

# Curriculum Vitae: Cosmo LUPO

23/7/2020

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## Italian National Scientific Abilitation

2018: Theoretical Physics – Condensed Matter (02/B2). Associate professor level (Fascia II).

2019: Theoretical Physics – Fundamental Interactions (02/A2). Associate professor level (Fascia II).

## Education and training

2018: Research Leaders programme. University of York.  
<https://www.york.ac.uk/admin/hr/organisational-development/leadership-and-management/research-leaders/>

2015: Kaufman Teaching Certificate. Massachusetts Institute of Technology.  
<https://tll.mit.edu/ktcp>

2004 – 2007: Ph.D. in Fundamental and Applied Physics. University of Napoli 'Federico II', Napoli, Italy. Title of the dissertation: *On the robustness of holonomic quantum computation*.

2006 – 2007: Research visitor, Max Planck Institut fuer Quantenoptik, Garching, Germany.

1998 – 2004: Laurea in Physics (5 years degree) 110/110 summa cum laude. University of Napoli Federico II', Napoli, Italy. Title of the dissertation: *A differential geometric approach to open system: quantum channels on symplectic manifolds*.

## Current and previous employment

10/2018 – today: Research Associate. Department of Physics and Astronomy, University of Sheffield.

10/2016-8/2018: Research Associate. Department of Computer Science, University of York.

07/2016 – 09/2016: Parental leave.

05/2016 – 06/2016: Research Associate. Department of Computer Science, University of York.

09/2015 – 04/2016: Parental leave.

2014 – 2015: Senior Postdoctoral Associate and MIT--SUTD Graduate Fellow. Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge MA, USA

- 2012 – 2014: Postdoctoral Associate. Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge MA, USA.
- 2011 – 2012: Assegnista di ricerca. School of Science and Technology, University of Camerino, Camerino, Italy.
- 2008 – 2011: Postdoc. School of Science and Technology, University of Camerino, Camerino, Italy.
- 2007 – 2008: Postdoc (Marie Curie Training Network 'CONQUEST'). MRTN-CT-2003-505089), Research Center for Quantum Information (RCQI), Slovak Academy of Science, Bratislava, Slovak Republic.

### **Fellowships and Scholarships obtained**

- 2015: Awarded a fellowship by the MIT-SUTD Graduate Fellow Program (value: 144,000 US\$).
- 2004: Awarded a full PhD scholarship. The scholarship was funded by the Italian Ministry of Education after a public competitive examination (value: 30,000 €).

### **Other research fundings I have applied for**

- 2019: ERC (European Research Council) - Consolidator Grant. Ranking range: 88% - 100%.  
QuantERA (ERA-NET Cofund in Quantum Technologies, European Commission).
- 2018: EPSRC fellowship. Score from four referees: 5/6, 5/6, 6/6, 6/6.  
Strathclyde Global Talent Programme (Chancellor's Fellow).
- 2017: EPSRC UKRI Innovation Fellowship.
- 2016: Marie Skłodowska-Curie Action - Individual Fellowship. Total score: 78.00%.
- 2015: EPSRC Quantum Technology fellowship. Score from two referees: 3/6, 6/6. I was invited to the interview.  
Marie Skłodowska-Curie Action - Individual Fellowship. Total score: 83.20%
- 2013: FIRB - Futuro in Ricerca (Grant of the Italian Ministry of Education).
- 2012: Anniversary Research Lectureship, University of York.  
Marie Skłodowska-Curie Action - Individual Fellowship. Total score: 84.60%.
- 2009: FIRB - Futuro in Ricerca (Grant of the Italian Ministry of Education).

## Intellectual Property

Apparatus and methods for locked quantum communication using photonic integrated circuits, United States Patent No. 10,126,506 (2017).

## Industrial engagement

- 2016 – 19: Member of Qubiz-Quantum Innovation Center, funded by Innovation Fund Denmark.
- 2020: Collaborator of the project “Quantum Random Number Generator”, funded by Innovation Fund Denmark.

## Public engagement

- 2018: I have participated as a stakeholder (subject expert) to the EPSRC public dialogue on Quantum Technologies.  
<https://epsrc.ukri.org/newsevents/news/epsrc-publishes-results-of-public-dialogue-on-quantum-technologies/>

## Teaching

- 2019, 2020: Module leader. The physics of sustainable energies. Department of Physics and Astrophysics, University of Sheffield.
- 2017: Guest Lecturer. Cryptography Theory & Applications. Department of Computer Science, University of York.
- 2015: Instructor. Physics 802: Electricity and Magnetism. Experimental Study Group, MIT, Cambridge MA.
- 2014: Teaching assistant. Physics 801: Classical Mechanics. Experimental Study Group, MIT, Cambridge MA.
- 2012: Trainer for the Olympic games of physics. University of Camerino.
- 2011, 2012: Instructor. Classical and quantum information theory. University of Camerino.
- 2011: Science teacher. Secondary school “Mestica”, Macerata (Italy).
- 2010: Tutor. General Physics, for undergraduate students in physics, mathematics and computer science. University of Camerino.

## Mentoring

- 2017 – 18: Dr Riccardo Laurenza and Dr Panagiotis Papanastasiou, when they were PhD students at the Department of Computer Science, University of York.
- 2015 – 16: Dr Daniel Lum, when he was graduate student at the University of Rochester (USA).
- 2012-13: Dr Andreas Christ, when he was PhD student at the University of Paderborn, Germany.

- 2012: Wulayimu Maimaiti, when he was a master student at the University of Camerino, Italy.
- 2006 – 07: Dr Mario Napolitano, when he was a master student at the University of Napoli, Italy.

### **Awards**

- 2019: Award for teaching excellence in early-career staff, by the Head of Department of Physics and Astronomy of the University of Sheffield. The motivation was that I “took the leadership of a module with very short notice and received excellent student feedback, having clearly delivered very high quality teaching.”
- 2018: Making the Difference Award, by the Head of the Department of Computer Science of the University of York, in recognition of my outstanding contribution to the Department vision and objectives.  
<https://www.cs.york.ac.uk/staff/administration/making-the-difference/>
- 2016: My paper “Ultimate precision limits of quantum and sub-Rayleigh imaging” was highlighted as Editors's suggestion by Physical Review Letters.
- My paper “A Quantum Enigma Machine: Experimentally Demonstrating Quantum Data Locking” was highlighted as Editors's suggestion by Physical Review A.
- 2011: My paper “Quantum reading capacity” was included in the list of Highlights of 2011 for the section Quantum Physics of New Journal of Physics.

### **Professional activity**

Associate editor for “Quantum Measurements and Quantum Metrology” (de Gruyter).

Grant reviewer for: Natural Sciences and Engineering Research Council of Canada (NSERC), National Science Centre, Poland, Italian Ministry of Education, Universities and Research (MIUR).

Peer-reviewer for: Physical Review Letters, Quantum, New Journal of Physics, New Physics Journal Quantum Information, Physical Review A, Journal of Physics A, Physica Scripta, Optics Letters, Quantum Information and Computation, Entropy, IEEE Transactions on Information Theory, Scientific Reports.

### **Invited talks**

- 2019: York Interdisciplinary Workshop on Aspects of Cyber Security. “Quantum enigma machines”
- 2018: IoP Photon 2018, Aston University, Birmingham. “Advances in continuous-variable quantum key distribution”
- Telecom ParisTech, Paris. “Quantum data locking for key distribution and direct communication”

- 2017: Italian Quantum Information Science Conference, Florence. “Ultimate bounds for parameter estimation in quantum optics, cryptography and imaging”
- 2016: University of Nottingham. Symposium on Advances in Optical Metrology. “Ultimate precision limits for quantum sub-Rayleigh imaging”
- 2015: Universite’ Libre de Bruxelles. “Quantum secret-key bootstrapping”
- 2014: University of Salerno, Salerno, Italy. “Quantum data locking and quantum discord”  
Louisiana State University, Baton Rouge LA, USA. “Quantum data locking, enigma machines and entropic uncertainty relations”
- 2013: Waseda University, Tokyo, Japan. “Quantum enigma machines and the locking capacity of a quantum channel”
- 2010: Max-Planck-Institute for the Science of Light, Erlangen, Germany. “Communication through quantum channels with memory”
- 2007: Atom Chip Group, Ben-Gurion University of the Negev, Be'er Sheva, Israel. “On the Robustness of Holonomic Quantum Computation”  
RCQI, Bratislava, Slovakia. “Robustness of Holonomic Computation under parametric noise”
- 2006: Max Planck Institut fuer Quantenoptik, Garching, Germany. “Robustness against parametric noise of non ideal holonomic gates”  
Universita’ di Milano, Milano, Italy. “Quantum information processing with multiphoton states and linear optics”.

## Full List of Publications

I have a track record of 63 research papers published in peer-reviewed journals (or accepted for publication), and I am the first author of 32 of them. I also have 12 publications in conference proceedings and 4 preprints available on the arXiv.

In total, my papers have been cited more than 1300 times, and my h-factor is 21 (Google Scholar).

### Preprints

Z. Huang, P. Kok, C. Lupo

Protecting the output of a quantum computer with random circuit samplers

arXiv: 2003.11470 (2020)

<https://arxiv.org/abs/2003.11470>

C. Lupo

Towards a practical security analysis of continuous-variable quantum key distribution: new developments and limitations

arXiv:1911.04799 (2019)

<https://arxiv.org/abs/1911.04799>

Z. Huang, P. P. Rohde, D. W. Berry, P. Kok, J. P. Dowling, C. Lupo

Boson Sampling Private-Key Quantum Cryptography

arXiv:1905.03013 (2019)

<https://arxiv.org/abs/1905.03013>

T. Gehring, C. Lupo, A. Kordts, D. Solar Nikolic, N. Jain, T. B. Pedersen, S. Pirandola, U. L. Andersen

Ultra-fast real-time quantum random number generator with correlated measurement outcomes and rigorous security certification

arXiv:1812.05377 (2018)

<https://arxiv.org/abs/1812.05377>

### Papers published (or accepted for publication) in peer-reviewed journals

C. Lupo, Z. Huang, P. Kok

Quantum Limits to Incoherent Imaging are Achieved by Linear Interferometry

Phys. Rev. Lett. **124**, 080503 (2020)

<https://doi.org/10.1103/PhysRevLett.124.080503>

C. Lupo

Subwavelength quantum imaging with noisy detectors

Phys. Rev. A **101**, 022323 (2020)

<https://doi.org/10.1103/PhysRevA.101.022323>

C. Ottaviani, C. Lupo, R. Laurenza, S. Pirandola

Modular network for high-rate quantum conferencing

Commun. Physics **2**, 118 (2019)

<https://doi.org/10.1038/s42005-019-0209-6>

S. Pirandola, U. L. Andersen, L. Banchi, M. Berta, D. Bunandar, R. Colbeck, D. Englund, T. Gehring, C. Lupo, C. Ottaviani, J. Pereira, M. Razavi, J. S. Shaari, M. Tomamichel, V. C. Usenko, G. Vallone, P. Villoresi, P. Wallden

Accepted for publication in Advances in Optics and Photonics

arXiv:1906.01645 (2019)

<https://arxiv.org/abs/1906.01645>

R. Laurenza, C. Lupo, S. Lloyd, S. Pirandola  
Dense coding capacity of a quantum channel

Phys. Rev. Research **2**, 023023 (2019)

<https://doi.org/10.1103/PhysRevResearch.2.023023>

S. Pirandola, R. Laurenza, C. Lupo, J. L. Pereira  
Fundamental limits to quantum channel discrimination

npj Quantum Information **5**, 3 (2019)

<https://doi.org/10.1038/s41534-019-0162-y>

C. Ottaviani, C. Lupo, A. Ferraro, M. Paternostro, S. Pirandola  
Multipartite Entanglement Swapping and Mechanical Cluster States

Phys. Rev. A **99**, 030301(R) (2019)

<https://doi.org/10.1103/PhysRevA.99.030301>

C. Lupo, C. Ottaviani, P. Papanastasiou, S. Pirandola

Parameter estimation with almost no public communication for continuous-variable quantum key distribution

Phys. Rev. Lett. **120**, 220505 (2018)

<https://doi.org/10.1103/PhysRevLett.120.220505>

P. Papanastasiou, C. Lupo, C. Weedbrook, S. Pirandola

Quantum key distribution with phase-encoded coherent states: Asymptotic security analysis in thermal-loss channels

Phys. Rev. A **98**, 012340 (2018)

<https://doi.org/10.1103/PhysRevA.98.012340>

G. Spedalieri, C. Lupo, S. L. Braunstein, S. Pirandola

Thermal quantum metrology in memoryless and correlated environments

Quantum Sci. Technol. **4**, 015008 (2019)

<https://doi.org/10.1088/2058-9565/aae284>

C. Lupo, C. Ottaviani, P. Papanastasiou, S. Pirandola

Continuous-variable measurement-device-independent quantum key distribution: Composable security against coherent attacks

Phys. Rev. A **97**, 052327 (2018).

<https://doi.org/10.1103/PhysRevA.97.052327>

R. Laurenza, C. Lupo, G. Spedalieri, S. L. Braunstein, S. Pirandola

Channel Simulation in Quantum Metrology

Quantum Meas. Quantum Metrol. **5**, 1 (2018)

<https://doi.org/10.1515/qmetro-2018-0001>

S. Pirandola, C. Lupo

Ultimate precision of adaptive quantum metrology

Phys. Rev. Lett. **118**, 100502 (2017)

<https://doi.org/10.1103/PhysRevLett.118.100502>

J. Notaros, J. Mower, M. Heuck, C. Lupo, N. C. Harris, G. R. Steinbrecher, D. Bunandar, T. Baehr-Jones, M. Hochberg, S. Lloyd, D. Englund

Programmable dispersion on a photonic integrated circuit for classical and quantum applications

Optics Express **25**, 21275 (2017)

<https://doi.org/10.1364/OE.25.021275>

C. Lupo, S. Pirandola

Super-Additivity and Entanglement Assistance in Quantum Reading

Quantum Inf. Comput. **17**, 0611 (2017)

<https://doi.org/10.26421/QIC17.7-8>

C. Lupo, S. Pirandola

Ultimate precision limits for quantum and sub-Rayleigh imaging

Phys. Rev. Lett. **117**, 190802 (2016) [Editors' suggestion]

<https://doi.org/10.1103/PhysRevLett.117.190802>

D. J. Lum, M. S. Allman, T. Gerrits, C. Lupo, V. B. Verma, S. Lloyd, S. W. Nam, J. C. Howell

A Quantum Enigma Machine: Experimentally Demonstrating Quantum Data Locking

Phys. Rev. A **94**, 022315 (2016) [Editors' suggestion]

<https://doi.org/10.1103/PhysRevA.94.022315>

C. Lupo, M. M. Wilde, S. Lloyd

Quantum data hiding in the presence of noise

IEEE Trans. Inf. Theory **62**, 3745 (2016)

<https://doi.org/10.1109/TIT.2016.2552547>

C. Lupo

Quantum Data Locking for Secure Communication against an Eavesdropper with Time-Limited Storage

Entropy **17**, 3194 (2015)

<https://doi.org/10.3390/e17053194>

C. Lupo, S. Lloyd

Continuous-variable quantum enigma machines for long-distance key distribution

Phys. Rev. A **92**, 062312 (2015)

<https://doi.org/10.1103/PhysRevA.92.062312>

X. Wang, M. Allegra, K. Jacobs, S. Lloyd, C. Lupo, M. Mohseni

Quantum Brachistochrone Curves as Geodesics: Obtaining Accurate Minimum-Time Protocols for the Control of Quantum Systems

Phys. Rev. Lett. **114**, 170501 (2015)

<https://doi.org/10.1103/PhysRevLett.114.170501>

C. Lupo, S. Lloyd

Quantum data locking for high-rate private communication

New J. Phys. **17**, 033022 (2015)

<https://doi.org/10.1088/1367-2630/17/3/033022>



S. Guha, P. Hayden, H. Krovi, S. Lloyd, C. Lupo, J. H. Shapiro, M. Takeoka, M. M. Wilde  
Quantum enigma machines and the locking capacity of a quantum channel  
Phys. Rev. X **4**, 011016 (2014)  
<https://doi.org/10.1103/PhysRevX.4.011016>

C. Lupo, S. Lloyd  
Quantum-Locked Key Distribution at Nearly the Classical Capacity Rate  
Phys. Rev. Lett. **113**, 160502 (2014)  
<https://doi.org/10.1103/PhysRevLett.113.160502>

F. Caruso, V. Giovannetti, C. Lupo, S. Mancini  
Quantum channels and memory effects  
Rev. Mod. Phys. **86**, 1203 (2014)  
<https://doi.org/10.1103/RevModPhys.86.1203>

O. C. O. Dahlsten, C. Lupo, S. Mancini, A. Serafini  
Entanglement Typicality  
J. Phys. A: Math. Theor. **47**, 363001 (2014)  
<https://doi.org/10.1088/1751-8113/47/36/363001>

A. Christ, C. Lupo, M. Reichelt, T. Meier, C. Silberhorn  
Theory of filtered type-II parametric down-conversion: A method for single-mode EPR-  
entanglement generation  
Phys. Rev. A **90**, 023823 (2014)  
<https://doi.org/10.1103/PhysRevA.90.023823>

C. Lupo, M. M. Wilde, S. Lloyd  
Robust quantum data locking from phase modulation  
Phys. Rev. A **90**, 022326 (2014)  
<https://doi.org/10.1103/PhysRevA.90.022326>

M. Rafiee, C. Lupo, S. Mancini  
Noise to lubricate qubit transfer in a spin network  
Phys. Rev. A **88**, 032325 (2013)  
<https://doi.org/10.1103/PhysRevA.88.032325>

C. Lupo, S. Pirandola, V. Giovannetti, S. Mancini  
Quantum reading capacity under thermal and correlated noise  
Phys. Rev. A **87**, 062310 (2013)  
<https://doi.org/10.1103/PhysRevA.87.062310>

C. Lupo, M. M. Wilde, S. Mancini  
Stochastic resonance in Gaussian quantum channels  
J. Phys. A **46**, 045306 (2013)  
<https://doi.org/10.1088/1751-8113/46/4/045306>

O. V. Pilyavets, C. Lupo, S. Mancini  
Methods for Estimating Capacities of Gaussian Quantum Channels  
IEEE Trans. Inf. Theory **58**, 6126 (2012)  
<https://doi.org/10.1109/TIT.2012.2191475>

G. Spedalieri, C. Lupo, S. Mancini, S. L. Braunstein, S. Pirandola  
Quantum reading under a local energy constraint  
Phys. Rev. A **86**, 012315 (2012)  
<https://doi.org/10.1103/PhysRevA.86.012315>

C. Lupo, V. Giovannetti, S. Pirandola, S. Mancini, S. Lloyd  
Capacities of linear quantum optical systems  
Phys. Rev. A **85**, 062314 (2012)  
<https://doi.org/10.1103/PhysRevA.85.062314>

M. Rafiee, C. Lupo, H. Mokhtari, S. Mancini  
Stationary and uniform entanglement distribution in qubit networks with quasi-local dissipation  
Phys. Rev. A **85**, 042320 (2012)  
<https://doi.org/10.1103/PhysRevA.85.042320>

A. Christ, C. Lupo, C. Silberhorn  
Exponentially enhanced quantum communication rate by multiplexing continuous-variable teleportation  
New J. Phys. **14**, 083007 (2012)  
<https://doi.org/10.1088/1367-2630/14/8/083007>

C. Lupo, S. Mancini, P. Facchi, G. Florio, S. Pascazio  
Entanglement frustration in multimode Gaussian states  
Int. J. Geom. Methods Mod. Phys. **9**, 1260022 (2012)  
<https://doi.org/10.1142/S0219887812600225>

C. Cafaro, A. Giffin, C. Lupo, S. Mancini  
Softening the Complexity of Entropic Motion on Curved Statistical Manifolds  
Open Sys. & Information Dyn. **19**, 1250001 (2012)  
<https://doi.org/10.1142/S1230161212500011>

C. Lupo, L. Memarzadeh, S. Mancini  
Removing correlations in signals transmitted over a quantum memory channel  
Phys. Rev. A **85**, 012320 (2012)  
<https://doi.org/10.1103/PhysRevA.85.012320>

C. Lupo, S. Mancini, A. De Pasquale, P. Facchi, G. Florio, S. Pascazio  
Invariant measures on multimode quantum Gaussian states  
J. Math. Phys. **53**, 122209 (2012)  
<https://doi.org/10.1063/1.4768712>

S. Pirandola, C. Lupo, V. Giovannetti, S. Mancini, S. L. Braunstein  
Quantum reading capacity  
New J. Phys. **13**, 113012 (2011)  
<https://doi.org/10.1088/1367-2630/13/11/113012>

C. Lupo, S. Pirandola, P. Aniello, S. Mancini  
On the classical capacity of quantum Gaussian channels  
Phys. Scr. **T143**, 014016 (2011)  
<https://doi.org/10.1088/0031-8949/2011/T143/014016>

C. Lupo, V. Giovannetti, S. Pirandola, S. Mancini, S. Lloyd  
Enhanced quantum communication via optical refocusing  
Phys. Rev. A **84**, 010303(R) (2011)  
<https://doi.org/10.1103/PhysRevA.84.010303>

C. Cafaro, S. L'Innocente, C. Lupo, S. Mancini  
Quantifying the Performance of Quantum Codes  
Open Sys. & Information Dyn. **18**, 1 (2011)  
<https://doi.org/10.1142/S1230161211000029>

C. Lupo, V. Giovannetti, S. Mancini  
Capacities of Lossy Bosonic Memory Channels  
Phys. Rev. Lett. **104**, 030501 (2010)  
<https://doi.org/10.1103/PhysRevLett.104.030501>

C. Lupo, V. Giovannetti, S. Mancini  
Memory effects in attenuation and amplification quantum processes  
Phys. Rev. A **82**, 032312 (2010)  
<https://doi.org/10.1103/PhysRevA.82.032312>

C. Lupo, S. Mancini  
Transitional behavior of quantum Gaussian memory channels  
Phys. Rev. A **81**, 052314 (2010)  
<https://doi.org/10.1103/PhysRevA.81.052314>

S. L'Innocente, C. Lupo, S. Mancini  
Qubit Dynamics in a q-Deformed Oscillators Environment  
Open Sys. & Information Dyn. **17**, 73 (2010)  
<https://doi.org/10.1142/S1230161210000060>

C. Lupo, S. Mancini  
Entanglement enhanced bit rate over multiple uses of a lossy bosonic channel with memory  
Optics & Spectroscopy **108**, 319 (2010)  
<https://doi.org/10.1134/S0030400X1003001X>

C. Lupo, O. V. Pilyavets, S. Mancini  
Capacities of lossy bosonic channel with correlated noise  
New J. Phys. **11**, 063023 (2009)  
<https://doi.org/10.1088/1367-2630/11/6/063023>

S. L'Innocente, C. Lupo, S. Mancini  
Quantum state transfer in a q-deformed chain  
J. Phys. A: Math. Theor. **42**, 475305 (2009)  
<https://doi.org/10.1088/1751-8113/42/47/475305>

P. Facchi, G. Florio, C. Lupo, S. Mancini and S. Pascazio  
Gaussian maximally multipartite-entangled states  
Phys. Rev. A **80**, 062311 (2009)  
<https://doi.org/10.1103/PhysRevA.80.062311>

- C. Lupo, L. Memarzadeh, S. Mancini  
Forgetfulness of continuous Markovian quantum channels  
Phys. Rev. A **80**, 042328 (2009)  
<https://doi.org/10.1103/PhysRevA.80.042328>
- P. Aniello, C. Lupo  
On the relation between Schmidt coefficients and entanglement  
Open Sys. & Information Dyn. **16**, 127 (2009)  
<https://doi.org/10.1142/S1230161209000104>
- C. Lupo, P. Aniello  
Robustness of geometric phase under parametric noise  
Phys. Scr. **79**, 065012 (2009)  
<https://doi.org/10.1088/0031-8949/79/06/065012>
- C. Lupo, P. Aniello, A. Scardicchio  
Bipartite quantum systems: on the realignment criterion and beyond  
J. Phys. A: Math. Theor. **41**, 415301 (2008)  
<https://doi.org/10.1088/1751-8113/41/41/415301>
- P. Aniello, C. Lupo  
A class of inequalities inducing new separability criteria for bipartite quantum systems  
J. Phys. A: Math. Theor. **41**, 355303 (2008)  
<https://doi.org/10.1088/1751-8113/41/35/355303>
- C. Lupo, V. I. Man'ko and G. Marmo  
Qubit-portraits of qudit states and quantum correlations  
J. Phys. A: Math. Theor. **40**, 13091 (2007)  
<https://doi.org/10.1088/1751-8113/40/43/016>
- C. Lupo, P. Aniello, M. Napolitano and G. Florio  
Robustness against parametric noise of non ideal holonomic gates  
Phys. Rev. A **76**, 012309 (2007)  
<https://doi.org/10.1103/PhysRevA.76.012309>
- P. Aniello, C. Lupo, M. Napolitano, M. G. A. Paris  
Engineering multiphoton states for linear optics computation  
Eur. Phys. J. D **41**, 579 (2007)  
<https://doi.org/10.1140/epjd/e2006-00259-y>
- P. Aniello, C. Lupo, M. Napolitano  
Exploring Representation Theory of Unitary Groups via Linear Optical Passive Devices  
Open Sys. & Information Dyn. **13**, 415 (2006)  
<https://doi.org/10.1007/s11080-006-9023-1>
- C. Lupo, V. I. Man'ko, G. Marmo  
Bell's inequalities in the tomographic representation  
J. Phys. A: Math. Gen. **39**, 12515 (2006)  
<https://doi.org/10.1088/0305-4470/39/40/016>

C. Lupo, V. I. Man'ko, G. Marmo and E. C. G. Sudarshan  
Partial scaling transform of multiqubit states as a criterion of separability  
J. Phys. A: Math. Gen. **38**, 10377 (2005)  
<https://doi.org/10.1088/0305-4470/38/48/009>

### Conference proceedings

A. Kordts, C. Lupo, D. S. Nikolic, T. B. Pedersen, T. Gehring, U. L. Andersen  
Security verification for vacuum fluctuation based quantum random number generator  
CLEO: QELS Fundamental Science, JTh2A. 10 (2018)

X. Wang, M. Allegra, K. Jacobs, S. Lloyd, C. Lupo, M. Mohseni  
Time-optimal quantum control via differential geometry  
SPIE OPTO, 101180F (2017)

J. Notaros, J. Mower, M. Heuck, N. Harris, G. Steinbrecher, D. Bunandar, C. Lupo, T. Baehr-Jones,  
M. Hochberg, S. Lloyd, D. R. Englund  
Tunable-Coupling Resonator Arrays for Chip-Based Quantum Enigma Machines  
CLEO: QELS Fundamental Science, FTh4C. 4 (2016)

D. J. Lum, J. C. Howell, M. S. Allman, T. Gerrits, V. B. Verma, S. W. Nam, C. Lupo, S. Lloyd  
Experimentally Demonstrating Quantum Data Locking with a Quantum Enigma Machine  
Frontiers in Optics/Laser Science, FW2B.5 (2016)

A. Christ, B. Brecht, G. Harder, A. Eckstein, V. Ansari, C. Lupo, C. Silberhorn  
Quantum communication with ultrafast multimode pulsed light  
Photonics Society Summer Topical Meeting Series, 2013 IEEE, pages 175 - 176

C. Lupo, S. Pirandola, V. Giovannetti, S. Mancini, S. L. Braunstein  
Quantum Reading Capacity  
Research in Optical Sciences, OSA Technical Digest (Optical Society of America, 2012), paper  
QW1B.5

C. Cafaro, A. Giffin, C. Lupo, S. Mancini  
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