Publications Christian Kurtsiefer *(as of 5.12.2009)*

Articles in peer-reviewed journals

1. H.S. Poh, J. Lim, I. Marcikic, A. Lamas-Linares, C. Kurtsiefer: *Eliminating Spectral Distinguishability in Ultrafast Spontaneous Parametric Down-conversion*, Phys. Rev. A **80**, 043815 (2009).
2. S.A. Aljunid, M. K. Tey, B. Chng, T. Liew, G. Maslennikov, V. Scarani, and C. Kurtsiefer: *Phase shift of a weak coherent beam induced by a single atom*, Phys. Rev. Lett. **103**, 153601 (2009).
3. C. Ho, A. Lamas-Linares, and C. Kurtsiefer: *Clock synchronization by remote detection of correlated photon pairs*, N. J. Phys. **11**, 045011 (2009).
4. M. P. Peloso, I. Gerhardt, C. Ho, A. Lamas-Linares, and C. Kurtsiefer: *Daylight operation of a free space, entanglement-based quantum key distribution system*, N.J.Phys. **11**, 045007 (2009).
5. M.K. Tey, G. Maslennikov, T.C.H. Liew, S.A. Aljunid, F. Huber, B. Chng, Z. Chen, V. Scarani, and C. Kurtsiefer:*Interfacing light and single atoms with a lens*, N. J. Phys. **11**, 043011 (2009)
6. M.K. Tey, Z. Shen, S.A. Aljunid, B. Chng, F. Huber, G. Maslennikov and C. Kurtsiefer: *Strong interaction between light and a single trapped atom without the need for a cavity*, natue physics **4**, 924-927 (2008).
7. T. Durt, C. Kurtsiefer, A. Lamas-Linares, and A. Ling, *Wigner tomography of two-qubit states and quantum cryptography*, Phys. Rev. A **78**, 042338 (2008).
8. A. Ling, M. Peloso, I. Marcikic, A. Lamas-Linares, V. Scarani, and C. Kurtsiefer: Experimental quantum key distribution based on a Bell test, Phys. Rev. A **78**, 020301(R), (2008).
9. C. Branciard, N. Brunner, N. Gisin, A. Lamas-Linares, A. Ling, C. Kurtsiefer and V.Scarani: *Testing quantum correlations versus single-particle properties within Leggett's model and beyond*, nature physics **4**, 681-685 (2008).
10. A. Ling, A. Lamas-Linares and C. Kurtsiefer: *Absolute emission of spontaneous parametric down conversion into single transverse Gaussian modes*, Phys. Rev. A **77**, 043834 (2008).
11. S. Gaertner, M. Bourennane, C. Kurtsiefer, A. Cabello and H. Weinfurter: *Experimental demonstration of a quantum protocol for Byzantine agreement and liar detection* , Phys. Rev. Lett. **100**, 070504 (2008).
12. C. Branciard, A. Ling, N. Gisin, C. Kurtsiefer, A. Lamas-Linares, and V. Scarani: *Experimental Falsification of Leggett's Non-Local Variable Model*, Phys. Rev. Lett. **99**, 210407 (2007).
13. J. Volz, M. Weber, D. Schlenk, W. Rosenfeld, C. Kurtsiefer, H. Weinfurter: *An atom and a photon*, Laser Physics **17**, 1007-1016 (2007).
14. A. Lamas-Linares, C. Kurtsiefer: *Breaking a quantum key distribution system through a timing side channel*, Optics Express **15**, 9388-9393 (2007).
15. H.S. Poh, C.Y. Lum, I. Marcikic, A. Lamas-Linares, C. Kurtsiefer: *Joint spectrum mapping of polarization entanglement in spontaneous parametric down-conversion*, Phys. Rev. A **75**, 043816 (2007).
16. T. Schmitt-Manderbach, H. Weier, M. Fürst, R. Ursin, F. Tiefenbacher, T. Scheidl, J. Perdigues, Z. Sodnik, C. Kurtsiefer, J.G. Rarity, A. Zeilinger, H. Weinfurter: *Experimental demonstration of free-space decoy-state quantum key distribution over 144 km*, Phys. Rev. Lett. **98**, 010504 (2007).
17. S. Gaertner, C. Kurtsiefer, M. Bourennane, and H. Weinfurter: *Experimental Demonstration of Four-Party Quantum Secret Sharing*, Phys. Rev. Lett. **98**, 020503 (2007).
18. Ivan Marcikic, Antía Lamas-Linares, and Christian Kurtsiefer: *Free-space quantum key distribution with entangled photons*, Appl. Phys. Lett. **89**, 101122 (2006).
19. H. Weier, T. Schmitt-Manderbach, N. Regner, Ch. Kurtsiefer, H. Weinfurter: *Free space quantum key distribution: Towards a real life application*, Fortschr. Phys. **54**, 840 - 845 (2006).
20. Alexander Ling, Kee Pang Soh, Antia Lamas-Linares, Christian Kurtsiefer: *Experimental polarization state tomography using optimal polarimeters*,Phys. Rev. A **74**, 22309 (2006).
21. Christian Schmid, Pavel Trojek, Sascha Gaertner, Mohamed Bourennane, Christian Kurtsiefer, Marek Zukowski, and HaraldWeinfurter: *Experimental quantum secret sharing*, Fortschr. Phys. **54**, 831-839 (2006).
22. Markus Weber, Juergen Volz, Karen Saucke, Christian Kurtsiefer, and Harald Weinfurter: *Analysis of a single-atom dipole trap*, Phys. Rev. A **73**, 043406 (2006).
23. Carsten Schuck, Gerhard Huber, Christian Kurtsiefer, and Harald Weinfurter: *Complete Deterministic Linear*

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24. Alexander. Ling, Kee Pang Soh, Antia Lamas-Linares, and Christian Kurtsiefer: *An optimal photon counting polarimeter*, J. Mod. Opt. **53**, 1523-1528 (2006).

25. M. Bourennane, M. Eibl, S. Gaertner, N. Kiesel, Ch. Kurtsiefer, and H. Weinfurter: *Entanglement Persistency of Multiphoton Entangled States*, Phys. Rev. Lett. **96**, 100502 (2006).

26. C. Wang, Ch. Kurtsiefer, H. Weinfurter and B. Burchard: *Single photon emission from SiV centres in diamond produced by ion implantation*, J. Phys. B **39**, 37-41 (2006).

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48. Ch. Kurtsiefer, M. Oberparleiter, and H. Weinfurter: *Generation of correlated photon pairs in type-II parametric down conversion -- revisited*, Journal of Modern Optics **48**, 1997-2007 (2001).

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54. T. Pfau, Ch. Kurtsiefer, J.Mlynek: *Double Slit Experiments with Correlated Atom-Photon States*, Journal of Quantum and Semiclassical Optics Opt. **8**, 665-671 (1996).

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Patents

1. Magiq technologies, M. Bourennane, C. Kurtsifer, C. Schmid, P. Trojek, H. Weinfurter, M. Zukowski: Single-particle quantum-enhanced secret sharing, PCT/US2006/000072, filed: 3.1.2006

2. Ch. Kurtsiefer, H. Weinfurter: *Vorrichtung und Verfahren für die Quantenkryptographie*, Patent Nr. 101 17 272.A1, Deutsches Patentamt (2001).

3. D.S. Bethune, R.G. Devoe, Ch. Kurtsiefer, C.T. Rettner, W.P. Risk: *System for gated detection of optical pulses containing a small number of photons using an avalanche photodiode*, U.S. Patent no. 6,218,657 B1

Proceedings

1. A. Ling, P. Y. Han, A. Lamas-Linares, and C. Kurtsiefer: *Preparation of Bell States with Controlled White Noise, Laser Physics*, Vol. 16, No. 7, 1140-1144 (2006).

2. John G. Rarity, Phil M. Gorman, P. R. Knight, Harald Weinfurter, and Christian Kurtsiefer: *Quantum communication in space*, Proc. SPIE Vol. 5161 (Quantum Communications and Quantum Imaging, R.E. Meyers, Y. Shih (eds.), pp. 240-251 (2004).

3. M. Bourennane, M. Eibl, S. Gaertner, N. Kiesel, Ch. Kurtsiefer, and H. Weinfurter: *Multiphoton entanglement;* S. Liu, G. Guo, H.-K. Lo, N. Imoto (eds.): Quantum optics in computing and communications, Proceedings SPIE 4917, pp. 45-53 (2002).

4. C. Kurtsiefer, P. Zarda, Matthäus Halder, P.M. Gorman, P.R. Tapster, J.G. Rarity, and H. Weinfurter: *Long distance free-space quantum cryptography* S. Liu, G. Guo, H.-K. Lo, N. Imoto (eds.): Quantum optics in computing and communications, Proceedings SPIE 4917, pp. 25-31 (2002).

5. A. Beige, B.-G. Englert, Ch. Kurtsiefer, and H. Weinfurter: *Communication with qubit pairs*, R. Brylinski, G. Chen (eds.): Mathematics of quantum computation, CRC Press, pp. 359 (2002).
6. M. Bourennane, M. Eibl, S. Gaertner, N. Kiesel, Ch. Kurtsiefer, M. Zukowski, and H. Weinfurter: *Multiphoton entanglement* G. Leuchs and T. Beth (eds.): Quantum Information Processing, VCH-Wiley, p. 292-299 (2002)
7. Christian Kurtsiefer, Markus Oberparleiter, Jürgen Volz, Harald Weinfurter: *Efficient Generation of Polarization-Entangled Photon Pairs with a Laser Diode Source*, Laser Physics at the limits, pp. 449-457. Springer Verlag (2001).
8. P. Zarda, C. Kurtsiefer, S. Mayer, Harald Weinfurter: *Stable Solid-State Source of Single Photons for Quantum Communication*, Computing and Measurement 3, p. 307, Kluwer Academic (2001).
9. Ch. Kurtsiefer, R.C. Spreeuw, M. Drewsen, M. Wilkens, J. Mlynek: *Classical and non-classical atom optics*, Adv. At. Mol. Opt. Phys. p. 171 (ed.:P. Berman) (1997).
10. T. Pfau, Ch. Kurtsiefer, C.R. Ekstrom, R.J.C. Spreeuw, M. Hartl, U. Janicke, M. Wilkens, and J. Mlynek: *"Non-classical" atom optics*, p. 529, Proc. of the Int. School of Physics "Enrico Fermi," Varenna, Course CXXXI on Coherent and Collective Interactions of Particles and Radiation Beams, eds: A. Aspect, W. Barletta, and R. Bonifacio, IOS Press (1996).
11. Ch. Kurtsiefer, T. Pfau, S. Spälter, C. R. Ekstrom, and J. Mlynek: *A Heisenberg microscope for atoms*, Ann. of the New York Acad. of Sci. **755**, 162 (1995).
12. T. Pfau, A. Schnetz, C.S. Adams, Ch. Kurtsiefer, M. Sigel, J. Mlynek: *"Diffraction of atoms from Optical potentials"*, Proc. of the workshop "Quantum Interferometry", Trieste, Italy; ed.: F. De Martini, G. Denardo, A. Zeilinger, (1993).
13. M. Sigel, T. Pfau, C.S. Adams, Ch. Kurtsiefer, W. Seifert, C. Heine, J.Mlynek: *"Optical Elements for atoms"*, Proc. of the 5th Meeting on Laser Phenomena, Kühtai, Austria; ed.: F. Ehlotzki, (1993).

Conferences

1. ICQIT 2009 - Int. Conf. on Quantum information and Technology, 2.-5. Dec 2009, NII Tokyo, Japan, *Implementation of an attack scheme on a practical QKD system*, invited talk
2. SPW09 - Single photon workshop 2009, 3.-6. Nov 2009, NIST Boulder, CO: *Substantial scattering of photons by a Single Atom*, invited talk
3. EQEC09-CLEO/Europe,14.-19. June 2009, Munich, Germany, *Substantial scattering of a Weak Coherent Beam by a Single Atom*, invited talk
4. SPIE Photonics West, 24.-29. January 2009, San Jose, CA: *Interfacing light and single atoms with a lens*, keynote presentation
5. UQC2008, 1.-2.December 2008, Akihabara Tokyo: *Status of R&D on Quantum communication and related R&D in Singapore*, invited talk
6. DEFCON 16, 8.-10. August 2008, Las Vegas: The Quantum Lounge (experimental exhibition of an entanglement-based QKD system)
7. Black Hat 2008, 2.-7. August 2008, Las Vegas: The Quantum Spookshow (experimental exhibition of an entanglement-based QKD system)
8. 17th International Laser Physics Workshop (LPHYS08), 30.June- 4.July 2008, Trondheim, Norway: *What can one do with single photons?* plenary talk
9. DAMOP2008 meeting, 27.-31. May 2008, Penn State (USA): *Strong Interaction Between Light and a Single Trapped Atom Without a Cavity*, co-authored talk
10. CLEO/QUELS 08, 4.-9. May 2008, San Jose, CA: *QFE6 Absolute Emission Rates of Spontaneous Parametric Down Conversion into a Single Transverse Gaussian Mode* co-authored talk
11. CLEO/QUELS 08, 4.-9. May 2008, San Jose, CA: *QTuB6 Strong Interaction between Light and a Single Trapped Atom without a Cavity* co-authored talk
12. 24th Chaos Communication Congres (24C3), 27.-30. Dec 2007, Berlin (Germany): *Quantum Cryptography and possible attacks*, plenary talk
13. 6th International conference on cryptology and network security (CANS), 8.-10. Dec 2007, Singapore: *Aspects of Practical Quantum Key Distribution Schemes*, inv. talk
14. Workshop on Theory and Realisation of Practical Quantum Key Distribution (TROPICAL QKD), 11.-14. June 2007, Waterloo (Canada): *Spying on a quantum key distribution system through a timing side channel*, poster

15. Workshop on Theory and Realisation of Practical Quantum Key Distribution (TROPICAL QKD), 11.-14. June 2007, Waterloo (Canada): *Free-space QKD with polarization-entangled photon pairs*, inv. talk

16. DAMOP 2007 meeting, 5.-9. June 2007, Calgary (Canada): *Free-space QKD using polarization-entangled photon pairs*, inv. talk

17. Eighth international conference on quantum communication, measurement and computation (QCMC2006) 28. Nov-3. Dec 2006, Tsukuba, Japan: *Joint spectrum mapping of polarization entanglement in parametric down conversion*, poster.

18. Eighth international conference on quantum communication, measurement and computation (QCMC2006) 28. Nov-3. Dec 2006, Tsukuba, Japan: *Free-space quantum key distribution using polarization entangled photons*, contrib. talk

19. Defence Technology Prize Exhibition '06, November 2006: *Life demonstration of an entangled-photon based QKD system in daylight conditions* (experimental exhibit)

20. ARDA-NIST Workshop Toward the Production of a Fast, Robust Source of Entangled Photons on Demand, October 7-8, 2004: *beacon-mode/beam-like twin photons*, inv. talk

21. Conference on Quantum Information and Quantum Control „*Tools for experimental quantum cryptography*“,July 19-23, 2004, Toronto, Canada, inv. talk

22. 2nd Asia-PAcific Workshop on Quantum Informtion Science, December 15-19, 2003: *Experimental Quantum Cryptography*, inv talk

23. Chaos Communication Congress (19C3) Berlin, December 27-30, 2003: *Quantenkryptographie*, inv. Talk

24. European Research Conference „Quantum Atom Optics“ San Feliu, Spain, September 21-26, 2002: *Long Distance Quantum Cryptography*, inv. talk

25. DPG-Tagung Osnabrück (2002): *Freiraum-Quantenkryptographie*, inv. talk

26. Second European Comission QIPC workshop, 28.-31.October 2001, Torino, Italy: *Free space quantum cryptography*,inv. talk

27. The Second ESF Quantum Information Technologies Conference, Gdansk, Poland, July 10-18, 2001: *Violation of a Bell's inequality with an entangled 4-photon state*, inv. talk

28. Coherence and Quantum Optics Conference CQOC8, Rochester, NY (USA), June 13-15, 2001: *Experimental Four Photon Entanglemen*t, poster; *Efficient collection of polarization-entangled photons on type-II parametric down conversion*, contrib. talk

29. International Conference on quantum Information IQCI, Rochester, NY (USA), June 2001:T*ools for practical quantum cryptography*, poster

30. QUICK conference on Quantum interference and kryptographic keys, Cargese, Corsica/France, April 7-13, 2001: *Tools for practical Quantum Cryptography,* invited talk

31. IQEC/CLEO-Europe, 12 - 14 September 2000, Nice (France): *A Robust All-Solid Source for Single Photons*, contrib. talk

32. DPG-Tagung Bonn (2000): *Kompakte Quelle für einzelne Photonen*, contrib. talk

33. Current trends in Nano-optics, May 14-18, 2000 Physikzentrum, Bad Honnef, Germany: *A robust all-solid-state source for single photon*, poster

34. MYSTERIES, PUZZLES AND PARADOXES IN QUANTUM MECHANICS Workshop on ENTANGLEMENT AND DECOHERENCE, Gargnano (Italy), 20-25 September 1999: *Towards a quantum computing experiment with Ba-137 ions, poster; Playing around with type-II parametric down conversion*, poster

35. First Annual Workshop of the SquInT network, Albuquerque (USA), March 30 - May 2, 1999: *Towards a quantum computing experiment with 137Ba ions*, poster

36. IQEC '98, San Francisco (USA): *"Recent experimental results in using ^{137}Ba in a miniaturized ion trap for quantum computation"*, poster

37. Spring Meeting of the German Physical Society, Mainz, March 3.-6., 1997: *"Vermessung der Wigner-Funktion in einem Doppelspalt-Atominterferometer*", contrib. talk.

38. EQEC '96, Hamburg (Germany): *"Measurement of the Wigner Function of a Matter Wave Packet"*, contrib. talk (1996); *"Coherent Excitation of a He* Beam Observed in Atomic Momentum Distributions"*, contrib. talk (1996)

39. IQEC '96, Sidney (Australia): *"Correlation measurements between atoms and photons on the single particle level"*, inv. talk (1996); *"Excitation of a metastable He beam by adiabatic transfer"*, poster
40. Workshop on atom interferometry, Cairns (Australia): *"Excitation of a metastable He beam by adiabatic transfer"*, poster; *"Measurement of the Wigner function of a matter wave packet"*, poster (1996)
41. DPG-Tagung Jena (Germany): *"Atom-photon correlations on a single particle level"*, contr. talk*; "Excitation of a metastable He beam by adiabatic transfer"*, poster
42. Conference on Quantum interference, Trieste (Italy): *"A Heisenberg microscope for He* atoms"*, inv. talk (1995)
43. DPG-Tagung Innsbruck (Austria): *"A Heisenberg microscope for atoms"*, inv. talk (1995)
44. CLEO/EQEC '94, Amsterdam (Netherlands): *"A detector for metastable rare gas atoms with high spatial and temporal resolution"*, poster, (1994)
45. New York Academy of Science: Fundamental Problems in Quantum Theory, Baltimore: *"A Heisenberg microscope for Helium Atoms"*, inv. talk (1994)
46. European Quantum Electronics Conference EQEC '93, Firenze (Italy): *"Experimental demonstration of a magneto-optical beamsplitter"*, (1993)
47. OSA-Meeting Toronto: *"A magneto-optical beamsplitter for atoms"*, inv. talk (1994)
48. DPG-Tagung Berlin (Germany): *"Experimental realization of a magneto-optical beamsplitter"*, contrib. talk (1993)
49. European Research Conference on Quantum Optics, Davos (Switzerland): *"Magneto-optical beamsplitter"*, poster (1993)

Seminars / Lectures

1. Lecture block at the Les Houches Singapore summer school, July 2009 (together with A. Lamas-Linares): *Quantum optics devices*
2. Sonderkolloquium Physik-Department der Universität Freiburg, 26. June 2009, Freiburg i.Br., Germany: *Substantial scattering of photons by a single atom*
3. Lecture at the Asher Peres summer school: From Qubits to Black Holes, Chowder bay, Sydney, 17.-22. November 2008: *A taste of experimental quantum information techniques,*and: *Aspects of Quantum Cryptography*
4. Lecture in QKD summer school: Information security in a Quantum World, Waterloo, Canada, 7.-11.August 2008: *Some aspects of practical QKD systems*
5. Seminar in the Atomic and Optical Physics Group of NIST, Gaithersburg, 3.06.2008*: Quantum crypto: E91, attacks*
6. Defence Research & Development Seminar 2006, NTU Singapore, 23.05.2006: *Free-Space Quantum Secret Key distribution using polarization-entangled photons*
7. Seminar in the Atomic and Optical Physics Group of NIST, Gaithersburg, 23.01.2004*: A free space longdistance QKD experiment*
8. Seminar in the statistical physics group, 22.01.2003, Universität Regensburg: *Experimentelle Freiraum-Quantenkryptographie*
9. Education for Physics teachers: Quantenmechanik: „Erfolgreiche experimentlle Bestätigungen und paradoxe Interpretation“, Universität Bayreuth, 10. Oktober 2002: *Quantenkryptographie und experimentelle Quantenkommunikation*
10. Education for Physics teachers „Neues von Quanten“ am Physikzentrum Bad Honnef, 26.-30. August 2002: *Neue Experimente zu Quantenkryptographie*
11. Faculty colloquium Sektion Physik an der Ludwig-Maximilians-Universität München, 17. Juli 2002: *Experimentelle Quantenkommunikation*
12. Quantenforum am Institut für Physik der Universität Stuttgart, 16.05.2002*: Quantenkommunikation mit wenigen Photonen*

13. Quantum optics school for advanced students, April 2-12, Bonn (Germany): *Quantum communication*
14. BSI NOSTACK workshop, 21.-23. January 2002, Weyberhöfe (Germany) : *Free space quantum cryptography*
15. KOLLOQUIUM Quanten-Kommunikation, 10.-11.7.2000, Universität Erlangen-Nürnberg: *Quantenkommunikation mit einzelnen Photonen und Photonenpaaren*
16. Kolloquium of the SFB 'Control and measurement of coherent Quantum Systems', 17.3.2000, University of Innsbruck: *All solid-state single photon source.*
17. Los Alamos sessions of the Quantum technology seminar, May 25, 1999, Los Alamos: *Towards quantum computation in an ion trap - First experimental Raman cooling results with Ba-137*
18. Seminar des Optik-Zentrum Konstanz, 5.12.1996, Universität Konstanz: *Experimente mit korrelierten Atom-Photon-Paaren*

Bibliometry

Details under ResearcherID C-2849-2009. Numerics as of December 2009 according to ISI web of science:

- over 2400 citations, including about 20% self-citations
- over 30 citations per listed item
- h-index: 23

Awards / Honors

- NUS Faculty of Science Teaching Award (Nov 2009)
- Named Dean's Chair in the Faculty of Science of NUS (July 2009)
- National Science Award Singapore 2008 (together with A. Lamas-Linares and V. Scarani) for „outstanding theoretical and experimental studies on quantum entanglement" (specifically the violation of the Legget model on nonlocal hidden variables)
- NUS Faculty of Science research award 2007
- Elected Fellow of the American Physical Society (2007)
- Phillip Morris Research Award 2003 (together with Harald Weinfurter) for the development of compact modules for quantum cryptography

Outreach

- Singapore Amazing Machine Competition @Singapore Science Centre: Juror (22. August 2009)
- DEFCON17, 31.July-2.August 2009: Demonstration of a Bell inequality violation and the hacking of a QKD system (experimental exhibition)
- Exhibition at the Singapore Science Centre (15.-31.March 2009)
- Offer and judging of special research projects for secondary school students (SRP)
- National Junior Robotics competition 2006: Juror (Sept. 2006)
- Physics Enrichment Camp 2006: Quantum computing or quantum information or How a funky theory may affect how we calculate things in the future (May 29-June 1, 2006, Nat. Univ. Singapore)
- Physics Enrichment Camp 2005: Quantum computing or quantum information: Concepts, hopes, and promises - and what we can do at the moment (May 30-June 2, 2005, Nat. Univ. Singapore)
- Exhibition of an entangled photon pair source for quantum cryptography in the framework of the Infocomm Technology Foresight symposium organized by IDA (March 8, 2005, Raffles City Hotel, Singapore)
- IDA symposium on Quantum Cryptography: Seminar to Industrial and academic representatives :*Quantum cryptography: Status and Updates*, (22. September 2004, National University of Singapore)
- Exhibition of an experiment on Interference and the Speed of light in the context of the X-periment '04 exhibition in Suntec City Mall (3.-5. September 2004)