

Publication list

Daniel Ljunggren

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Titles are hyperlinked in electronic format.

Research interests

Photonic quantum information technologies and quantum optics. Experimental work on quantum light sources by light-matter interactions in exotic nonlinear optical media, entangled photon-pair correlations and statistics, sources of single-photons by single atoms via cavity quantum electrodynamics, and quantum memories by electromagnetically induced transparency.

Peer-reviewed articles

1. P. Nisbet-Jones, J. Dille, **D. Ljunggren**, A. Kuhn, [Highly efficient source for indistinguishable single photons of controlled shape](#), New J. of Phys. **13**, 103036 (2011).
2. G. Vasilev, **D. Ljunggren**, A. Kuhn, [Single photons made-to-measure](#), New J. of Phys. **12**, 063024 (2010).
3. A. Kuhn, **D. Ljunggren**, [Cavity-based single-photon sources](#), invited review article, Contemporary Physics, **51**, 289-313 (2010).
4. S. Sauge, M. Swillo, S. Albert-Seifried, G. B. Xavier, J. Waldebäck, M. Tengner, **D. Ljunggren**, A. Karlsson, [Narrowband polarization-entangled photon pairs distributed over a WDM link for qubit networks](#), Opt. Express **15**, 6926-6933 (2007).
5. **D. Ljunggren**, M. Tengner, P. Marsden, and M. Pelton, [Theory and experiment of entanglement in a quasi-phase-matched two-crystal source](#), Phys. Rev. A **73**, 032326 (2006).
6. **D. Ljunggren** and M. Tengner, [Optimal focusing for maximal collection of entangled narrow-band photon pairs into single-mode fibers](#), Phys. Rev. A **72**, 062301 (2005).
7. M. Pelton, P. Marsden, **D. Ljunggren**, M. Tengner, A. Karlsson, A. Fragemann, C. Canalias, F. Laurell, [Bright, single-spatial-mode source of frequency non-degenerate, polarization-entangled photon pairs using periodically poled KTP](#), Opt. Express **12**, 3573 (2004).
8. **D. Ljunggren**, M. Bourennane and A. Karlsson, [Authority-based user authentication in quantum key distribution](#), Phys. Rev. A **62**, 022305 (2000).
9. M. Bourennane, **D. Ljunggren**, A. Karlsson, P. Jonsson, A. Hening and J. Peña Císcar, [Experimental long wavelength quantum cryptography: from single-photon transmission to key extraction protocols](#), J. Mod. Opt. **47**, 563-579 (2000).
10. M. Bourennane, F. Gibson, A. Karlsson, A. Hening, P. Jonsson, T. Tsegaye, **D. Ljunggren** and E. Sundberg, [Experiments on long wavelength \(1550 nm\) "plug and play" quantum cryptography systems](#), Opt. Express **4**, 383-387 (1999).

Articles in preparation or archived online

11. **D. Ljunggren**, M. Tengner, [On the photon statistics of heralded single-photon sources](#), manuscript.
12. M. Tengner and **D. Ljunggren**, [Characterization of an asynchronous source of heralded single photons generated at a wavelength of 1550 nm](#), arXiv:0706.2985v1 [quant-ph] (2007).

Peer-reviewed conference contributions (proceedings papers^(†), talks^(*), posters)

13. G. Langfahl-Klabes, P. Nisbet, J. Dille, G. Vasilev, **D. Ljunggren** and A. Kuhn, *EIT storage for arbitrarily shaped low-intensity light pulses*, (Q 55.53) DPG Meeting of the Section AMOP, Hannover, Germany (2010).
14. P. Nisbet, J. Dille, G. Langfahl-Klabes, G. Vasilev, **D. Ljunggren** and A. Kuhn, *Atom-Photon-Interfaces - Single-Photon Generation and Shaping*, (Q 21.53) DPG Meeting of the Section AMOP, Hannover, Germany (2010).
15. P. Nisbet, J. Dille, G. Langfahl, G. Vasilev, **D. Ljunggren** and A. Kuhn, *Implementations of Atom-Photon Interfaces for Quantum Networking*, European Conference on Lasers and Electro-Optics and the XIth European Quantum Electronics Conference (CLEOE-EQEC), Munich, Germany (2009).
16. J. Dille, **D. Ljunggren**, P. Nisbet, G. Langfahl, G. Vasilev and A. Kuhn, *Developing atom-photon interfaces for single-photon generation and storage*, International Conference on "Scalable Quantum Computing with Light and Atoms" (SCALA), Cortina d'Ampezzo, Italy (2009).
17. **D. Ljunggren**, J. Dille, G. Langfahl, P. Nisbet, and A. Kuhn, *From single-photons to quantum memory via photon-atom interface*, Conference on Quantum Information Processing Interdisciplinary Research Collaboration (QIPIRC), Oxford (2008).
18. **D. Ljunggren**, E. Brainis, L. Brandt, C. Muldoon, J. Dille, G. Langfahl, P. Nisbet, and A. Kuhn, *Towards scalable quantum networks, memories, and interfaces*, 3rd annual meeting of "Scalable Quantum Computing with Light and Atoms" (SCALA), Mainz, Germany (2008).
- †*19. S. Sauge, M. Swillo, S. Albert-Seifried, G.B. Xavier, J. Waldebäck, M. Tengner, **D. Ljunggren**, Q. Wang, and A. Karlsson, *Quantum Communication in Optical Networks: an Overview and Selected Recent Results*, (talk) Proceedings of the 9th International Conference on Transparent Optical Networks (ICTON), **1**, 33, Rome, Italy (2007).
- *20. S. Sauge, M. Swillo, S. Albert-Seifried, J. Waldebäck, M. Tengner, **D. Ljunggren**, A. Karlsson, and G. B. Xavier, *Narrowband polarization-entangled photon pairs distributed over a WDM link for qubit networks*, (talk) European Conference on Lasers and Electro-Optics and the International Quantum Electronics Conference (CLEOE-IQEC), Munich, Germany (2007).
- †*21. M. Tengner, **D. Ljunggren**, S. Sauge, J. Waldebäck, and A. Karlsson, *Single-photon correlations for secure communication*, Conference on Advanced Free-Space Optical Communication Techniques and Applications II, eds. L. J. Sjöqvist *et al.* Proc. SPIE **6399**, U124, Stockholm, Sweden (2006).
22. M. Tengner and **D. Ljunggren**, *Characterization of a heralded single photon source*, Northern Optics, Bergen, Norway (2006).
23. M. Tengner and **D. Ljunggren**, *Optimization of coupling of entangled photon-pairs into single-mode fiber*, (PQ-15-TUE) at the 13th General Conference of the European Physical Society, Bern, Switzerland (2005).
24. **D. Ljunggren**, M. Tengner, M. Pelton, and P. Marsden, *A source of entangled photon-pairs: optimizing emission in two quasi-phasematched crystals*, 7th International Conference on Quantum Communication, Measurement and Computing (QCMC04), Glasgow, UK (2004).
- *25. A. Karlsson, **D. Ljunggren**, M. Tegner, M. Pelton and P. Marsden, *Photon twins and quantum entanglement - from generation to applications*, (invited talk) ETOS 2004: emerging technologies in optical sciences, Cork, Ireland (2004).
- *26. **D. Ljunggren**, P. Marsden, M. Tengner, I. Ghiu, I. Vellekoop and A. Karlsson, *Efficient single-mode generation of degenerate 1550nm entanglement in type-II parametric downconversion*, (talk QTuB3) Quantum Electronics and Laser Science (CLEO-QELS), Baltimore, USA (2003).

- *27. M. Pelton, P. Marsden, **D. Ljunggren**, M. Tengner, A. Karlsson, A. Fragemann, C. Canalias, and F. Laurell, *Bright source of polarisation-entangled photons using periodically poled potassium titanyl phosphate (KTP)*, (talk QThPDB3) Quantum Electronics and Laser Science (CLEO-QELS), Baltimore, USA (2003).
- †*28. A. Karlsson, M. Bourennane, I. Ghiu, **D. Ljunggren**, A. Månsson, *Some properties of three-party entangled states and their application in quantum communication*, (talk) Physics of Communication, Proceedings of the XXII Solvay Conference on Physics (ed. by I. Antoniou et al.), pp 472-484, Delphi Lamia, Greece, (Singapore 2002). Also in Quantum Computers and Computing, **4** (2), pp. 3-14 (2003).
- †29. A. Karlsson, M. Bourennane, **D. Ljunggren**, J. Peña Císcar, M. Mathes and A. Hening, *Quantum communication and single-photon technologies*, ROMOPTO 2000: Sixth Conference on Optics (ed. by V. I. Vlad), Proc. SPIE **4430**, 430-441 (2001).
- *30. A. Karlsson, M. Bourennane, **D. Ljunggren**, I. Ghiu and R. Viana Ramos, *Long wavelength quantum cryptography and entanglement manipulations*, (invited talk QECCB2) at International Conference on Quantum Information (ICQI), Rochester, New York, USA (2001).
- *31. A. Karlsson, M. Bourennane and **D. Ljunggren**, *Long wavelength quantum cryptography: A discussion on some issues*, (talk SuM2) at Quantum interference and cryptographic keys: novel physics and advancing technologies (QUICK), Cargèse, Corsica, France (2001).
32. M. Bourennane, **D. Ljunggren**, R. Viana Ramos, M. Mathes, J. Peña Císcar and A. Karlsson, *Single-photon counters in the telecom wavelength region of 1550 nm for quantum information applications*, Optics in Sweden 2001, Kista, Sweden (2001).
33. M. Bourennane, A. Karlsson, G. Björk and **D. Ljunggren**, *Quantum key distribution using multilevel encoding*, 5th International Conference on Quantum Communication, Measurement and Computing (QCMC00), Capri, Italy (2000).
34. **D. Ljunggren**, M. Bourennane and A. Karlsson, *Authority-based user authentication in quantum key distribution*, 5th International Conference on Quantum Communication, Measurement and Computing (QCMC00), Capri, Italy (2000).
- *35. **D. Ljunggren**, M. Bourennane, and A. Karlsson, *User authentication in quantum cryptography based on two-particle entanglement*, (talk) Swedish-Russian Workshop on Entangled Quantum Systems, St. Petersburg, Russia (2000).
- *36. A. Karlsson, M. Bourennane, **D. Ljunggren**, F. Nilsson, J. Peña Císcar, F. Gibson, A. Hening, P. Jonsson, and M. Mathes, *Fundamentally secure information distribution using optical quantum cryptography*, (talk OR9) Northern Optics 2000, Uppsala, Sweden (2000).
- *37. M. Bourennane, A. Karlsson, P. Jonsson, T. Tsegaye, **D. Ljunggren**, F. Gibson, A. Hening and E. Sundberg, *Experiments on long-wavelength (1550 nm) "plug and play" quantum cryptography systems*, (talk QWA4) QELS99, Baltimore, Maryland, USA (1999).
- †*38. A. Karlsson, M. Bourennane, **D. Ljunggren**, P. Jonsson, A. Hening, J. Peña Císcar, M. Koashi and N. Imoto, *Quantum cryptography - from single-photon transmission, key extraction methods to novel quantum information protocols*, (invited talk) IEEE Proceedings of the 1999 Congress on Evolutionary Computation **3**, 2247-2254, Washington DC, USA (1999).
39. M. Bourennane, F. Gibson, A. Hening, A. Karlsson, P. Jonsson, T. Tsegaye, **D. Ljunggren** and E. Sundberg, *Experimental long wavelength quantum cryptography: from single-photon transmission to key extraction protocols*, Complexity, Computation and the Physics of Information, Cambridge, UK (1999).
- *40. A. Karlsson, M. Bourennane, **D. Ljunggren**, J. Peña Císcar, A. Hening, F. Gibson and P. Jonsson, *Quantum cryptography - from qubits to secure databits*, talk at Quantum Optics conference, Mallorca, Spain (1999).

Overview articles

Book chapters, books, etc.

- †41. **D. Ljunggren**, M. Tengner, M. Pelton, and P. Marsden, *A source of entangled photon-pairs: optimizing emission in two quasi-phasematched crystals*, Quantum Communication, Measurement and Computing 5, eds. Barnett *et al.* AIP Conf. Proc. **734**, 354, (Melville, New York 2004). ISBN: 0-7354-0216-7
- †42. **D. Ljunggren**, M. Bourennane and A. Karlsson, *Authority-based user authentication and quantum key distribution*, Quantum Communication, Computing, and Measurement 3, eds. P. Tombesi and O. Hirota, 299-302 (Plenum, New York, 2001). ISBN: 0-306-46609-0
- *43. **D. Ljunggren**, *Entanglement in quantum communication: preparation and characterization of photonic qubits*. Ph.D. thesis, Royal Institute of Technology (Feb. 2006). ISBN: 91-7178-254-0
- 44. **D. Ljunggren**, *Protocols in quantum cryptography systems: implementation of software for secret key extraction*. M.Sc. thesis, Royal Institute of Technology (1999).

Publicly available computer programs

The following software is developed by the applicant and available upon request.

- Software for Quantum Cryptography Key Extraction.
- Software for Emission Modelling in Spontaneous Parametric Downconversion.

Popular-scientific articles/presentations

- 45. A. Karlsson **D. Ljunggren**, and M. Tengner, *Twin-photon sources for quantum information applications*, in Quantum Information Processing and Communication in Europe, Information Society Technologies FET, EU (2005).
- 2002 – 2005 Contribution to popular scientific coverage on Swedish national television; Nova, Aktuellt, Vetenskap.

Other presentations

- *46. **D. Ljunggren**, *Photon statistics of heralded single-photon sources*, Meeting in honor of Nobel laureate Roy Glauber, Department of Microelectronics and Applied Physics, KTH, Sweden (2005).
- *47. **D. Ljunggren**, *Preparation of entangled photonic qubits in controlled temporal and spatial domains for the use in long-distance quantum communication*, (invited talk) Department of Physics, Clarendon Laboratory, University of Oxford, UK (2007).
- *48. **D. Ljunggren**, *Preparation of hybrid-coded entangled photonic qubits in controlled temporal and spatial domains for the use in long-distance quantum communication*, (invited talk) Institute of Photonic Sciences (ICFO), Barcelona, Spain (2007).
- *49. **D. Ljunggren**, *Down Purcell's road... Spatial and temporal single-photon control: from cavities to heralding*, Department of Physics, Clarendon Laboratory, University of Oxford, UK (2009).