

## • PERSONAL INFORMATION

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Date and place of birth: 12 December 1988, Yerevan, Armenia  
Nationality: Armenian  
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## • CURRENT POSITION

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August 2015 to present: **Postdoctoral fellow**  
Centre for Quantum Information and Communication, Université libre de Bruxelles, Belgium  
Employed on H2020 FET-ProActive project QUCHIP (*Quantum simulations on a photonic chip*)  
**Teaching assistant**  
for “Quantum information and computation” and “Information and coding theory” courses at the Ecole polytechnique de Bruxelles, Université libre de Bruxelles

## • PREVIOUS POSITIONS

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August 2014 – July 2015: **Researcher**  
Alikhanyan National Science Laboratory, Armenia  
Institute for Physical Research, Armenia  
July 2011 – July 2014: **PhD fellow**  
CNRS contract, through a competitive international fellowship co-funded by the Conseil Régional de Bourgogne, CNRS (France) & the State Committee of Science (Armenia)  
May 2012 – August 2012: **Early Stage Researcher**  
Ultrafast Quantum Optics and Metrology Group, University of Oxford, UK  
Supervised by J. Nunn and A. Datta  
Competitive funding by Marie Curie ITN project FASTQUAST (*Ultrafast control of quantum systems by strong laser fields*)  
January 2010 – June 2011: **Senior Laboratory Assistant**  
Alikhanyan National Science Laboratory, Yerevan, Armenia

## • EDUCATION

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July 2011 – July 2014: **Doctor of Philosophy (PhD)**  
under joint supervision between Université de Bourgogne (France) and the Institute for Physical Research (Armenia) – degree obtained with high honours (mention très honorable)  
Thesis title: *Entangled States and coherent interaction in resonant media*  
PhD defence at the Institute for Physical Research in January 2014  
PhD defence at the Université de Bourgogne in July 2014  
August 2009 – May 2011: **Master of Theoretical Physics**  
Faculty of Physics, Department of Theoretical Physics, Yerevan State University, Armenia  
Sole recipient of G. Sahakyan’s scholarship for excellent academic achievements

September 2005 – May 2009: **Bachelor of Physics**

Faculty of Physics, Yerevan State University – graduated with honour  
Recipient of “The Knights of Vartan” scholarship for excellent academic achievements

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• **INTERNATIONAL ACTIVITIES & GRANTS**

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- 2014 to present: Involved in Marie Curie FP7 IRSES project **DIONICOS** (*Dynamics of and in complex systems*)
- 2012 – 2014: Involved in the Marie Curie FP7 ERA-WIDE project **IPERA** (*Integrating the Institute for Physical Research of the Republic of Armenia into the European Research Area*)
- 2012 – 2013: French-Armenian project CNRS/SCS **CLASSQUANT** (*Classical and quantum chaos*)
- 2011 – 2016: Member of the International Associated Laboratory **IRMAS** (*Interaction of light with matter: from atoms to solids*) between CNRS (France) & State Committee of Science (Armenia)
- 2010 – 2011: Early Career Support Program grant of the Armenian National Foundation of Science & Advanced Technologies, *Entanglement as a measure of quantum correlations in many-body fermionic and bosonic systems*
- 2010: Scientific research support grant of the Armenian National Science & Education Fund, *Entanglement as a measure of quantum correlations in many-body fermionic systems*

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• **ACADEMIC VISITS**

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- August 2016 & June 2017: invited visitor at Quantum Engineering Technology Labs at the University of Bristol, UK, with Anthony Laing
- February 2015: invited visitor at the Centre for Quantum Information and Communication at the Université libre de Bruxelles, Belgium, with Nicolas Cerf
- November 2014 & February 2015: invited visitor at the Laboratoire Interdisciplinaire Carnot de Bourgogne at the Université de Bourgogne, France, with Stéphane Guérin (within FP7 ERA-WIDE project IPERA)
- March & June 2014: invited visitor at the Department of Physics and Astronomy at the University of Florence, Italy, with Stefano Ruffo
- February – April 2014: seconded researcher within Marie Curie FP7 IRSES project DIONICOS at the Applied Mathematics Research Centre at Coventry University, UK
- July 2012 & April 2013: invited visitor at Laboratoire de Physique Théorique at Université P. Sabatier, France, with Dima Shepelyansky (within the CNRS/SCS project CLASSQUANT)

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• **INVITED SEMINARS**

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1. *Boson sampling with Gaussian measurements*, Quantum Engineering Technology Labs (QET Labs), University of Bristol, UK, June 2017
2. *Quantum-optics inspired algorithm for estimating the permanent of Hermitian positive semidefinite matrices*, Quantum Engineering Technology Labs (QET Labs), University of Bristol, UK, August 2016
3. *Efficient classical simulation of continuous-variable boson sampling*, at PCQC Tutorials in Quantum Information, Paris Centre for Quantum Computing (PCQC), Télécom ParisTech, France, December 2015
4. *Google tools for the analysis of social phenomena*, Frontiers of Modern Physics Seminar Series, Alikhanyan National Science Laboratory, Yerevan, Armenia, April 2015
5. *Generation and distillation of continuous-variable entanglement in Raman-type quantum memories*, Aarhus Institute of Advanced Studies (AIAS), Aarhus University, Denmark, March 2015

6. *The Google matrix and models for opinion formation on social networks*, Centre for Quantum Information and Communication (QuIC), Université libre de Bruxelles, Belgium, February 2015
7. *Distillation of continuous-variable entanglement using realistic quantum memories*, Centre for Quantum Information and Communication (QuIC), Université libre de Bruxelles, Belgium, February 2015
8. *Protocols for generating entanglement by means of light in systems of mutually coupled qubits*, Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne, Dijon, France, November 2014
9. *Entanglement distillation in realistic quantum memories and voter models on scale-free networks*, Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne, Dijon, France, May 2014
10. *PageRank opinion formation Models on Ulam Networks*, Department of Physics and Astronomy, University of Florence, Sesto Fiorentino, March 2014
11. *Compact continuous-variable entanglement distillation in quantum memories and opinion formation models on complex networks*, Clarendon Laboratory, Oxford University, UK, February 2014
12. *Entanglement and magnetic properties of spin-1/2 Ising-Heisenberg spin-lattice models*, Applied Mathematics Research Centre, Coventry University, UK, February 2014
13. *Thermal entanglement of the triangulated Kagome spin lattice*, Department of General Physics, Yerevan State University, Yerevan, Armenia, November 2013
14. *Entangled states and exactly solvable spin-lattice models*, Department of Theoretical Physics, Alikhanyan National Science Laboratory, Yerevan, Armenia, September 2013
15. *Entanglement distillation in systems of interacting atoms and fields*, Institute for Physical Research, Ashtarak, Armenia, October 2012
16. *Quantifying entanglement in systems of qubits*, Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne, Dijon, France, November 2011
17. *Q-state Potts model and the three-periodic window*, Theoretical Physics Department, Yerevan State University, Yerevan, Armenia, November 2010

#### • PUBLICATIONS IN REFEREED JOURNALS

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1. **L. Chakhmakhchyan**, N. J. Cerf, *Boson sampling with Gaussian measurements*, Phys. Rev. A 96, 032326 (2017).
2. N. J. Russel, **L. Chakhmakhchyan**, J. O'Brien, A. Laing, *Direct dialling of Haar random unitary matrices*, New J. Phys. 19, 033007 (2017).
3. **L. Chakhmakhchyan**, N. J. Cerf, R. Garcia-Patron, *A quantum-inspired algorithm for estimating the permanent of positive semidefinite matrices*, Phys. Rev. A 96, 022329 (2017).
4. **L. Chakhmakhchyan**, T. N. Teles, S. Ruffo, *Ensemble inequivalence and absence of quasi-stationary states in long-range random networks*, J. Stat. Mech. 063204 (2017).
5. **L. Chakhmakhchyan**, S. Guérin, C. Leroy, *Chaotic spin-spin entanglement on a recursive lattice*, Phys. Rev. E 92, 022101 (2015).
6. **L. Chakhmakhchyan**, C. Leroy, N. Ananikian, S. Guérin, *Generation of Entanglement in Systems of Intercoupled Qubits*, Phys. Rev. A 90, 042324 (2014).
7. N. Ananikian, R. Artuso, **L. Chakhmakhchyan**, *Superstable Cycles for Antiferromagnetic Q-State Potts and Three-Site Interaction Ising Models on Recursive Lattices*, Commun. Nonlinear Sci. Numer. Simulat. 19, 3671 (2014).
8. **L. Chakhmakhchyan**, S. Guérin, J. Nunn, A. Datta, *A Compact Entanglement Distillery Using Realistic Quantum Memories*, Phys. Rev. A 88, 042312 (2013).
9. **L. Chakhmakhchyan**, D. Shepelyansky, *Pagerank Model of Opinion Formation on Ulam Networks*, Phys. Lett. A 377, 3119 (2013).
10. **L. A. Chakhmakhchyan**, *Entanglement of Effectively Coupled Three Atoms*, Journal of Contemporary Physics (NAS of Armenia) 48, 193 (2013).

11. N. S. Ananikyan, L. N. Ananikian, **L. A. Chakhmakhchyan**, O. Rojas, *Thermal Entanglement of Spin-1/2 Ising-Heisenberg Model on a Symmetrical Diamond Chain*, J. Phys. Condens. Matter 24, 256001 (2012).
12. G. Grigoryan, C. Leroy, **L. Chakhmakhchyan**, Y. Pashayan-Leroy, S. Guérin, H.R. Jauslin, *Stimulated Raman Adiabatic Passage via Bright State in  $\Lambda$  Medium of Unequal Oscillator Strengths*, Eur. Phys. J. D 66, 256 (2012).
13. **L. Chakhmakhchyan**, N. Ananikian, L. Ananikyan, C. Burdik, *Thermal Entanglement of the Spin-1/2 Diamond Chain*, J. Phys: Conf. Series 343, 012022 (2012).
14. **L. Chakhmakhchyan**, G. Grigoryan, C. Leroy, Y. Pashayan-Leroy, S. Guérin, H.R. Jauslin, *Influence of Unequal Oscillator Strengths on Stimulated Raman Adiabatic Passage via Bright State*, Int. J. Mod. Phys.: Conf. Series 15, 147 (2012).
15. N. S. Ananikian, L. N. Ananikyan, **L. A. Chakhmakhchyan**, *Three-periodic Cyclic Window in Antiferromagnetic Potts and Ising Models on Recursive Lattices*, JETP Lett. 94, 39 (2011).
16. N. S. Ananikian, L. N. Ananikyan, **L. A. Chakhmakhchyan**, A. N. Kocharyan, *Magnetic Properties and Thermal Entanglement on a Triangulated Kagome Lattice*, J. Phys. A: Math. Theor. 44, 025001 (2011).
17. N. Ananikian, L. Ananikyan, **L. Chakhmakhchyan**, A. Kocharyan, *Thermal Entanglement and Critical Behavior of Magnetic Properties on Triangulated Kagome Lattice*, Acta Polytechnica 51, 7 (2011).
18. L. N. Ananikyan, N. S. Ananikian, **L. A. Chakhmakhchyan**, *Arnold Tongues and Feigenbaum Exponents of the Rational Mapping for  $Q$ -State Potts Model on Recursive Lattice:  $Q < 2$* , Fractals 18, 371 (2010).

#### • CONTRIBUTED TALKS AND POSTERS

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1. **L. Chakhmakhchyan**, *"Boson sampling with Gaussian measurements"*, International Conference on Integrated Quantum Photonics, Rome, Italy, 2017.
2. **L. Chakhmakhchyan**, N. Cerf, R. Garcia-Patron, *"Approximating the permanent of Hermitian positive semidefinite matrices"*, TQC – Theory of Quantum Computation, Communication and Cryptography, Berlin, Germany, 2016.
3. **L. Chakhmakhchyan**, N. Cerf, R. Garcia-Patron, *"A Classical linear-optical algorithm inspired by the boson sampling model"*, 3rd Seefeld workshop on Quantum Information, Seefeld, Austria, 2016.
4. **L. Chakhmakhchyan**, *"A Classical algorithm inspired by the boson sampling model"*, Heilbronn and QALGO quantum algorithms meeting 2016, Cambridge, UK, 2016, book of abstracts, p.2.
5. **L. Chakhmakhchyan**, S. Guérin, C. Leroy, N. Ananikian, *"Preparation of Greenberger-Horne-Zeilinger and  $W$  States in Systems of Intercoupled Qubits"*, The 1st International Conference for Young Quantum Information Scientists – YQIS, Paris, France, 2015, book of abstracts, p.26.
6. **L. Chakhmakhchyan**, S. Guérin, C. Leroy, N. Ananikian, *"Preparation of two- and three-qubit entangled states in systems of mutually coupled qubits"*, International Conference and Workshop "Quanta and Matter: through Physics to Future Emerging Technologies", Yerevan - Tsaghkadzor, Armenia, 2014, book of abstracts, p.17.
7. **L. Chakhmakhchyan**, *"PageRank opinion formation models on Ulam networks"*, Summer School on Network Analysis and Applications, Luchon, France, 2014, available at <http://www.quantware.ups-tlse.fr/ecoleluchon2014/program.html>.
8. **L. Chakhmakhchyan**, S. Guérin, J. Nunn, A. Datta, *"Compact continuous-variable entanglement distillation using realistic quantum memories"*, 21st Central European Workshop on Quantum Optics – CEWQO 2014, Brussels, Belgium, 2014, book of abstracts, p.165.
9. **L. Chakhmakhchyan**, D. Shepelyansky, *"PageRank voter models on complex Ulam networks"*, 39th Conference of the Middle European Cooperation in Statistical Physics – MECO39, Coventry, UK, 2014, book of abstracts, p.56.
10. **L. Chakhmakhchyan**, S. Guérin, C. Leroy, *"Solvable model for ultrastrong QED regime"*, IOTA Workshop on Cold Molecular Ions, Arosa, Switzerland, 2013, book of abstracts, p.19.

11. **L. Chakhmakhchyan**, N. Ananikian, S. Guérin, C. Leroy, "*Superstable cycles of antiferromagnetic Potts and Ising models on recursive lattices*", 38th Conference of the Middle European Cooperation in Statistical Physics – MECO38, ICTP, Trieste, Italy 2013, list of poster presentations, p.1.
12. **L. Chakhmakhchyan**, A. Datta, J. Nunn, "*A realistic quantum entanglement distillery*", Laser Physics 2013, Ashtarak, Armenia, book of abstracts, p.2.
13. **L. Chakhmakhchyan**, "*Entanglement properties of a spin-1/2 Ising-Heisenberg diamond chain*", Control of Quantum Dynamics of Atoms, Molecules and Ensembles by Light – CAMEL9, Nessebar, Bulgaria, 2013, book of abstracts, p.2.
14. **L. Chakhmakhchyan**, "*Magnetic properties and entanglement of a spin-1/2 diamond chain*", XIV<sup>ème</sup> Journées de l'Ecole Doctorale Carnot-Pasteur, Dijon, France, 2013, book of abstracts, p.5.
15. **L. Chakhmakhchyan**, S. Guérin, C. Leroy, N. Ananikian, "*Entanglement and thermodynamic properties of three coupled atoms*", Laser Physics 2012, Ashtarak, Armenia, book of abstracts, p.12.
16. **L. Chakhmakhchyan**, G. Grigoryan, C. Leroy, Y. Pashayan-Leroy, S. Guérin, H. R. Jauslin, "*Influence of unequal oscillator strengths on stimulated Raman Adiabatic Passage through bright state*", Laser Physics 2011, Ashtarak, Armenia, book of abstracts, p.63.
17. **L. Chakhmakhchyan**, "*Thermal entanglement of the spin-1/2 diamond chain*", The VII<sup>th</sup> International Conference Quantum Theory and Symmetries, Prague, Czech Republic 2011, book of abstracts, p.9.
18. N. S. Ananikyan, L. N. Ananikian, **L. Chakhmakhchyan**, A. N. Kocharyan, "*Thermal entanglement and critical behavior of magnetic properties on a triangulated Kagome lattice*", The XIX<sup>th</sup> International Colloquium on Integrable Systems and Quantum symmetries, Prague, Czechia, 2010, book of abstracts, p.3
19. **L. Chakhmakhchyan**, N. S. Ananikian, L. N. Ananikian, A. N. Kocharyan, "*Common features of magnetic properties and thermal entanglement on a triangulated Kagome lattice*", Workshop on Principles and Design of Strongly Correlated Electronic Systems, Miramare-Trieste, Italy, 2010, book of abstracts, p.71.
20. **L. Chakhmakhchyan**, N. S. Ananikian, L. N. Ananikian, "*Chaotic behavior of the Q-state Potts model on a recursive lattice:  $Q < 2$* ", Pseudochaos and Stable-Chaos in Statistical Mechanics and Quantum Physics, Miramare - Trieste, Italy 2009, book of abstracts, p.29.

- **LANGUAGE SKILLS**

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Armenian: native  
 English: fluent  
 French: proficient  
 Russian: fluent

- **HOBBY**

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Reading books  
 Likes music, cinema, theater  
 Likes/plays tennis and badminton