

Yoann Piétri

MAÎTRE DE CONFÉRENCES - ASSOCIATE PROFESSOR

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Research activities

RESEARCH INTERESTS

Continuous-Variable Quantum Key Distribution, Photonic Integrated Circuits for quantum applications, quantum communication infrastructures and networks, quantum cryptography beyond Quantum Key Distribution, overall integration of quantum communication systems, energetics of quantum information, practical security of Quantum Key Distribution.

RESEARCH PROJECTS

Open source software for CV-QKD (2021-2024): programmation of a python software for experimental CV-QKD, including hardware control, advanced signal processing techniques, parameter estimation, secret key rate computation and classical communication. The software is highly modular, hardware-agnostic and has extensive documentation. It has been benchmarked with emulated distances, fiber spool and deployed fiber at metropolitan distances. This was done in the context of the QNSP project and led to the scientific publication [4]. It is now used for investigation of side-channel attacks and free space communications.

Integrated devices for CV-QKD (2021-2024): characterization and usage of a Si integrated receiver performing heterodyne dual-quadrature detection for CV-QKD. Benchmarked with emulated metropolitan distances. Led to the publication of [3]. Characterization of an InP-based phase-diverse dual quadrature receiver. Involved in the project of an InP-based transmitter (see [2]). This was done in the context of the QNSP project. Participated in the design of new integrated devices that are now expected in the QNSP project.

Quantum Communication Infrastructure (2021-2024): installation and characterization of fibers in the Paris region linking 8 nodes (total distance of around 200 km). Benchmark of the infrastructure with commercial QKD systems and implementation of a trusted node experiment with added security. This was part of the ParisRegionQCI and FranceQCI projects. Led to the publication [6].

Energetic Analysis of Quantum Communication Protocols (2024): introduction of two new metrics for estimating the energetic cost of quantum communication protocols (in particular QKD). Application to the case of DV-QKD protocols (BB84, E91, MDI) and CV-QKD (GMCS and DMCS), and extension to CKA protocols leading to the first analysis of this kind. Led to the publication [7].

Experiences and Education

Maître de Conférences (Associate Professor)

SORBONNE UNIVERSITÉ

- Development of novel Quantum Key Distribution protocols

Paris, France

2025–Current

Post-Doctoral Contract

UNIVERSITÀ DEGLI STUDI DI PADOVA

- Experimental Quantum Cryptography
- Integrated Photonics for Quantum Technologies
- Energetic analysis of Quantum Cryptography
- Experimental continuous variables beyond Quantum Key Distribution

Padova, Italy

2025–2025

PhD in Physics

SORBONNE UNIVERSITÉ

- System Integration of High-Performance Continuous-Variable Quantum Key Distribution,
- Supervised by Amine Rhouni and Eleni Diamanti,
- Defended on 09/12/2024 in front of the following Jury:
 - Tobias Gehring, Associate Professor at DTU,
 - Christoph Marquardt, Professor at FAU,
 - Ségolène Olivier, Researcher at CEA,
 - Valentina Parigi, Professor at Sorbonne Université,
 - Amine Rhouni, Research Engineer at CNRS,
 - Eleni Diamanti, Research Director at CNRS.

Paris, France

2021–2024

Msc in Physics

IMPERIAL COLLEGE LONDON

- Title: Quantum Fields and Fundamental Forces,
- Master thesis (title: Quantum Cryptography) supervised by Jonathan Halliwell,
- Master awarded with Distinction on 01/12/2020.

London, United Kingdom

2019-2020

Engineering diploma

CENTRALESUPÉLEC - CURSUS SUPÉLEC

- Third year of specialization replaced by an international Master program,
- Engineering diploma awarded on 09/07/2021.

Metz, France

2017 – 2021

Publications

JOURNAL ARTICLES

- [1] **Yoann Piétri** and Eleni Diamanti. **Mar. 2025**. “Communications sécurisées avec des variables quantiques continues”. In: *Photoniques* 130. Invité, pp. 49–54. DOI: [10.1051/photon/202513049](https://doi.org/10.1051/photon/202513049). URL: <https://doi.org/10.1051/photon/202513049>.
- [2] Jennifer Aldama, Samael Sarmiento, Luis Trigo Vidarte, Sebastian Etcheverry, Ignacio López Grande, Lorenzo Castelvero, Alberto Hinojosa, Tobias Beckerwerth, **Yoann Piétri**, Amine Rhouni, Eleni Diamanti, and Valerio Pruneri. **Feb. 2025**. “Integrated InP-based transmitter for continuous-variable quantum key distribution”. In: *Opt. Express* 33.4, pp. 8139–8149. DOI: [10.1364/OE.550386](https://doi.org/10.1364/OE.550386). URL: <https://opg.optica.org/oe/abstract.cfm?URI=oe-33-4-8139>.
- [3] **Yoann Piétri**, Luis Trigo Vidarte, Matteo Schiavon, Laurent Vivien, Philippe Grangier, Amine Rhouni, and Eleni Diamanti. **Dec. 2024**. “Experimental demonstration of continuous-variable quantum key distribution with a silicon photonics integrated receiver”. In: *Optica Quantum* 2.6, pp. 428–437. DOI: [10.1364/OPTICAQ.534699](https://doi.org/10.1364/OPTICAQ.534699). URL: <https://opg.optica.org/opticaq/abstract.cfm?URI=opticaq-2-6-428>.
- [4] **Yoann Piétri**, Matteo Schiavon, Valentina Marulanda Acosta, Baptiste Gouraud, Luis Trigo Vidarte, Philippe Grangier, Amine Rhouni, and Eleni Diamanti. **Dec. 2024**. “QOSST: A Highly-Modular Open Source Platform for Experimental Continuous-Variable Quantum Key Distribution”. In: *Quantum* 8, p. 1575. ISSN: 2521-327X. DOI: [10.22331/q-2024-12-23-1575](https://doi.org/10.22331/q-2024-12-23-1575). URL: <https://doi.org/10.22331/q-2024-12-23-1575>.

PREPRINTS/UNDER REVIEW

- [5] Andrea Peri, Giulio Gualandi, Tommaso Bertapelle, Mattia Sabatini, Giacomo Corrielli, **Yoann Piétri**, Davide Giacomo Marangon, Giuseppe Vallone, Paolo Villoresi, Roberto Osellame, and Marco Avesani. **June 2025**. *High-Performance Heterodyne Receiver for Quantum Information Processing in a Laser Written Integrated Photonic Platform*. arXiv: [2506.08924 \[quant-ph\]](https://arxiv.org/abs/2506.08924). URL: <https://arxiv.org/abs/2506.08924>.
- [6] **Yoann Piétri**, Pierre-Enguerrand Verdier, Baptiste Lacour, Maxime Gautier, Heming Huang, Thomas Camus, Jean-Sébastien Pegon, Martin Zuber, Jean-Charles Faugère, Matteo Schiavon, Amine Rhouni, Yves Jaouën, Nicolas Fabre, Romain Aléaume, Thomas Rivera, and Eleni Diamanti. **Apr. 2025**. *Quantum Key Distribution with Efficient Post-Quantum Cryptography-Secured Trusted Node on a Quantum Network*. arXiv: [2504.01454 \[quant-ph\]](https://arxiv.org/abs/2504.01454). URL: <https://arxiv.org/abs/2504.01454>.
- [7] Raja Yehia, **Yoann Piétri**, Carlos Pascual-García, Pascal Lefebvre, and Federico Centrone. **Oct. 2024**. “Energetic Analysis of Emerging Quantum Communication Protocols”. In: arXiv: [2410.10661 \[quant-ph\]](https://arxiv.org/abs/2410.10661). URL: <https://arxiv.org/abs/2410.10661>.

THESIS AND MONOGRAPHS

- [8] **Yoann Piétri**. “System Integration of High-Performance Continuous-Variable Quantum Key Distribution”. PhD Thesis.
- [9] **Yoann Piétri**. **Sept. 2020**. “Quantum Cryptography”. Master Thesis. Imperial College London.

Scientific Conferences

INVITED TALKS

QUEST-IS

TUTORIAL: QUANTUM KEY DISTRIBUTION: FROM THEORY TO PRACTICAL APPLICATIONS

Saclay, France

December 2025

Workshop Synchronisation de précision et réseaux

QOSST: AN OPEN SOURCE SOFTWARE FOR CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION

Villetaneuse, France

October 2024

CONTRIBUTED TALKS

3rd Colloquium GDR TeQ “Quantum Technologies”

HIGH PERFORMANCE HETERODYNE RECEIVER FOR QUANTUM INFORMATION PROCESSING IN A LASER WRITTEN INTEGRATED PLATFORM

Grenoble, France

November 2025

International Conference on Quantum Energy (ICQE)

ENERGETIC ANALYSIS OF EMERGING QUANTUM COMMUNICATION PROTOCOLS

Presented by Raja Yehia

Padova, Italy

June 2025

Second Quantum Energy Initiative Workshop

ENERGETIC ANALYSIS OF EMERGING QUANTUM COMMUNICATION PROTOCOLS

Presented by Raja Yehia

Grenoble, France

January 2025

Quantum Optical 2.0 Conference and Exhibition

QOSST: A HIGHLY MODULAR OPEN SOURCE PLATFORM FOR CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION

APPLICATIONS

Rotterdam, Netherlands

June 2024

1st Colloquium GDR TeQ “Quantum Technologies”

DEVELOPMENT OF INDUSTRIAL CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION SYSTEMS

Presented by Manon Huguenot

Montpellier, France

November 2023

23rd International Conference on Transparent Optical Networks (ICTON)

HIGH-SPEED CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION WITH ADVANCED DIGITAL SIGNAL PROCESSING

Presented by Matteo Schiavon

Bucharest, Romania

July 2023

Optical Fiber Communication Conference (OFC)

CV-QKD RECEIVER PLATFORM BASED ON A SILICON PHOTONIC INTEGRATED CIRCUIT

Optical Fiber Communication Conference (OFC)

INP-BASED CV-QKD PIC TRANSMITTER

Presented by Jennifer Aldama

San Diego, USA

Mars 2023

San Diego, USA

Mars 2023

International Conference on Integrated Quantum Photonics (ICIQP)

A VERSATILE PIC-BASED CV-QKD RECEIVER

Lyngby, Denmark

October 2022

POSTER PRESENTATIONS

2nd Colloquium GDR TeQ Quantum Technologies

QOSST : A HIGHLY MODULAR OPEN SOURCE SOFTWARE FOR CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION

Paris, France

November 2024

14th International Conference on Quantum Cryptography (QCRYPT)

POST-QUANTUM CRYPTOGRAPHICALLY-SECURED TRUSTED NODE FOR QUANTUM KEY DISTRIBUTION IN A DEPLOYED NETWORK

Vigo, Spain

September 2024

6th Seefeld Workshop on Quantum Information, Seefeld, Austria (2024)

POST-QUANTUM CRYPTOGRAPHICALLY-SECURED TRUSTED NODE FOR QUANTUM KEY DISTRIBUTION IN A DEPLOYED NETWORK

Seefeld, Austria

June 2024

1st Colloquium GDR TeQ “Quantum Technologies”

EXPERIMENTAL DEMONSTRATION OF CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION WITH A PHOTONIC INTEGRATED RECEIVER AND MODULAR SOFTWARE

Montpellier, France

November 2023

13th Colloquium on Quantum Engineering, Fundamental Aspects to Applications

CV-QKD RECEIVER PLATFORM BASED ON A SILICON PHOTONIC CHIP

Palaiseau, France

November 2022

12th International Conference on Quantum Cryptography (QCRYPT)

PARISREGIONQCI: A PARISIAN QUANTUM NETWORK

Taiwan, Taiwan

August 2022

12th International Conference on Quantum Cryptography (QCRYPT)

A VERSATILE PIC-BASED CV-QKD RECEIVER

Taiwan, Taiwan

August 2022

International Conference on Quantum Communication, Measurement and Computing (QCMC)

A VERSATILE CV-QKD SYSTEM WITH A PIC-BASED RECEIVER

Lisbon, Portugal

July 2022

12th Colloquium on Quantum Engineering, Fundamental Aspects to Applications

A VERSATILE AND HIGH-PERFORMANCE PIC-BASED CV-QKD RECEIVER

Paris, France

November 2021

Seminars

Cryptography in a Quantum World - Paris Rally

EXPERIMENTAL QUANTUM CRYPTOGRAPHY AT LIP6

Paris, France

May 2024

Continuous Variable Days

EXPERIMENTAL VERIFICATION OF BOSON SAMPLING

Paris, France

May 2024

QURIOSITY Seminar at Telecom Paris

EXPERIMENTAL CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION IN LIP6: OPEN SOURCE SOFTWARE, INTEGRATED PHOTONICS AND DEPLOYED NETWORKS

Palaiseau, France

Mars 2024

Quantum Future group Seminar at UniPadova

HIGH SPEED QUANTUM KEY DISTRIBUTION WITH CONTINUOUS VARIABLE: SYSTEM, INTEGRATED DEVICES AND QUANTUM NETWORK IN PARIS

Padova, Italy

May 2023

Supervision

PHD STUDENTS

2025-Present	Simone Conton , <i>Network Integration of Quantum Communication Systems</i>	Co-supervised at 45%
2025-Present	Youri Cherif , <i>Exploration of Interfaces Between Quantum Communication and Computing</i>	Co-supervised at 50%

INTERNSHIPS

2025	Youri Cherif , Master Thesis, <i>Towards an Experimental Verification of Boson Sampling</i>	Co-supervised at 40%
2025	Simone Conton , Master Thesis, <i>Implementation of Practical Mode-Pairing Quantum Key Distribution Systems</i>	Co-supervised at 80%
2024	Tom Guerinel , M1 Internship, <i>Study of Hybrid Quantum Key Distribution Systems</i>	Co-supervised at 60%
2024	Salomé Perrin , M1 Internship, <i>Implementation of a BB84 pedagogical demonstrator</i>	Co-supervised at 80%
2024	Thomas Liege , Master Thesis, <i>Study and optimization of Quantum Key Distribution devices on an optical link simulating atmospheric disturbances.</i>	Co-supervised at 30%
2024	Sarah Layani , M1 Internship, <i>Experimental Quantum Key Distribution: Techniques and Applications</i>	Co-supervised at 80%
2023	Nessim Dridi , M1 Internship, <i>Real Time Calibration for Continuous-Variable Quantum Key Distribution</i>	Co-supervised at 20%
2022	George Crisan , M2 Internship, <i>Post Processing of Continuous-Variable Quantum Key Distribution</i>	Co-supervised at 80%

RESEARCH PROJECTS

2024	Émilie Gillet , M1 Research Project, <i>Optimization of Digital Signal Processing algorithms for Continuous-Variable Quantum Key Distribution</i>
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Reviewing activities

Referee for the following journals/conferences: Nature Communications, Quantum, Optica, Journal of Lightwave Technology (JLT), Physical Review Applied, Photonics Research, New Journal of Physics (NJP), Quantum Information Processing Conference (QIP), Optics Communications, Quantum Science and Technology (QST), Optics Express, Optics Letters, IEEE Photonics.

Teaching

Teaching summary: 226h total (6h lectures, 220h tutorials). L1 and M2, including Mathematics, programming (C, Python) and Quantum Cryptography at Sorbonne Université.

Lecture (4h), Tutorial (14h)

MUSINQ02, QUANTUM CRYPTOGRAPHY, M2

Sorbonne Université, France

2024

Tutorial (38.5h)

LU1IN002, ÉLÉMENTS DE PROGRAMMATION 2, L1

Sorbonne Université, France

2024

Lecture (2h), Tutorial (16h)

MUSINQ02, QUANTUM CRYPTOGRAPHY, M2

Sorbonne Université, France

2023

Tutorial (38.5h)

LU1IN002, ÉLÉMENTS DE PROGRAMMATION 2, L1

Sorbonne Université, France

2023

Tutorial (36h)

P1.LU1MA011, MATHÉMATIQUES POUR LES ÉTUDES SCIENTIFIQUES, L1

Sorbonne Université, France

2022

Tutorial (38.5h)

LU1IN001, ÉLÉMENTS DE PROGRAMMATION 1, L1

Sorbonne Université, France

2022

Tutorial (38.5h)

LU1IN002, ÉLÉMENTS DE PROGRAMMATION 2, L1

Sorbonne Université, France

2022

Outreach

2024	Fête de la Science , French national Science fair	Sorbonne Université
2023	Fête de la Science , French national Science fair	Sorbonne Université
2022	Fête de la Science , French national Science fair	Sorbonne Université
2022	Creation of an animated vulgarization video , On the subject of entanglement	QICS
2022	Quantum vulgarization talk , at FedeRez, national Federation of student network organisations	Lille, France
2021	Fête de la Science , French national Science fair	Sorbonne Université
2021	Quantum vulgarization talk , at FedeRez, national Federation of student network organisations	Saclay, France

Open Source work

QEnergy

SOFTWARE TO ESTIMATE THE ENERGETIC CONSUMPTION OF QUANTUM COMMUNICATION PROTOCOLS

2024

<https://github.com/RajaYehia/QEnergy>

QOSST: Quantum Open Source Software for Secure Transmissions

OPEN SOURCE SOFTWARE FOR EXPERIMENTAL CONTINUOUS-VARIABLE QUANTUM KEY DISTRIBUTION

2024

<https://github.com/qosst/>

etsi-qkd-014-client

PYTHON CLIENT OF THE ETSI QKD 014 CLIENT

2022

<https://github.com/nanoy42/etsi-qkd-014-client>

Responsibilities

2021-2024 Participation to the organization of the QI team group yearly workshop

2021-2022 Organizer of group seminars in the QI Team of LIP6

2021-2022 Website manager the QI Team of LIP6, Including creation of the website, <https://qi.lip6.fr>

Languages

Spoken languages: French (native), English (fluent), Spanish (elementary), Italian (beginner), German (beginner).

Programming languages: Python (advanced), C (intermediate), Julia (beginner).