICOON'2019), Aug. 5-8, 2019, Huangshan, China (invited talk)
34. *Quantum coherence resource theory and its application*, **G. Y.**

Xiang, Optics Frontier—The 11th International Conference on Information Optics and Photonics (CIOP 2019), August 6-9, 2019, Xi'an, Shanxi province, China(Invited talk)

35. *Towards two-dimensional superresolution imaging with incoherent illumination*, **G. Y. Xiang**, The 2019 Academic Conference of The Chinese Optical Society, August 9-12, 2019, Hefei, Anhui province, China (Invited talk)

36. *Quantum collective measurement*, **G. Y. Xiang**, 1st Chinese Conference for Quantum Information and Technology, August 21-24, 2019, Chuzhou, Anhui province, China (Invited talk)

37. *Zero-tradeoff multi-parameter estimation from multiple Heisenberg uncertainty relations*, **G. Y. Xiang**, 2019 Atomic Precision Measurement Conference, Oct. 26-27, Zhuhai, Guangdong province, China (Invited talk)

38. *Zero-tradeoff multi-parameter estimation from multiple Heisenberg uncertainty relations*, **G. Y. Xiang**, Photonics & Electromagnetics Research Symposium (PIERS 2019), Dec.17-20, Xiamen, Fujian province, China (Invited talk)