



Curriculum vitae Christian Kurtsiefer

born August 20, 1967 in Munich, Germany

- Sept 87-Oct 91** Diploma program in Physics at the University of Konstanz
- Sept 90-Mar 91** Studies at the Université J. Fourier in Grenoble, France in a student exchange scheme (ERASMUS)
- Dec 91-Dec 92** Diploma thesis in experimental atom optics in Konstanz
- Jan 93-July 97** Doctoral thesis in the group of Prof. J. Mlynek on matter wave interference, correlated atom-photon pairs, quantum state tomography
- July 97-July 99** Postdoc at the IBM Almaden Research Center in San Jose, CA on an experimental quantum computation project with single ions
- July 99 -Oct 03** Scientific staff member in the group of Prof. H. Weinfurter at the University of Munich, with focus on optical quantum communication and single photon effects
- since Oct 03** Faculty member of the Physics Department of the National University of Singapore; establishing of an experimental lab in quantum information technology with emphasis on entangled photon sources, their application to quantum key distribution and optimal quantum measurement strategies, and single-photon interaction with single trapped atoms
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Articles in peer-reviewed journals

1. Y.-S. Chin, M. Steiner, C. Kurtsiefer: *Polarization gradient cooling of single atoms in optical dipole traps*, [Phys. Rev. A **96**, 033406 \(2017\)](#).
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3. H.S. Poh, A. Cerè, J.-D. Bancal, Y. Cai, N. Sangouard, V. Scarani, C. Kurtsiefer: *Experimental many-pairs nonlocality*, [Phys. Rev. A **96**, 022101 \(2017\)](#).
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5. Y.S. Chin, M. Steiner, C. Kurtsiefer: *Quantifying the role of thermal motion in free-space light-atom interaction*, [Phys. Rev. A **95**, 043809 \(2017\)](#).
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10. P.K. Tan, A.H. Chan, C. Kurtsiefer: *Optical Intensity Interferometry through Atmospheric Turbulence*, [Monthly Notices of the Royal Astronomical Society \(MNRAS\) **457**, 4291-4295 \(2016\)](#).
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15. V. Scarani and C. Kurtsiefer: *The black paper of quantum cryptography: real implementation problems*, [Theoretical Computer Science **560**, 27-32 \(2014\)](#).
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Patents

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2. Y. Shih, B. Chng, C. Kurtsiefer: *Method and System for Random Number Generation*, filed 27 March 2017, International Patent Application No. PCT/SG2017/050096
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14. 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)
15. 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).
16. 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).
17. 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).
18. 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).

19. 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).
20. 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).
21. 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. SPIE Optics + Photonics 2017, 6-10 August 2017, San Diego, USA, *Preparation of single photon states with rising exponential shape*, invited talk.
2. 15th Asian Quantum Information Science conference, 24-30 August 2015, KIAS, Seoul, South Korea, *Experimental Techniques for Strong Interaction between Photons and Atoms*, invited talk.
3. 15th Asian Quantum Information Science conference (Satellite workshop), 24-30 August 2015, KIAS, Seoul, South Korea, *Bell tests with Entangled Photons - what is left?* invited talk.
4. CLEO/Europe -EQEC 2015, 21-25 June 2015, Munich, Germany, *Reversing the Temporal Envelope of a Heralded Single Photon using a Cavity*, talk EA.6.2
5. CLEO/Europe -EQEC 2015, 21-25 June 2015, Munich, Germany, *co-author of another talk and two posters*
6. Congressi Stefano Franscini / NCCR "Quantum Systems and Technology", 7-12 June 2015, Monte Verità 2015, Ascona, Switzerland, *Temporal shaping of narrow-band optical photons for interaction with atoms*, . Invited talk
7. Conference on Resonator QED (CCQED), 9-13 Sept 2013, Munich, Germany, *Atom-light interaction with strongly focused fields*, Germany, invited talk.
8. Conference on Lasers an Electro-Optics 2013 , 9-14 June 2013, San Jose, CA, *coauthor of two talks by members of my research group*.
9. Asia Pacific workshop on Quantum Information Science APWQIS2013, 21-23 May 2013, Tokyo, Japan, *Correlated and entangled narrowband photons for interaction with atomic systems*, invited talk
10. CLEO/Europe-IQEC Conference 2013, 12-16 May 2013, Munich, Germany, *coauthor of two talks by members of my research group*.
11. Coherent Control of Complex Quantum Systems, 14-17 April 2013, Okinawa, Japan, *Coupling single Photons to single Atoms*, invited talk.
12. IPS meeting 2013, 4-6 March 2013, NTU Singapore, *Chairman and orgainzer, several contributions as co-author*
13. *DAMOP 2012*, Anaheim, US, June 2012; *oauthor of two contributions by members of my research group*.
14. DPG Tagung 2012, 12.-16. Mar 2012, Stuttgart, Germany, *Efficient narrowband PPKTP source for Polarization-entangled photons, 3 other contibutions as co-author*
15. IPS meeting 2012, 23.-24. Feb 2012, NUS Singapore, *Chairman and main orgainzer, several contributions as co-author*
16. CLEO/Europe-EQEC 2011, 22.-26. May 2011, Munich, Germany, *three contributions as co-author*
17. Conference on Lasers and Electro-optics (CLEO2011), 1.-6. May 2011, Baltimore, MD, *Full Eavesdropping on a practical QKD system*, invited talk
18. DPG Tagung 2011, 11.-13. March 2011, Dresden, Germany, *four contributions as co-author*
19. Institute of Physics Singapore annual research meeting 2010, NUSH Singapore, *Chairman, several contributions as co-author*
20. Workshop on Quantum Information Processing (QIP2011), 10.-14. January 2011, Sentosa, Singapore, *Implementation of an attack scheme on a practical QKD system*, invited talk
21. Workshop on Cryptography from Storage Imperfections, 19.-23. March 2010, IQI Caltech, Pasadena, CA, *Implementation of an attack scheme on a practical QKD system*, invited talk

22. DPG Tagung 2010, 8.-13. Mar 2010, Hannover, Germany, *Implementation of an attack scheme on a practical QKD system*
23. 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
24. SPW09 - Single photon workshop 2009, 3.-6. Nov 2009, NIST Boulder, CO: *Substantial scattering of photons by a Single Atom*, invited talk
25. EQEC09-CLEO/Europe, 14.-19. June 2009, Munich, Germany, *Substantial scattering of a Weak Coherent Beam by a Single Atom*, invited talk
26. SPIE Photonics West, 24.-29. January 2009, San Jose, CA: *Interfacing light and single atoms with a lens*, keynote presentation
27. UQC2008, 1.-2. December 2008, Akihabara Tokyo: *Status of R&D on Quantum communication and related R&D in Singapore*, invited talk
28. DEFCON 16, 8.-10. August 2008, Las Vegas: The Quantum Lounge (experimental exhibition of an entanglement-based QKD system)
29. Black Hat 2008, 2.-7. August 2008, Las Vegas: The Quantum Spookshow (experimental exhibition of an entanglement-based QKD system)
30. 17th International Laser Physics Workshop (LPHYS08), 30. June- 4. July 2008, Trondheim, Norway: *What can one do with single photons?* plenary talk
31. DAMOP2008 meeting, 27.-31. May 2008, Penn State (USA): *Strong Interaction Between Light and a Single Trapped Atom Without a Cavity*, co-authored talk
32. 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
33. 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
34. 24th Chaos Communication Congress (24C3), 27.-30. Dec 2007, Berlin (Germany): *Quantum Cryptography and possible attacks*, plenary talk
35. 6th International conference on cryptology and network security (CANS), 8.-10. Dec 2007, Singapore: *Aspects of Practical Quantum Key Distribution Schemes*, inv. talk
36. 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
37. 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
38. DAMOP 2007 meeting, 5.-9. June 2007, Calgary (Canada): *Free-space QKD using polarization-entangled photon pairs*, inv. talk
39. 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.
40. 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
41. Defence Technology Prize Exhibition '06, November 2006: *Life demonstration of an entangled-photon based QKD system in daylight conditions* (experimental exhibit)
42. 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
43. Conference on Quantum Information and Quantum Control „Tools for experimental quantum cryptography“, July 19-23, 2004, Toronto, Canada, inv. talk
44. 2nd Asia-PACIFIC Workshop on Quantum Information Science, December 15-19, 2003: *Experimental Quantum Cryptography*, inv talk
45. Chaos Communication Congress (19C3) Berlin, December 27-30, 2003: *Quantenkryptographie*, inv. Talk
46. European Research Conference „Quantum Atom Optics“ San Feliu, Spain, September 21-26, 2002: *Long Distance Quantum Cryptography*, inv. talk

47. DPG-Tagung Osnabrück (2002): *Freiraum-Quantenkryptographie*, inv. talk
48. Second European Commission QIPC workshop, 28.-31.October 2001, Torino, Italy: *Free space quantum cryptography*, inv. talk
49. 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
50. Coherence and Quantum Optics Conference CQOC8, Rochester, NY (USA), June 13-15, 2001: *Experimental Four Photon Entanglement*, poster; *Efficient collection of polarization-entangled photons on type-II parametric down conversion*, contrib. talk
51. International Conference on quantum Information IQCI, Rochester, NY (USA), June 2001: *Tools for practical quantum cryptography*, poster
52. QUICK conference on Quantum interference and cryptographic keys, Cargese, Corsica/France, April 7-13, 2001: *Tools for practical Quantum Cryptography*, invited talk
53. IQEC/CLEO-Europe, 12 - 14 September 2000, Nice (France): *A Robust All-Solid Source for Single Photons*, contrib. talk
54. DPG-Tagung Bonn (2000): *Kompakte Quelle für einzelne Photonen*, contrib. talk
55. Current trends in Nano-optics, May 14-18, 2000 Physikzentrum, Bad Honnef, Germany: *A robust all-solid-state source for single photon*, poster
56. 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
57. First Annual Workshop of the SquInT network, Albuquerque (USA), March 30 - May 2, 1999: *Towards a quantum computing experiment with ^{137}Ba ions*, poster
58. IQEC '98, San Francisco (USA): *"Recent experimental results in using ^{137}Ba in a miniaturized ion trap for quantum computation"*, poster
59. Spring Meeting of the German Physical Society, Mainz, March 3.-6., 1997: *"Vermessung der Wigner-Funktion in einem Doppelspalt-Atominterferometer"*, contrib. talk.
60. 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)
61. 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
62. 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)
63. DPG-Tagung Jena (Germany): *"Atom-photon correlations on a single particle level"*, contr. talk; *"Excitation of a metastable He beam by adiabatic transfer"*, poster
64. Conference on Quantum interference, Trieste (Italy): *"A Heisenberg microscope for He* atoms"*, inv. talk (1995)
65. DPG-Tagung Innsbruck (Austria): *"A Heisenberg microscope for atoms"*, inv. talk (1995)
66. CLEO/EQEC '94, Amsterdam (Netherlands): *"A detector for metastable rare gas atoms with high spatial and temporal resolution"*, poster, (1994)
67. New York Academy of Science: Fundamental Problems in Quantum Theory, Baltimore: *"A Heisenberg microscope for Helium Atoms"*, inv. talk (1994)
68. European Quantum Electronics Conference EQEC '93, Firenze (Italy): *"Experimental demonstration of a magneto-optical beamsplitter"*, (1993)
69. OSA-Meeting Toronto: *"A magneto-optical beamsplitter for atoms"*, inv. talk (1994)
70. DPG-Tagung Berlin (Germany): *"Experimental realization of a magneto-optical beamsplitter"*, contrib. talk (1993)
71. European Research Conference on Quantum Optics, Davos (Switzerland): *"Magneto-optical beamsplitter"*,

poster (1993)

Seminars / Lectures

1. Training on Quantum Technologies, Infineon Singapore, 16 May 2017: *Quantum Random Number Generators and Their Implementation*
2. Quantum Engineering Science and Technologies Symposium (QuESTS), 14-18 November 2016, Singapore: *Engineering atom-light interaction with strongly focused optical modes*
3. Quantum Interface Fest at ICFO, Casteldefels, Spain, 28. June 2012: *Single atom-photon interfaces with strongly focused optical modes*
4. Lecture Block on at IAS Summer school of Physics, 28/29. May 2012, NTU Singapore: *Atom-Light interaction in the strong focusing regime*
5. Seminar at NIST Boulder, 10. May 2011: *Interaction of photons in strongly focused modes with single atoms*
6. Seminar at LMU Munich, Germany; 15. March 2010: *Substantial scattering of photons by a Single Atom*
7. Sonderkolloquium Experimentelle Quantenoptik, 1.-2. March 2010, Universität Ulm, Germany: *Strongly focused optical fields - an alternative to cavity quantum electrodynamics?*
8. Workshop on Atom-Photon Interaction, 14. January 2010, ICFO Castelldefels, Spain: *Substantial scattering of Photons by a Single Atom in the Strong Focusing Regime*
9. Lecture block at the Les Houches Singapore summer school, July 2009 (together with A. Lamas-Linares): *Quantum optics devices*
10. Sonderkolloquium Physik-Department der Universität Freiburg, 26. June 2009, Freiburg i.Br., Germany: *Substantial scattering of photons by a single atom*
11. 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*
12. Lecture in QKD summer school: Information security in a Quantum World, Waterloo, Canada, 7.-11. August 2008: *Some aspects of practical QKD systems*
13. Seminar in the Atomic and Optical Physics Group of NIST, Gaithersburg, 3.06.2008: *Quantum crypto: E91, attacks*
14. Defence Research & Development Seminar 2006, NTU Singapore, 23.05.2006: *Free-Space Quantum Secret Key distribution using polarization-entangled photons*
15. Seminar in the Atomic and Optical Physics Group of NIST, Gaithersburg, 23.01.2004: *A free space longdistance QKD experiment*
16. Seminar in the statistical physics group, 22.01.2003, Universität Regensburg: *Experimentelle Freiraum-Quantenkryptographie*
17. Education for Physics teachers: Quantenmechanik: „Erfolgreiche experimentelle Bestätigungen und paradoxe Interpretation“, Universität Bayreuth, 10. Oktober 2002: *Quantenkryptographie und experimentelle Quantenkommunikation*
18. Education for Physics teachers „Neues von Quanten“ am Physikzentrum Bad Honnef, 26.-30. August 2002: *Neue Experimente zu Quantenkryptographie*
19. Faculty colloquium Sektion Physik an der Ludwig-Maximilians-Universität München, 17. Juli 2002: *Experimentelle Quantenkommunikation*
20. Quantenforum am Institut für Physik der Universität Stuttgart, 16.05.2002: *Quantenkommunikation mit wenigen Photonen*
21. Quantum optics school for advanced students, April 2-12, Bonn (Germany): *Quantum communication*
22. BSI NOSTACK workshop, 21.-23. January 2002, Weyberhöfe (Germany) : *Free space quantum cryptography*
23. KOLLOQUIUM Quanten-Kommunikation, 10.-11.7.2000, Universität Erlangen-Nürnberg: *Quantenkommunikation mit einzelnen Photonen und Photonenpaaren*

24. Kolloquium of the SFB 'Control and measurement of coherent Quantum Systems', 17.3.2000, University of Innsbruck: *All solid-state single photon source*.
25. 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*
26. 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 September 2017 according to ISI web of science:

- 5682 citations, including about 4% self-citations
- over 46 citations per listed item
- h-index: 38
- other researcher identifier: [ORCID 0000-0003-2190-0684](#)

Awards / Honors

- IPS World Scientific Medal (February 2013)
- Elected IPS fellow (May 2010)
- 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“
- 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

- NUS Physics Society – Spark the gap: How did physicists detect Gravitational Waves? Some tools that revealed the GW150914 event (17 Jan 2017)
- Physics enrichment camp: Lecture on the LIGO Gravitational Wave detector, NUS Physics Department, (31 May – 3 June 2016)
- Quantum Dot dot dot event at ArtScience museum, Singapore, with experiments on single NV centers, fluorescence spectroscopy and the physics of light sources (Dec 2015)
- Exhibition at Singapore X-pariment! 2015 with experiments on single NV center magnetometry (July 2015)
- Exhibition at Singapore Mini Maker Faire 2014 and X-pariment! 2014 with experiments on optical spectroscopy of ambient light (July 2014)
- Enrichment session at Anson Junior College and Tampines JC (May 2014)
- Exhibition at Singapore Mini Maker Faire 2013 with experiments on optical diffraction and entangled photons
- Exhibition of an experiment on Bell inequality violation with photon pairs with X-pariment! 2010 exhibition in Marina Square Shopping Mall (30. Jul-1. Aug 2010)
- 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)

Teaching

National University of Singapore

- Lecture for 2nd year undergraduate module PC2132 (Classical Mechanics)
- Special Programme in Science module supervisor (SPS2172) on sonoluminescence
- Graduate module coordinator for QT5201I (BREAKTHROUGH TECHNIQUES IN ATOMIC AND MANY-BODY PHYSICS)
- Special Programme in Science module supervisor (SPS2172) on stellar interferometry
- Graduate module supervisor for QT5201B (formalized assessment for Les Houches summer school attendees)
- Graduate module design and lecture/labs on basic experimental techniques (PC5214)
- Supervision of a independent studies module on Bose-Einstein Condensation
- Formulation and Supervision of various (6) undergraduate research projects (UROPS)
- Lecture and Tutorials for honours year module PC4243 (Atomic and Molecular Physics II)
- Lecture and Tutorials for honours year module PC4246 (Quantum Optics)
- Supervision of honors, masters and graduate students in experimental quantum optics
- Supervisor in 3rd year lab

Universität München

- Student seminar on quantum computation
- Supervision of diploma- and PhD students together with H. Weinfurter: lecture „Experimentelle Quantenoptik“
- Student seminar on quantum information and -communication
- Tutorials in classical electrodynamics, exam preparation & correction
- Tutorials in quantum mechanics, exam preparation & correction
- Tutorials in theoretical mechanics, exam preparation & correction
- Tutorials in experimental physics: optics, atom- and molecular physics
- Design, setup and supervision of an advanced optics lab experiment on Gaussian optics
- Beginners lab course for science students

Universität Konstanz

- Supervision of diploma students
- Tutorials in theoretical electrodynamics
- Tutorials in classical optics (for final exam topics)
- Tutorials in atom and molecular physics
- Beginners lab course tutorial for science students

Research Grants

National University of Singapore

- Quantum Key Distribution via fiber (NUS-Singtel CorpLab on Cybersecurity, S\$3.4M TPV; role: Co-PI)
- Hybrid Quantum Technologies (NRF Competitive Research Programme round 12, PI, granted: S\$4.3M TPV, with 3 Co-PI)
- DSO grant on magnetometry (about S\$280k, PI)
- Randomness from quantum processes (MoE Tier-3 grant, Co-PI, granted about S\$9.8M)
- Partner in the EU 7th framework proposal cluster AQUTE with a project on cavityless atom-photon coupling
- Principal investigator at CQT with several projects on quantum information, focused in quantum optics and elementary atom-light interaction and quantum interfaces (core funding of about S\$1.3M/yr for the quantum optics group as PI, or Co-PI together with Asst/P Antia Lamas-Linares)
- Initiating member of the Centre for Quantum Technologies, an RCE in Singapore, funded by the National Research Foundation and the Ministry of Education in Singapore (total grant sum S\$158M over 5-10 years)
- Multiphoton state preparation and characterization (NUS ARF, granted: S\$106,600; role: Co-PI)
- Light sources for Quantum Interfaces (NUS ARF, granted: S\$86,000, role: PI)
- Reference-Free quantum communication (ASTAR/SERC, granted: S\$769,000, role: PI)
- Characterization of Quantum Dots for Quantum Information Processing (NUS ARF, granted: S\$178,000, role: PI)
- Quantum Key Distribution Research (Defence Science and Technology Agency, granted: S\$399,000, role: PI)
- Experimental quantum communication (Nat. Univ. Singapore Acad. Research Fund, granted: S\$176,000, role: PI)

Universität München

- SFB 631 (Festkörperbasierte Quanteninformationsverarbeitung: Physikalische Konzepte und Materialaspekte / Solid State Based Quantum Information Processing: Physical Concepts and Materials Aspects): *Einzelphotonenquellen für Quantenkommunikation und Quantencomputer* (role: Co-PI)
- Landesschwerpunkt (A8 - Quanteninformation): Mehrteilchen- und Mehrzustands-Quantenkryptographie (role: Co-PI)

Academic service

National University of Singapore

- Panel member in Technology scan group "Nanotechnology" for the Singapore Infocom Development Agency (IDA) roadmap
- Member in the Physics Department Strategic Planning Committee
- Undergraduate / graduate curriculum committee member at NUS
- Member in outreach committee / workshop committee in the NUS Physics Department
- Member of curriculum committee at NUS Physics Dept
- Member of various search committees for faculty hiring in the NUS Physics Department
- Chair of the welfare committee at NUS Physics Dept
- Research representative for building infrastructure of the Research Center of Excellence in Quantum Technologies and chair of space allocation committee
- Member of standing search committee for faculty recruitment at the Centre for Quantum Technologies
- Member of graduate studies committee in the Department of Physics at NUS
- Member of the graduate studies committee at the Centre for Quantum Technologies
- Chair of experimental infrastructure committee at the Centre for Quantum Technologies
- Member of the Faculty Promotion and Tenure committee (senior) at the Science Faculty, NUS
- Chairman Workshop committee of the Physics Department, NUS

Universität Konstanz

- Mittelbauvertreter im Fakultätsrat

Other academic activities

- Coordinating editor of Quantum journal I (2016-)
- Deputy President (2016-) of the Institute of Physics Singapore (IPS)
- International advisory board member for Journal of Physics B: Atomic, Molecular and Optical Physics
- Council member (ongoing) and treasurer (2007-2008) of the Institute of Physics Singapore
- Initiator and chairman of the annual meetings of the Institute of Physics in Singapore (IPS)
- External thesis examiner for graduate students (Germany, Australia, S Africa, Spain)
- Grant proposal review for national, regional and university research funds in Canada, US and Europe
- Grant proposal reviewer for research networks supported by VDI/BMBF (Association of German engineers/Ministry for technology and research), Germany
- Review for Marie Curie and ERC grants of the European Union
- Peer reviewer for various Journals (Nature, Nature Physics, Nature Photonics, Phys. Rev. Lett, PRA, Opt. Comm., NJP, APL, Appl. Phys. B, several physics journals published by World Scientific, JMO, Optics Express)