Quentin Glorieux

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Researcher ID : K-4875-2012

Overview

Associate Professor, IUF Junior Fellow, Quantum Optics and Quantum Technologies experiments.

Current and past positions

IUF Junior Fellow 2018–2023
Institut Universitaire de France

Associate Professor of Physics 2013–
Sorbonne University, Paris

- Quantum Optics Research: fluids of light in exciton-polariton systems and warm atomic media, superfluidity, quantum simulation using atomic-based quantum memories
- Photonic Quantum Technologies Research: interactions between nano-emitters (SiV nanodiamonds, perovskite nanocrystals, colloidal quantum dots) and nanowaveguides (tappered fibers)
- Teaching: Quantum Mechanics, Optics, Experimental Physics, and Scientific Computing

Marie-Curie Postdoctoral Fellow 2010-2013
National Institute of Standards and Technologies – NIST, Gaithersburg

- Laser Cooling & Trapping group of Prof. William D. Phillips and Paul D. Lett: research on four-wave mixing, atomic vapor photonic memory and quantum information in dispersive media

Invited Postdoctoral Fellow (6 months) 2012
National Australian University – ANU, Canberra.

- Quantum Optics group of Prof. Ping Koy Lam: research on quantum memory in cold atomic clouds

Education

Habilitation 2018
Sorbonne Université, France
Quantum Optics in Dense Atomic Media. From Optical Memories to Fluid of Light.

PhD in Physics 2007-2010
Université Paris Diderot, France.
Theory and Experiments on multimode entanglement using Four-Wave-Mixing in a hot atomic vapor
Thesis advisor: Prof. Thomas Coudreau. Laboratoire Matériaux et Phénomènes Quantiques

Master in Optics and Photonics 2009-2010
Ecole Polytechnique & Institut d'Optique, France
Academic/Research at ICFO - Prof. Juergen Eschner Group - Spain

Engineer Degree in Optics 2003-2007
Institut d'Optique – Graduate School, France

PENDING MANUSCRIPTS [ARXIV]

33. G. Blanquer, V. Loo, M. Joos, **Q. Glorieux**, Y. De Wilde, V. Krachmalnicoff. Imaging light scattered by a subwavelength nanofiber, from near field to far field, arXiv:1811.09109 (2018)

32. Q. Fontaine, T. Bienaime, S. Pigeon, E. Giacobino, A. Bramati, **Q. Glorieux**. Comparison between phase velocity and group velocity for elementary excitations in a fluid of light, in preparation, (2019)

31. C. Ding, V. Loo, M. Joos, **Q. Glorieux**. Loop and knot resonators using a tapered nanofiber, in preparation, (2019)

30. H. Hu, Q. Fontaine, T. Bienaime, A. Bramati, **Q. Glorieux**. Compensation of the linear absorption for non diffracting Bessel beams in preparation, (2019)

29. M. Joos, A. Bramati, **Q. Glorieux**. Full polarisation control in a tapered optical nanofiber, in preparation, (2019)

28. R. Bodeda, S. Pigeon, **Q. Glorieux**, A. Bramati. Generating strong anti-bunching using coherent states in preparation, (2019)

PEER-REVIEWED JOURNAL PAPERS [STATISTICS][ARXIV]

27. Q. Fontaine, T. Bienaime, S. Pigeon, E. Giacobino, A. Bramati, **Q. Glorieux**. Observation of the Bogoliubov dispersion in a fluid of light, Phys. Rev. Lett. - Editors' Suggestion, **121**, 183604 , (2018).

26. M. Joos, C. Ding, V. Loo, G. Blanquer, E. Giacobino, A. Bramati, V. Krachmalnicoff, **Q. Glorieux**. Polarization Control of Linear Dipole Radiation Using an Optical Nanofiber. Physical Review Applied, **9**, 064035 (2018).

25. M. Manceau, S. Vezzoli, **Q. Glorieux**, E. Giacobino L. Carbone, M. De Vittorio J-P. Hermier, A. Bramati. CdSe/CdS dot–in–rods nanocrystals fast blinking dynamics. ChemPhysChem, **19**, 1. (2018).

24. T. Boulier, E. Cancellieri, N. D Sangouard, R. Hivet, **Q. Glorieux**, E. Giacobino, A. Bramati. Lattices of quantized vortices in polariton superfluids. Comptes Rendus Académie des Sciences. Comptes Rendus Physique **17**, 893 (2016).

23. T. Boulier, E. Cancellieri, N. D. Sangouard, **Q. Glorieux**, A. V. Kavokin, D. M. Whittaker, E. Giacobino, and A. Bramati. Injection of Orbital Angular Momentum and Storage of Quantized Vortices in Polariton Superfluids. Phys. Rev. Lett. **116**, 116402 (2016).

22. W. Geng, M. Manceau, N, Rahbany, V. Sallet, M. De Vittorio, L. Carbone, **Q. Glorieux**, A. Bramati, C. Couteau. Localised excitation of a single photon source by a nanowaveguide. Scientific Reports **6**, 19721 (2016).

21. S. Vezzoli, M. Manceau, G. Leménager, **Q. Glorieux**, E. Giacobino, L. Carbone, M. De Vittorio, A. Bramati. Exciton Fine Structure of CdSe/CdS Nanocrystals Determined by Polarization Microscopy at Room Temperature. ACS Nano **9**, 7992 (2015).

20. T. Boulier, H. Tercas, DD. Solnyshkov, **Q. Glorieux**, E. Giacobino, G. Malpuech, A. Bramati. Vortex chain in a resonantly pumped polariton superfluid. Scientific Reports **5**, 9230 (2015).

19. J.B. Clark, R.T. Glasser, **Q. Glorieux**, U. Vogl, T. Li, K.M. Jones, and P.D. Lett. Quantum mutual information of an entangled state propagating through a fast-light medium. Nature Photonics **8**, 515 (2014).

18. M. Manceau, S. Vezzoli, **Q. Glorieux**, F. Pisanello, E. Giacobino, L. Carbone, M. De Vittorio, A. Bramati. Effect of charging on CdSe/CdS dot-in-rods single-photon emission. Phys. Rev. B **90**, 035311 (2014).

17. U. Vogl, R. T Glasser, J. B Clark, **Q. Glorieux**, T. Li, N. V Corzo, P. D Lett. Advanced quantum noise correlations. New Journal of Physics, **16**, 013011 (2014).

16. NV. Corzo, **Q. Glorieux**, AM. Marino, JB. Clark, RT. Glasser, PD. Lett. Rotation of the noise ellipse for squeezed vacuum light generated via four-wave mixing. Physical Review A **88**, 043836 (2013).

15. B.M. Sparkes, J. Bernu, M. Hosseini, J. Geng, **Q. Glorieux**, P.A. Altin, P.K. Lam, N.P. Robins, B.C. Buchler. Gradient echo memory in an ultra-high optical depth cold atomic ensemble. New Journal of Physics **15**, 085027 (2013).

14. JB. Clark, **Q. Glorieux**, PD. Lett. Spatially addressable readout and erasure of an image in a gradient echo memory. New Journal of Physics **15**, 035005 (2013).

13. U. Vogl, RT. Glasser, **Q. Glorieux**, JB. Clark, NV. Corzo, PD. Lett. Experimental characterization of Gaussian quantum discord generated by four-wave mixing. Physical Review A **87**, 010101 (2013).

12. BM. Sparkes, J. Bernu, M. Hosseini, J. Geng, **Q. Glorieux**, PA. Altin, PK. Lam, NP. Robins, BC. Buchler. An ultra-high optical depth cold atomic ensemble for quantum memories. Journal of Physics, **467** 012009 (2013).

11. **Q. Glorieux**, JB. Clark, NV. Corzo, PD. Lett. Generation of pulsed bipartite entanglement using four-wave mixing. New Journal of Physics **14**, 123024 (2012).

10. AM. Marino, JB. Clark, **Q. Glorieux**, PD. Lett. Extracting spatial information from noise measurements of multi-spatial-mode quantum states. European Physical Journal D **66**, 1 (2012).

9. **Q. Glorieux**, J.B. Clark, A.M. Marino, Z. Zhou, P D. Lett, Temporally multiplexed storage of images in a gradient echo memory. Optics Express **20**, 12350 (2012).

8. JB. Clark, Z. Zhou, **Q. Glorieux**, AM. Marino, PD. Lett. Imaging using quantum noise properties of light. Optics Express **20**, 17050 (2012).

7. **Q. Glorieux**, L. Guidoni, S. Guibal, JP. Likforman, T. Coudreau. Quantum correlations by four-wave mixing in an atomic vapor in a nonamplifying regime: Quantum beam splitter for photons. Physical Review A 84, 053826 (2011).

6. IH. Agha, C. Giarmatzi, **Q. Glorieux**, T. Coudreau, P. Grangier, G. Messin. Time-resolved detection of relative-intensity squeezed nanosecond pulses in an ^{87}Rb vapor. New Journal of Physics **13**, 043030 (2011).

5. **Q. Glorieux**, R. Dubessy, S. Guibal, L. Guidoni, J.-P. Likforman, T. Coudreau, and E. Arimondo, Double-Λ microscopic model for entangled light generation by four-wave mixing. Phys. Rev. A **82**, 033819 (2010).

4. **Q. Glorieux**, T. Coudreau, L. Guidoni, JP. Likforman. Strong quantum correlations in four wave mixing in ^{85}Rb vapor. Proc. of SPIE **7727**, 772703 (2010).

3. S. Removille, R. Dubessy, **Q. Glorieux**, S. Guibal, T. Coudreau, L. Guidoni, JP. Likforman. Photoionisation loading of large Sr^+ ion clouds with ultrafast pulses. Applied Physics B **97** , 47 (2009).

2. S. Removille, R. Dubessy, B. Dubost, **Q. Glorieux**, T. Coudreau, S. Guibal, JP. Likforman, L. Guidoni. Trapping and cooling of Sr+ ions: strings and large clouds. Journal of Physics B **42**, 154014 (2009).

1. V. Detalle, **Q. Glorieux**, R. Bruder, D. L'Hermite, A. Semerok. Laser induced breakdown spectroscopy (LIBS): a new analytical technique for in situ study of painted artworks. Actualites Chimiques, **98**, 104 (2007).

Dissemination articles

5. Et la lumière devint liquide. Sciences et Vie (Octobre 2017)

4. Rush a light wave and you'll break its data, say scientists. Science Daily (2014).

3. Physicists store short movie in a cloud of gas. MIT Technology Review (2012).

2. Short movies stored in an atomic vapor. Science Daily (2012).

1. Storing a short movie in an atomic vapor. SPIE NewsRoom (2012).

Funding [≈ 1.9M€ over 5 years including 1M€ as PI or coordinator]

- Institut Universitaire de France (IUF) Junior Fellowship, "Q-Flame - Quantum Fluids of Light in dilute Atomic Media", 255,000€, PI, (2018 - 2023).
- Emergences Ville de Paris, "Nano^2 - Nanocrystals in nanofiber Fabry-Perot cavities", 238,000€, PI, (2014 - 2018).
- Ile de France Research program , "COSINE - Controlled Nanopositioning of Single Emitters in nanostructured environments", 121,000€, co-PI, (2015 - 2017).
- European Quantum Technologies Flagship - Quantera, "PhoQuS - Photons for Quantum Simulation", 300,000€, co-Investigator and WP leader, (2018 - 2020).
- Agence Nationale de la Recherche (ANR) - Accueil Chercheur de Haut Niveau, "C-FLight – Correlated fluid of light : hydrodynamical and thermodynamical aspects", 400,000€, Coordinator, (2015 - 2019).
- Agence Nationale de la Recherche (ANR) - Projet collaboratif, "UNIQ – Unconventional Integrated nanophotonic sources with Quantum correlations", 155,000€, Partner, (2016 - 2020).
- Agence Nationale de la Recherche (ANR) - Projet collaboratif, "TeraMicroCav – Génération de rayonnement Téra-Hertz dans des microcavités semiconductrices", 168,000€, Partner, (2016 - 2020).
- Agence Nationale de la Recherche (ANR) - Projet collaboratif, "QFL - Quantum Fluids of Light", 237,000€, Partner, (2016 - 2020).

Invited Talks at International Conferences

9. JMC 2018 - Condensed matter and cosmology, Grenoble, France, 08/18
8. Quantum Fluid of Light and Matter QFLM18, Les Houches, France, 06/18
7. Condensates of Light, Bad Honnef, Germany, 01/18
6. School on Nano and Quantum Optics, Les Houches, France, 10/17
5. Universal Aspects of Quantum Turbulence, Nice, France, 10/17
4. Fluid of Light international workshop, Edinburgh, UK, 10/16
3. Photonics West, San Franciso, USA, 02/15
2. ICCS14, Hong Kong, China, 12/14
1. OSA International Conference on Quantum Information ICQI 11, Ottawa, 06/11

Seminars and Colloquia

19. University of Vienna, CoQuS Colloquium, Austria, 11/18
18. Université Nice Cote d'Azur, InPhyNi, France, 04/18
17. East China Normal University, Shangai, China, 12/17
16. Mairie de Paris, Emergences seminar, Paris, France, 05/17
15. Herriot Watt University – Daniele Faccio group, Edinburgh, UK, 04/17
14. Niels Bohr Institutet - Københavns Universitet, Peter Lodahl group, 03/17
13. Herriot Watt University – Daniele Faccio group, Edinburgh, UK, 11/16
12. Stanford University, Jelena Vuckovic group, CA, USA, 02/15
11. INO-CNR BEC Center, Trento, Italy, 01/15
10. East China Normal University, Shangai, China, 12/14
9. University of Science and Technology, Heifei, China, 12/14
8. Université Technologique de Troyes, UTT, Troyes, France, 04/14
7. Ecole Normale Supérieure Seminar, France, 10/13
6. Université de Genève, Nicolas Gisin group, Switzerland, 05/12
5. Australian National University - Physics department, Canberra, Australia, 05/12
4. Harvard University, Mikhail Lukin group, Boston, USA, 08/10
3. MIT, Vladan Vuletic group, Boston, USA, 08/10
2. Caltech, Jeff Kimble group, Pasadena, USA, 08/10
1. NIST-JQI, Bill Phillips group, Gaithersburg, USA, 07/10

Teaching

- 2018. **Main Online Instructor** for Quantum Mechanics course in the Virtual Exchange Program.
- Since 2013. **Teaching at the Physics Department of Sorbonne University**.
  192h of lectures per year.
  Undergraduate lectures in **Quantum Mechanics**, Wave Physics, Scientific computing.
  Undergraduate laboratory courses in **Optics**, Thermodynamics, Electronics.
  Graduate lectures in **Quantum Optics** and **Lasers**.
  Advisor for students who are half-time studying and half-time working as apprentice.
  Supervisor of the Quantum Mechanics class for undergraduate students (200 students).
- Since 2017. **Member of the academic council** in charge of the allocation of resources for teaching (number of hours, fundings, ECTS).
- 2012. **Online Instructor** to a Massive Online Open Course (MOOC) on Coursera.org : "Exploring Quantum Physics" under the supervision of V. Galitski and Charles Clark.
- 2007-2010. **Teaching Assistant** : 64h per year - Tutorials of Mathematics for biologists and physicians at Université Paris Nord.

PhD and Master theses Supervision

11. Mathieu Manceau – PhD 2014 – Co-supervision "Single CdSe/CdS dot-in-rods fluorescence properties." *UPMC*
10. Thomas Boulier – PhD 2014 – Co-supervision, "Controlled vortex lattices and non-classical light with microcavity polaritons." *UPMC*
9. Maxime Joos – PhD 2018, "Tailoring the properties of nanoemitters using tapered nanofibers." *Sorbonne University*
8. Quentin Fontaine – PhD (graduation in 2019), "Superfluidity of light in a warm atomic vapor." *Sorbonne University*
7. Murad Abuzarli – PhD (graduation in 2021), "Photonic quantum simulations in quantum memories." *Sorbonne University*

6. Salma Aziam – Master 2014, "Etude du couplage de nanocristaux à une fibre optique étirée." *UPMC*
5. Nicolas D. Sangouard – Master 2014, "Propriétés quantiques de la lumière émise par des polaritons dans un micropilier semiconducteur excité hors résonance." *ENS Cachan*
4. Pauline Boucher – Master 2015, "Superfluidity of light." *Ecole Polytechnique*
3. Peyuan He – Master 2015, "Fabrication of microfiber knots and tips." *UPMC*
2. Stefano Pierini – Master 2016 – Co-supervision "Experimental study of superfluidity effects in quantum fluids of light." *Universita de Firenze*
1. Agostino Apra – Master 2017, "Superfluidity of light in a nonlinear atomic medium." *Sapienza, Universita di Roma*

Fellowships and Awards

- 2018 – IUF Junior Fellow
- 2016 – Invited Associate Professor at East China National University, Shangai (1 month).
- 2014 – Paris Young scientist "Emergences" award for starting an independent research team.
- 2011 – Marie Curie IOF Postdoctoral fellowship (3 years).
- 2010 – NIST–JQI International Postdoctoral fellowship (2 years).

Comissions of trust

- 2018 – **Scientific Evaluator** for the Marie Curie European fellowship program.
- 2017 – **Scientific Evaluator** for the ANR, french national funding agency.
- 2014 – **Scientific Evaluator** for the Caixa fellowship program.
- 2016 – **Scientific Evaluator** for the Grenoble University - AGIR funding program.
- 2010 – **Session Chair** at Photonics West 2015. Quantum Sensing and Photonic Devices.
- Since 2010 – **Reviewer** for Nature Physics, Nature Communications, Phys. Rev. Lett., Phys. Rev. A, Phys. Rev. B, Optics Express, Optica, EPJD, New Journal of Physics, Optics Letters, Scientific Reports, Applied Physics B, Applied Physics Letters.

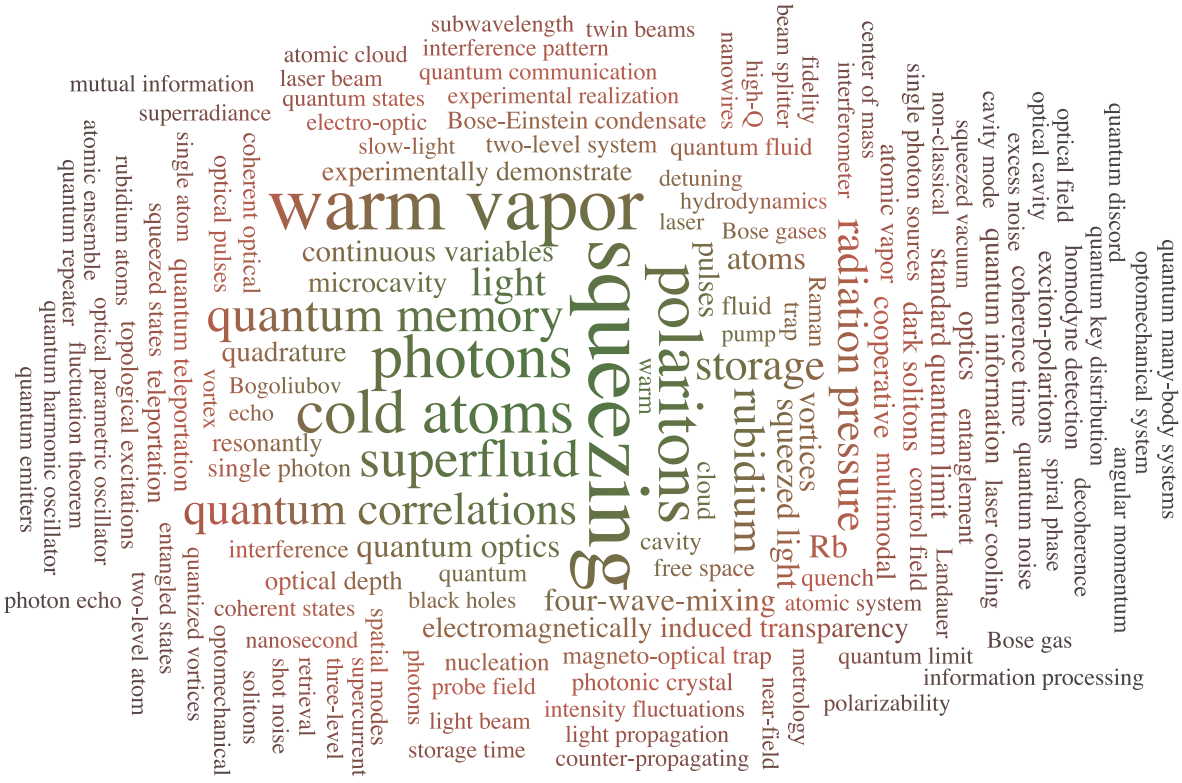
Organization of scientific meeting

- 2019 – **Organizer** of a Scientific School in Les Houches, France on Light-matter interaction 12 invited lecturers - 80 participants - 6 days.
- 2018 – **Organizer** of a Scientific School in Les Houches on Nano & Quantum Optics. 20 invited lecturers - 80 participants - 11 days.
- 2017 – **Member of program committee** for QCMC 2018 - Baton Rouge, USA.
- 2016 – **Member of the organizing committee** of the CNRS Physics days at Agay, France. 100 participants - 3 days.
- 2016 – **Co-Organizer** of the ANR Quandyde workshop on Quantum Fluids of Light at Sorbonne University, Paris. 30 participants - 2 days.
- 2010 – **Member of the organizing committee** of the LKB Scientific days at Chales, France. 150 participants - 3 days.

Institutional Responsibilities

- 2018 · Today – **Elected member** at the Science faculty board of Sorbonne University.
- 2016 · Today – **Supervisor** of the international mobility program for Master students at the Sorbonne Physics Department.
- 2014 · 2018 – **Board member** of the Laboratory Kastler Brossel executive and scientific committee.
- 2014 · 2019 – **Elected member** of the national CNU committee (Conseil National des Universités) - Atomic Physics Optics division.
- 2008 · 2010 - **Elected student member** of the Université Paris Diderot scientific committee.
- Since 2013 – **Member** of the LKB Dissemination and Outreach committee, organizer of the Quantum Optics internal seminar, co-organizer of Fete de la Science : a national general public event with lab visits and scientific hands-on demonstrations.

Scientific Interests



Most commonly used words in articles available on Arxiv co-signed by Quentin Glorieux.