

Curriculum Vitae

Dr. Syamsundar De

Assistant Professor
Advanced Technology
Development Centre (ATDC)
IIT Kharagpur

Contact Details

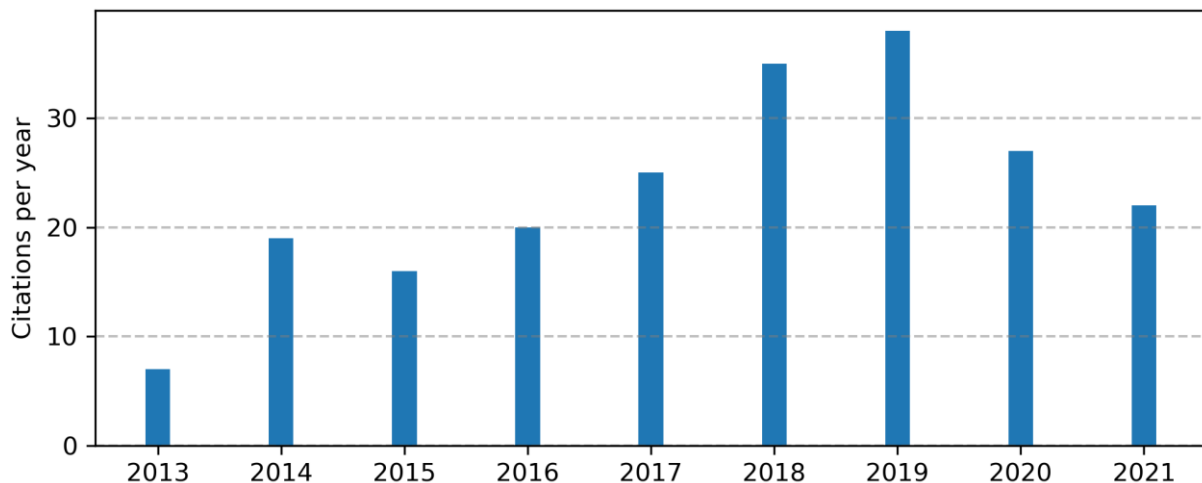
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Personal Information

Citizenship: Indian
Date (place) of birth: March 25, 1987 (Dhanespur, West Bengal, India)
Gender: Male
Marital status: Married

Track Records¹

Citations: 218
h-index: 8
Publications: 22 papers (20 published, 1 accepted, 2 under review)
22 conference presentations (4 invited, 18 contributed)



¹ Metrics according to Google Scholar (December 23, 2021)

url: <https://scholar.google.com/citations?user=SqPNpLoAAAAJ&hl=en>

Education

Oct. 2012
— Jun. 2015

Doctor of Philosophy (PhD), Physics

Laboratoire Aimé Cotton, **Université Paris-Saclay**, France

Supervisor: Fabien Bretenaker and Rupamanjari Ghosh (cosupervisor)

Thesis: “Noise in dual-frequency semiconductor and solid-state lasers.”

Designed, built and characterized various dual-frequency lasers (Nd:YAG, VECSEL) for microwave-photonics applications. Experimental and theoretical analysis of noises and laser dynamics leading to efficient noise mitigation strategies.

Award: Best thesis award (Prix de these) from Université Paris-Saclay

Sep. 2010
— Jul. 2012

Master of Science (MSc), Optics, Matter, and Plasma

Ecole Polytechnique and **Institut d’Optique Graduate School**, France

Core competencies: Quantum optics, laser physics, light-matter interaction, wave optics, statistical optics, nonlinear optics, optics lab, nanophotonics, advanced photonics, near-field microscopy, optics in complex media, statistical physics, atomic and molecular physics, semiconductor physics.

Sep. 2007
— Jul. 2010

Bachelor of Technology (BTech), Radiophysics and Electronics

University of Calcutta, India

Core competencies: Electromagnetic fields and waves, guided waves, semiconductor and solid-state physics and devices, optical and microwave communication, signal processing, analog and digital electronics, analytical and numerical methods, linear programming.

Sep. 2004
— Jul. 2007

Bachelor of Science (BSc), Physics (Honours), Chemistry and Mathematics

Presidency College, University of Calcutta, India

Core competencies: Quantum mechanics, classical mechanics, statistical physics, mathematical physics, electromagnetism, geometrical and physical optics, lasers, atomic and molecular physics, electronics.

Positions

Dec. 2021
(Current position)

Assistant Professor

Advanced Technology Development Centre

Indian Institute of Technology (IIT) Kharagpur

Roles: Principal investigator of research activities on the development of photonic quantum technologies at ultrafast time scales and with ultra-large optical bandwidth at **Photonic Quantum Systems (PhoQuS)** lab.

Dec. 2018
— Nov. 2021

Postdoc (Postdoctoral Research Assistant)

Integrated Quantum Optics, **Christine Silberhorn**

Department of Physics, **Universität Paderborn**

Roles: Leading the quantum network related experiments, day-to-day supervision of students, teaching, software preparation, theoretical modelling, writing proposals, establishing collaborations, writing articles, presenting results in conferences, seminars, and project meetings.

Oct. 2015
— Nov. 2018

Postdoc (Postdoctoral Research Assistant)

Multimode Quantum Optics, **Nicolas Treps** and **Claude Fabre**
Laboratoire Kastler Brossel, **Sorbonne Université**

Roles: Setting up an ultrafast quantum optics experiment from scratch, preparing software for data recordings and automatization of experiment, theoretical modelling, day-to-day supervision of students, participating in project meetings with collaborators, article writings, presenting results in conferences and seminars.

Research Guidance

Co-supervised (day-to-day supervision): 2 PhD, 4 MSc, and 1 BSc students. Currently co-supervising 2 PhD, 1 MSc, and 1 BSc students.

Teaching

- Quantum information theory, summer semester 2021 (MSc), Paderborn University.
- Quantum information theory, summer semester 2020 (MSc), Paderborn University.
- Quantum information and communication, summer semester 2019 (MSc), Paderborn University.

Additional Experiences

Reviewer	Physical Review Letters, Physical Review A, Optics Letter, Optics Express, and European Physical Journal Plus
Conference organization	Local organizer of the Central European Workshop on Quantum Optics (CEWQO, 2019 in Paderborn) and Quantum Information and Measurement (QIM, 2018 in Paris)
Visiting scientist	Initiated a laser parameter estimation experiment at NIST Boulder, Colorado, USA (Franklyn Quinlan)

Awards and Recognitions

- **Recognition of research proposal:** Marie Skłodowska-Curie Actions Seal of Excellence from European Commission (2019).
- **Postdoctoral fellowship:** Paderborn University, Germany (2018)
- **Postdoctoral fellowship:** Sorbonne Université, France (2017)
- **Postdoctoral fellowship:** CNRS, France (2015)
- **Best thesis award:** Doctoral school (EDOM) of Université Paris-Saclay (2015)
- **PhD student recognition:** Selected presenter from Laboratoire Aime Cotton in ‘Colloque Jeunes Chercheurs Alain Bouyssy’ (2014).
- **PhD fellowship:** Doctoral school (EDOM) of Université Paris-Saclay (2012)
- **Masters’ Scholarship:** Ecole Polytechnique, Fondation de l’X (2011)
- **Masters’ Scholarship:** Thales-French Ministry of External Affairs (2010)
- **Invited speaker in distinguished conferences:**
 - Quantum walks and quantum simulation, Marseille, France (2020)
 - Central European Workshop on Quantum Optics, Paderborn, Germany (2019)
 - International Conference on Quantum Optics and Quantum Information, Minsk, Belarus (2019)
 - Photonics North, Montreal, Canada (2018)

Publication Details

Peer-reviewed journals

1. J. Gil-Lopez, Y. S. Teo, **S. De**, B. Brecht, H. Jeong, L. L. Sánchez-Soto, and C. Silberhorn, Universal compressive tomography in the time-frequency domain
Optica **8**, 1296 (2021)
doi.org/10.1364/OPTICA.427645
[arXiv:2105.12462](https://arxiv.org/abs/2105.12462)
2. M. Ansquer, V. Thiel, **S. De**, B. Argence, G. Gredat, F. Bretenaker, N. Treps
Unveiling the dynamics of optical frequency combs from phase-amplitude noise correlations
Phys. Rev. Research **3**, 033092 (2021)
[doi:10.1103/PhysRevResearch.3.033092](https://doi.org/10.1103/PhysRevResearch.3.033092)
[arXiv:1806.02198](https://arxiv.org/abs/1806.02198)
3. **S. De**, J. Gil-Lopez, B. Brecht, C. Silberhorn, L. L. Sánchez-Soto, Z. Hradil, and J. Řeháček
Effects of coherence on temporal resolution
Phys. Rev. Research **3**, 033082 (2021)
[doi:10.1103/PhysRevResearch.3.033082](https://doi.org/10.1103/PhysRevResearch.3.033082)
[arXiv:2103.10833](https://arxiv.org/abs/2103.10833)
4. D. Bagrets, K. W. Kim, S. Barkhofen, **S. De**, J. Sperling, C. Silberhorn, A. Altland, and T. Micklitz
Probing the topological Anderson transition with quantum walks
Phys. Rev. Research **3**, 023183 (2021).
[doi:10.1103/PhysRevResearch.3.023183](https://doi.org/10.1103/PhysRevResearch.3.023183)
[arXiv:2102.01176](https://arxiv.org/abs/2102.01176)
5. N. Prasannan, **S. De**, S. Barkhofen, B. Brecht, J. Sperling, and C. Silberhorn
Experimental entanglement characterization of two-qubit states
Phys. Rev. A **103**, L040402 (2021).
[doi:10.1103/PhysRevA.103.L040402](https://doi.org/10.1103/PhysRevA.103.L040402)
[arXiv:2102.01450](https://arxiv.org/abs/2102.01450)
6. A. Gherardi*, **S. De***, A. Laneve, S. Barkhofen, J. Sperling, P. Mataloni, and C. Silberhorn
Transient subdiffusion via disordered quantum walks
Phys. Rev. Research **3**, 023052 (2021) (Equal contribution).
[doi:10.1103/PhysRevResearch.3.023052](https://doi.org/10.1103/PhysRevResearch.3.023052)
[arXiv:2007.12526](https://arxiv.org/abs/2007.12526)
7. L. La Volpe, **S. De**, M. I. Kolobov, V. Parigi, C. Fabre, and N. Treps, and D. B. Horoshko
Spatiotemporal entanglement in a noncollinear optical parametric amplifier
Phys. Rev. Applied **15**, 024016 (2021) (Editor's suggestion)
[doi:10.1103/PhysRevApplied.15.024016](https://doi.org/10.1103/PhysRevApplied.15.024016)
[arXiv:2009.10511](https://arxiv.org/abs/2009.10511)
8. T. Nitsche, **S. De**, S. Barkhofen, E. Meyer-Scott, J. Tiedau, J. Sperling, A. Gábris, I. Jex, and C. Silberhorn
Local versus Global Two-Photon Interference in Quantum Networks
Phys. Rev. Lett. **125**, 213604 (2020)
[doi:10.1103/PhysRevLett.125.213604](https://doi.org/10.1103/PhysRevLett.125.213604)
[arXiv:2005.07219](https://arxiv.org/abs/2005.07219)

9. M. Engelkemeier, L. Lorz, **S. De**, B. Brecht, I. Dhand, M. B. Plenio, C. Silberhorn, and J. Sperling
Quantum photonics with active feedback loops
Phys. Rev. A **102**, 023712 (2020)
[doi:10.1103/PhysRevA.102.023712](https://doi.org/10.1103/PhysRevA.102.023712)
[arXiv:2002.08154](https://arxiv.org/abs/2002.08154)
10. A. Smirne, T. Nitsche, D. Egloff, S. Barkhofen, **S. De**, I. Dhand, C. Silberhorn, S. F. Huelga, and M. B. Plenio
Experimental Control of the Degree of Non-Classicality via Quantum Coherence
Quant. Sci. Technol. **5**, 04LT01 (2020)
[doi:10.1088/2058-9565/aba039](https://doi.org/10.1088/2058-9565/aba039)
[arXiv:1910.11830](https://arxiv.org/abs/1910.11830)
11. L. La Volpe*, **S. De***, T. Kouadou, D. Horoshko, M. Kolobov, C. Fabre, V. Parigi, and N. Treps
Multimode single-pass spatio-temporal squeezing
Opt. Exp. **28**, 12385 (2020) (Equal contribution)
[doi:10.1364/OptExp.28.12385](https://doi.org/10.1364/OptExp.28.12385)
[arXiv:2001.03972](https://arxiv.org/abs/2001.03972)
12. **S. De**, V. Thiel, J. Roslund, C. Fabre, and N. Treps
Modal analysis for noise characterization and propagation in a femtosecond oscillator
Opt. Lett. **44**, 3992 (2019)
[doi:10.1364/OptLett.44.3992](https://doi.org/10.1364/OptLett.44.3992)
[arXiv:1905.01843](https://arxiv.org/abs/1905.01843)
13. H. Lui, G. Gredat, **S. De**, I. Fsaifes, A. Ly, R. Vatre, G. Baili, S. Bouchoule, F. Goldfarb, and F. Bretenaker
Ultra-low noise dual-frequency VECSEL at telecom wavelength using fully correlated pumping
Opt. Lett. **43**, 1794 (2018)
[doi:10.1364/OptLett.43.1794](https://doi.org/10.1364/OptLett.43.1794)
[arXiv:1812.04192](https://arxiv.org/abs/1812.04192)
14. **S. De**, G. Baili, S. Bouchoule, M. Alouini, and F. Bretenaker
Intensity- and phase-noise correlations in a dual-frequency vertical-external-cavity surface-emitting laser operating at telecom wavelength
Phys. Rev. A **91**, 053828 (2015) (Editor's suggestion)
[doi:10.1103/PhysRevA.91.053828](https://doi.org/10.1103/PhysRevA.91.053828)
[arXiv:1502.05841](https://arxiv.org/abs/1502.05841)
15. **S. De**, G. Baili, M. Alouini, J.-C. Harmand, S. Bouchoule, and F. Bretenaker
Class-A dual-frequency VECSEL at telecom wavelength
Opt. Lett. **39**, 5586 (2014)
[doi:10.1364/OptLett.39.5586](https://doi.org/10.1364/OptLett.39.5586)
[arXiv:1812.04192](https://arxiv.org/abs/1812.04192)
16. **S. De**, V. Potapchuk, and F. Bretenaker
Influence of spin-dependent carrier dynamics on the properties of a dual-frequency vertical-external-cavity surface-emitting laser
Phys. Rev. A **90**, 013841 (2014)
[doi:10.1103/PhysRevA.90.013841](https://doi.org/10.1103/PhysRevA.90.013841)
[arXiv:1311.4657](https://arxiv.org/abs/1311.4657)

17. **S. De**, A. El Amili, I. Fsaifes, G. Pillet, G. Baili, F. Goldfarb, M. Alouini, I. Sagnes, and F. Bretenaker
Phase noise of the radio frequency (RF) beatnote generated by a dual-frequency VECSEL
J. Lightwave Technol. **32**, 1307 (2014)
[doi:10.1109/JLT.32.1307](https://doi.org/10.1109/JLT.32.1307)
[arXiv:1311.3057](https://arxiv.org/abs/1311.3057)
18. **S. De**, G. Loas, A. El Amili, M. Alouini, and F. Bretenaker
Theoretical and experimental analysis of intensity noise correlations in an optically pumped dual-frequency Nd:YAG laser
J. Opt. Soc. Am. B **30**, 2830 (2013)
[doi:10.1364/JOSAB.30.2830](https://doi.org/10.1364/JOSAB.30.2830)
19. **S. De**, V. Pal, A. El Amili, G. Pillet, G. Baili, M. Alouini, I. Sagnes, R. Ghosh, and F. Bretenaker
Intensity noise correlations in a two-frequency VECSEL
Opt. Exp. **21**, 2538 (2013)
[doi:10.1364/OptExp.21.2538](https://doi.org/10.1364/OptExp.21.2538)
20. A. El Amili, G. Loas, **S. De**, S. Schwartz, G. Feugnet, J.-P. Pocholle, F. Bretenaker, and M. Alouini
Experimental demonstration of a dual-frequency laser free from antiphase noise
Opt. Lett. **37**, 4901 (2012)
[doi:10.1364/OL.37.004901](https://doi.org/10.1364/OL.37.004901)
[arXiv:1208.2454](https://arxiv.org/abs/1208.2454)

Preprints under review

21. **S. De**, V. Ansari, J. Sperling, S. Barkhofen, B. Brecht, and C. Silberhorn
Experimental measurement-based quantum walks on hypercubes
(Under review in **Nat. Phys.**).
22. J. Sperling, **S. De**, T. Nitsche, J. Tiedau, S. Barkhofen, B. Brecht, C. Silberhorn
Wave-particle duality revisited: Neither wave nor particle
[arXiv:1907.09836](https://arxiv.org/abs/1907.09836) (To be submitted to **npj Quant. Info.**)

Proceedings

1. **S. De**, A. El Amili, G. Pillet, G. Baili, F. Goldfarb, M. Alouini, I. Sagnes, and F. Bretenaker
Experimental and Theoretical Study of Noise in a Dual-Frequency VECSEL
Proc. SPIE 8966, Vertical External Cavity Surface Emitting Lasers (VECSELs) IV, 89660M (2014)
[doi:10.1117/12.2038934](https://doi.org/10.1117/12.2038934)

Conference Presentations

The following list only contains the items presented by me.

• Invited

1. **S. De**, T. Nitsche, J. Sperling, S. Barkhofen, A. Gábris, E. Meyer-Scott, J. Tiedau, B. Brecht, I. Jex, and C. Silberhorn
What is quantum in a quantum walk
International Conference on Quantum Simulation and Quantum Walks (Marseille, France, 2020).
2. **S. De**, Luca La Volpe, T. Kouadou, Y.-S. Ra, A. Dufour, C. Fabre, N. Treps, and V. Parigi
Quantum frequency comb for quantum complex network
Central European Workshop on Quantum Optics (CEWQO) (Paderborn, Germany, 2019).
3. **S. De**, V. Thiel, J. Roslund, V. Parigi, C. Fabre, and N. Treps
Multi-parameter noise estimation in optical frequency combs with quantum-limited sensitivity
International Conference on Quantum Optics and Quantum Information (ICQOQI) (Minsk, Belarus, 2019).
4. **S. De**, Luca La Volpe, T. Kouadou, Y.-S. Ra, A. Doufour, C. Fabre, N. Treps, and V. Parigi
Quantum multimode resources based on optical frequency combs and implementation of quantum complex network
Photonics North (Montreal, Canada, 2018).

• Contributed

1. **S. De**, D. Bagrets, K. W. Kim, S. Barkhofen, J. Sperling, B. Brecht, A. Altland, T. Micklitz, C. Silberhorn
Topological Anderson Localization Transition in Time-Multiplexed Quantum Walks (Talk)
CLEO/Europe-EQEC (Munich, Germany, 2021).
2. **S. De**, J. Gil-Lopez, B. Brecht, C. Silberhorn, L. L. Sánchez-Soto, Z. Hradil, and J. Řeháček
Temporal Resolution of Partially Coherent Sources (Poster)
CLEO/Europe-EQEC (Munich, Germany, 2021).
3. **S. De**, T. Nitsche, S. Barkhofen, E. Meyer-Scott, J. Tiedau, J. Sperling, A. Gábris, I. Jex, and C. Silberhorn
Driving two-photon interference via classical control in quantum networks (Talk)
Conference on Lasers and Electro-Optics (CLEO) (San Jose, USA, 2021).
4. **S. De**, J. Gil-Lopez, B. Brecht, C. Silberhorn, L. L. Sánchez-Soto, Z. Hradil, and J. Řeháček
Resolving partially coherent ultrafast pulses at the quantum limit (Talk)
Conference on Lasers and Electro-Optics (CLEO) (San Jose, USA, 2021).
5. **S. De**, T. Nitsche, S. Barkhofen, E. Meyer-Scott, J. Tiedau, A. Gábris, I. Jex, and C. Silberhorn
Single- and multi-photon interference using time-multiplexed network (Talk)
DPG Fall Meeting Quantum Science and Information Technologies (Freiburg, Germany, 2019).
6. **S. De**, T. Nitsche, S. Barkhofen, E. Meyer-Scott, J. Tiedau, A. Gábris, I. Jex, and C. Silberhorn
A single-photon source for time-multiplexed network (Poster)
Central European Workshop on Quantum Optics (CEWQO) (Paderborn, Germany, 2019).

7. **S. De**, V. Thiel, J. Roslund, C. Fabre, and N. Treps
Phase-amplitude noise correlations in an optical frequency comb **(Talk)**
CLEO/Europe-EQEC (Munich, Germany, 2017).
8. **S. De**, L. La Volpe, V. Parigi, C. Fabre, and N. Treps
Novel source of multimode squeezed light for quantum enhanced space-time positioning **(Poster)**
BIPM Workshop "The Quantum Revolution in Metrology" (Sèvres, France, 2017).
9. **S. De**, V. Thiel, J. Roslund, and N. Treps
Modal approach towards complete characterization of frequency comb noise **(Talk)**
Conference on Lasers and Electro-Optics (CLEO) (San Jose, USA, 2017).
10. **S. De**, G. Baili, M. Alouini, J.-C. Harmand, S. Bouchoule, and F. Bretenaker
Relaxation Oscillation Free Tunable Dual-Frequency VECSEL at Telecom Wavelength **(Talk)**
International Conference on Fiber Optics and Photonics (Kharagpur, India, 2014).
11. **S. De**, G. Loas, A. El Amili, M. Alouini, and F. Bretenaker
Study of Intensity Noise Correlations in Dual-Frequency Nd:YAG Laser **(Poster)**
International Conference on Fiber Optics and Photonics (Kharagpur, India, 2014).
12. **S. De**, A. El Amili, G. Pillet, G. Baili, I. Sagnes, M. Alouini, and F. Bretenaker
Noise Properties of a Dual-Frequency VECSEL **(Poster)**
School and discussion meeting frontiers in light-matter interactions (Kolkata, India, 2014).
13. **S. De**, A. El Amili, G. Pillet, G. Baili, I. Sagnes, M. Alouini, and F. Bretenaker,
Noise Properties of a Class-A Dual-Frequency VECSEL **(Talk)**
European Semiconductor Laser Workshop (Paris, France, 2014).
14. **S. De**, A. El Amili, G. Pillet, G. Baili, F. Goldfarb, M. Alouini, I. Sagnes, and F. Bretenaker
Experimental and Theoretical Study of Noise in a Dual-Frequency VECSEL **(Talk)**
SPIE Photonics West (San Francisco, USA, 2014).
15. **S. De**, A. El Amili, G. Pillet, G. Baili, I. Sagnes, M. Alouini, F. Bretenaker
RF phase noise of a dual-frequency VECSEL **(Poster)**
Advanced Solid-State Lasers (Paris, France, 2013).
16. **S. De**, A. El Amili, G. Pillet, G. Baili, I. Sagnes, M. Alouini, and F. Bretenaker
Phase Noise of the Radio Frequency Beatnote Generated by a Dual-Frequency VECSEL **(Talk)**
IEEE International Topical Meeting on Microwave Photonics (Virginia, USA, 2013).
17. **S. De**, A. El Amili, G. Loas, S. Schwartz, G. Feugnet, J.-P. Pocholle, F. Bretenaker, and M. Alouini
Intensity Noise Reduction of Dual-Frequency Nd:YAG Lasers **(Talk)**
International Conference on Fiber Optics and Photonics (Chennai, India, 2012).
18. **S. De**, V. Pal, A. El Amili, G. Pillet, G. Baili, M. Alouini, I. Sagnes, R. Ghosh, and F. Bretenaker
Noise Correlations in Dual Frequency VECSEL **(Poster)**
International Conference on Fiber Optics and Photonics (Chennai, India, 2012).

Invited Seminars

- *From classical laser noise to quantum metrology with optical frequency combs*
Max Planck Institute (Host: M. Chekhova, Erlangen, Germany, 2018).
- *Time/frequency mode of light: from classical laser noise to quantum metrology*
Paderborn University (Host: C. Silberhorn Paderborn, Germany, 2018).
- *From classical to quantum metrology with optical frequency combs*
IISER Kolkata (Host: N. Ghosh, Kolkata, India, 2017).
- *Optical frequency combs: From quantum information to quantum metrology*
IIT Delhi (Host: J. Ghosh, Delhi, India, 2017).
- *Modal analysis of noises in optical frequency combs*
IISER Mohali (Host: K. P. Singh, Mohali, India, 2017).
- *Optical frequency combs: From classical to quantum metrology*
Raman Research Institute (Host: R. Philip, Bangalore, India, 2017).
- *From classical to quantum metrology with optical frequency combs*
IIT Madras (Host: B. K. Das, Chennai, India, 2017).
- *Modal analysis of classical and quantum noise in optical frequency combs*
NIST Boulder (Host: F. Quinlan, Colorado, USA).
- *Noise in dual-frequency semiconductor and solid-state lasers*
Sorbonne Université (Host: N. Treps, Paris, France, 2015).
- *Noise in dual-frequency semiconductor and solid-state lasers*
Universität des Saarlandes (Host: J. Eschner, Saarbrücken, Germany, 2015).
- *Noise correlations in dual-frequency VECSEL*
Shiv Nadar University (Host: R. Ghosh, Greater Noida, India, 2013).

Ongoing and Previous Collaborations:

Theory: Martin B. Plenio (Ulm, Germany), Igor Jex (Prague, Czechia), Luis L. Sánchez-Soto (Madrid, Spain), Zdeněk Hradil & Jaroslav Řeháček (Palacký University Olomouc), Alexander Altland (Cologne, Germany), Mikhail I. Kolobov (Lille, France).

Experiment: Christine Silberhorn (Paderborn, Germany), Fabien Bretenaker (Orsay, France), Nicolas Treps & Claude Fabre (Paris, France), Paolo Mataloni (Rome, Italy), Franklyn Quinlan (Boulder, USA), Ghaya Baili (Palaiseau, France), Mehdi Alouini (Rennes, France), Isabelle Sagnes (Orsay, France), Sophie Bouchoule (Orsay, France), Rupamanjari Ghosh (Greater Noida, India) .

Scientific Expertise (Experiment and Theory)

Ultrafast optics: mode-locked lasers, optical parametric oscillators (OPOs), optical frequency combs, synchronous cavity, pulse shaping, coherent controlling, high-stability optical network, high-stability optical delay lines, servo locking of lasers and cavities, etc.

Quantum optics: waveguide single-photon source, bulk and waveguide source of multimode squeezing, entangled source, linear and nonlinear waveguide characterization, single-photon

detectors, homodyne detectors, temporal/spectral multipixel detection, multipixel and pulse-shaped homodyne detection, etc.

Electronics: electrical spectrum analysers, optical spectrum analysers, oscilloscopes, acousto-optic modulators, high-speed electro-optic modulators, multipixel detectors, high-speed homodyne detectors, locking electronics, multi-pixel detectors, time taggers, etc.

Programming languages: python, mathematica, matlab, labview

Scientific/Research Interest

- Ultrafast quantum optics in discrete-variable (DV) and continuous-variable (CV) framework
- High-dimensional quantum network for quantum simulation and quantum computation
- Time-frequency quantum metrology
- Dynamics and noise of continuous-wave (CW) and pulsed lasers