

**Personal****Address**

Centre for Quantum Information & Communication (QuIC)  
CP 165/59  
Ecole Polytechnique  
Université Libre de Bruxelles  
50 av. F. D. Roosevelt  
B-1050 Bruxelles  
Belgium

**Telephone**

+32 2 650 2973

**Email**

[pilyavets@gmail.com](mailto:pilyavets@gmail.com)

**PGP key**

BDA0 699B 414F 5B00 8695 844A 57F8 2C72 347D 8201

**Citizenship**

Russia

**Web**

<http://quic.ulb.ac.be/members/oleg>

**Education****University of Camerino**

Italy. *Feb 2007 – Mar 2010*

*Doctor of Philosophy, Physics*

*Focus: Information transmission through Gaussian quantum channels with memory*

*Supervisor: Prof. Stefano Mancini*

**P. N. Lebedev Physical Institute of the Russian Academy of Sciences**

Moscow, Russia. *Jul 2006 – Aug 2009*

*Doctor of Philosophy, Physics*

*Focus: Probability representation of quantum mechanics, symplectic and spin tomography*

*Research project: Some questions on application of probability representation in quantum mechanics*

*Supervisor: Prof. Vladimir Man'ko*

**Moscow Institute of Physics and Technology (State University)**

Moscow, Russia. *Sep 2004 – Jun 2006*

*Master of Science in Physics, Faculty of Physics and Power Problems*

*Major: Applied mathematics and physics*

*Focusing on plasmic power engineering*

*Research project: Development of tomographic representation approach for solution of some problems in mechanics*

*Advisors: Prof. Vladimir Man'ko and Prof. Anatoliy Napartovich*

**Moscow Institute of Physics and Technology (State University)**

Moscow, Russia. *Sep 2001 – Jun 2004*

*Bachelor of Science in Physics, Faculty of Physics and Power Problems*

*Major: Applied mathematics and physics*

*Focusing on plasmic power engineering*

*Research project: Study of optical properties of plane-layered structures*

*Advisor: Prof. Anatoliy Napartovich*

**Altai State University**

Barnaul, Russia. *Sep 1999 – Jun 2001*

*Faculty of Physics and Technology*

*Major: Radiophysics and electronics*

**Journal publications**

Here and below main  
coauthor is underlined

**Capacities of bosonic Gaussian quantum channels**

- [1] J. Schäfer, E. Karpov, O. V. Pilyavets, N. J. Cerf. *Classical capacity of phase-sensitive Gaussian quantum channels*. E-print arXiv:1609.04119 [quant-ph] (2016).
- [2] J. Schäfer, E. Karpov, R. García-Patrón, O. V. Pilyavets, N. J. Cerf. *Equivalence relations for the classical capacity of single-mode Gaussian quantum channels*. E-print arXiv:1303.4939 [quant-ph] (2013). *Phys. Rev. Lett.* **111**:3, 030503-1-030503-5 (2013).
- [3] O. V. Pilyavets, C. Lupo, S. Mancini. *Methods for estimating capacities and rates of Gaussian quantum channels*. E-print arXiv:0907.1532 [quant-ph] (2009-2011). *IEEE Trans. Inf. Theory* **58**:9, 6126-6164 (2012).
- [4] C. Lupo, O. V. Pilyavets, S. Mancini. *Capacities of lossy bosonic channel with correlated noise*. E-print arXiv:0901.4969 [quant-ph] (2009). *New J. Phys.* **11**:6, 063023 18pp (2009).
- [5] O. V. Pilyavets, V. G. Zborovskii, S. Mancini. *Lossy bosonic quantum channel with non-Markovian memory*. E-print arXiv:0802.3397 [quant-ph] (2008). *Phys. Rev. A* **77**:5, 052324-1-052324-8 (2008).

**Probability representation of quantum mechanics**

- [1] V. N. Chernega, O. V. Man'ko, V. I. Man'ko, O. V. Pilyavets, V. G. Zborovskii. *Tomographic characteristics of spin states*. *J. Russ. Laser Res.* **27**:2, 132-166 (2006).
- [2] O. V. Man'ko, V. I. Man'ko, O. V. Pilyavets. *Probability representation of classical states*. *J. Russ. Laser Res.* **26**:6, 429-444 (2005).
- [3] V. I. Man'ko, O. V. Pilyavets. *Entangled Gaussian states of a two-dimensional nonstationary damped oscillator*. *J. Russ. Laser Res.* **26**:4, 259-272 (2005).

**Conference proceedings**

- [1] O. V. Pilyavets, E. Karpov, J. Schäfer. *Superadditivity of classical capacity revisited*. In: H.-J. Schmiedmayer and P. Walther (eds.), *Proceedings of 11th International Conference on Quantum Communication, Measurement and Computing (QCMC)* (Vienna, Austria, 30 July – 3 August, 2012), *AIP Conf. Proc.* **1633**, 189-191 (2014).
- [2] E. Karpov, J. Schäfer, O. V. Pilyavets, R. García-Patrón, N. J. Cerf. *Gaussian classical capacity of Gaussian quantum channels*. In: N. F. Morozov and I. Yu. Popov (eds.), *Proceedings of International Conference "Mathematical Challenge of Quantum Transport in Nanosystems – 2013" (Pierre Duclos Workshop)* (St. Petersburg, Russia, 13-15 March, 2013), *Nanosystems: Physics, Chemistry, Mathematics* **4**:4, 496-506 (2013).
- [3] O. V. Pilyavets, V. G. Zborovskii, S. Mancini. *A lossy bosonic quantum channel with non-Markovian memory*. In: A. Lvovsky (ed.), *Proceedings of 9th International Conference on Quantum Communication, Measurement and Computing (QCMC)* (Calgary, Canada, 19-24 August, 2008), *AIP Conf. Proc.* **1110**, 123-126 (2009).

**Other publications**

- [1] V. I. Man'ko, O. V. Pilyavets, V. G. Zborovskii. *Probability representation of quantum mechanics: comments and bibliography*. E-print arXiv:quant-ph/0608251 (2006).

## Talks and posters

Coauthor who presented the work is underlined

- [ 1 ] Contributed talk. E. Karpov, J. Schäfer, O. V. Pilyavets, N. J. Cerf, *Optimal environment for quantum bosonic Gaussian channels*. 22nd Central European Workshop on Quantum Optics (CEWQO), Warsaw, Poland. 6–10 July, 2015.
- [ 2 ] Contributed talk. J. Schäfer, E. Karpov, O. V. Pilyavets, N. J. Cerf. *Gaussian capacity of the single-mode Gaussian quantum channel*. 21st Central European Workshop on Quantum Optics (CEWQO), Brussels, Belgium. 23–27 June, 2014.
- [ 3 ] Poster. O. V. Pilyavets, E. Karpov, J. Schäfer. *The channel environment that makes classical capacity superadditive*. XVII Conference on Quantum Information Processing (QIP), Barcelona, Spain. 3–7 February, 2014.
- [ 4 ] Contributed talk. O. V. Pilyavets, E. Karpov, J. Schäfer, *et al.* *Transmission of classical information through Gaussian quantum channels*. Conference “Noise, Information & Complexity @ Quantum Scale” (NIC@QS), Ettore Majorana Centre, Erice (Sicily), Italy. 6–12 October, 2013.
- [ 5 ] Poster. O. V. Pilyavets, E. Karpov, V. G. Zborovskii, S. Mancini. *Lossy bosonic quantum channel with fluctuating parameters*. Conference “Noise, Information & Complexity @ Quantum Scale” (NIC@QS), Ettore Majorana Centre, Erice (Sicily), Italy. 6–12 October, 2013.
- [ 6 ] Contributed talk. E. Karpov, J. Schäfer, O. V. Pilyavets, N. J. Cerf. *Gaussian classical capacity of Gaussian quantum channels*. Conference “Mathematical Challenge of Quantum Transport in Nanosystems” (Pierre Duclos Workshop), St. Petersburg, Russia. 13–15 March, 2013.
- [ 7 ] Poster. O. V. Pilyavets, E. Karpov, J. Schäfer. *Superadditivity of classical capacity revisited*. 11th International Conference on Quantum Communication, Measurement and Computing (QCMC), Vienna, Austria. 30 July – 3 August, 2012.
- [ 8 ] Poster. O. V. Pilyavets, E. Karpov, J. Schäfer. *Superadditivity of classical capacity revisited*. 9th International Workshop “Continuous Variable Quantum Information Processing” (CVQIP), Copenhagen, Denmark. 27–30 April, 2012.
- [ 9 ] Invited talk. O. V. Pilyavets, C. Lupo, S. Mancini. *Estimating capacities of Gaussian quantum channels*. Workshop “New Trends in Quantum Dynamics and Quantum Entanglement,” Trieste, Italy. 21–25 February, 2011.
- [10] Poster. O. V. Pilyavets, C. Lupo, S. Mancini. *Classical capacity of a lossy bosonic channel with memory*. Italian Quantum Information Science Conference (IQIS), Camerino, Italy. 24–29 October, 2008.
- [11] Contributed talk. C. Lupo, O. V. Pilyavets, S. Mancini. *Capacities of Gaussian bosonic channel with memory*. Italian Quantum Information Science Conference (IQIS), Camerino, Italy. 24–29 October, 2008.
- [12] Contributed talk. O. V. Pilyavets, V. G. Zborovskii, S. Mancini. *A lossy bosonic quantum channel with non-Markovian memory*. 8th Asian Conference on Quantum Information Science (AQIS), Seoul, Korea. 25–31 August, 2008.

## Other attended conferences, workshops, and meetings

- [ 1 ] Device-Independent Quantum Information Processing and Quantum Algorithms Joint Meeting (DIQIP & QAlgo), Brussels, Belgium. 13–16 May, 2014.
- [ 2 ] Quantum Computer Science, Device-Independent Quantum Information Processing, and Quantum Algorithms Joint Meeting (QCS, DIQIP & QAlgo), Paris, France. 14–17 May, 2013.
- [ 3 ] One-day colloquium on Keccak and SHA-3 “Keccak & SHA-3 Day,” Brussels, Belgium. 27 March 2013.
- [ 4 ] 10th Workshop on Continuous-Variable Quantum Information Processing (CVQIP), Paris, France. 30 January – 1 February, 2013.
- [ 5 ] Conference “Noise, Information & Complexity @ Quantum Scale” (NIC@QS), Ettore Majorana Centre, Erice (Sicily), Italy. 4–10 November, 2007.

**Research visits**

- [ 1 ] Prof. Nicolas Cerf group.  
Centre for Quantum Information & Communication.  
Université Libre de Bruxelles, Brussels, Belgium.  
*9 Nov 2009 – 13 Nov 2009.*

**Current research interests**

- [1] Quantum channels with continuous variables  
[2] Influence of correlations and memory on information transmission  
[3] Applications of quantum computer science to cryptography

**Teaching**

- [1] Information and coding theory. Seminars. Université Libre de Bruxelles, Brussels, Belgium. 2012–2014.

**Work experience****Université Libre de Bruxelles**

Brussels, Belgium. *Sep 2011 – Present*

*Position:* Post-doc in Centre for Quantum Information & Communication (QuIC), Ecole Polytechnique de Bruxelles

*Projects:* Post-doctoral grant “Ouvertures internationales”  
F.R.S.-FNRS (HIPERCOMM)

*Focus:* Capacities of bosonic Gaussian quantum channels

*Group leader:* Prof. Nicolas Cerf

**University of Camerino**

Camerino, Macerata province, Marche region, Italy. *Apr 2010 – Apr 2011*

*Position:* Post-doc in Quantum Optics & Quantum Information Group of  
Physics Department, Faculty of Science and Technology

*Research project:* Quantum channels characterization

*Focus:* Influence of noise on classical capacity of lossy bosonic channel

*Group leader:* Prof. Stefano Mancini

**Troitsk Institute for Innovation and Fusion Research**

Troitsk, Moscow region, Russia. *Oct 2003 – Jun 2006*

*Position:* Computer operator

*Focus:* Optical properties of plane-layered structures

*Group leader:* Prof. Anatoliy Napartovich