QURIOSITY - Quantum Information Processing and Communication Saclay

&

QMI – Quantique, Mathématiques, Informatique

Dîner des partenaires – 19 Mars 2026

Romain Alléaume
Télécom Paris – Institut Polytechnique de Paris

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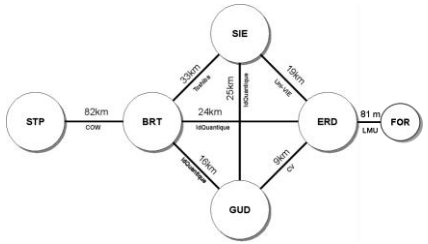
Telecom Paris à la pointe de la R&D en Communications Quantiques durant les 20 dernières années

First European QKD network (Vienna, 2008)

SECOQC



INSTITUT d'OPTIQUE GRADUATE SCHOOL

cnrs

THALES

TELECOM ParisTech

SEQURENET
A QUANTUM KEY TO NETWORK SECURITY

Spin-off SeQureNet (2008-17)

CV-QKD Technology Dvt

Record distance of 100 km (2012)

First Commercial System (2013)

Collaborative projects with key actors (2005-2018)

Network and Cryptography (FREQUENCY)

Implementation Sec, Q hacking (Q-CERT, ETSI)

Multiplexing (Quantum WDM)

Quantum Networks (QCALL)

IDQ

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

NICT 独立行政法人 情報通信研究機構 National Institute of Information and Communications Technology

UNIVERSITY OF CAMBRIDGE

TOSHIBA Leading Innovation

清華大學 Tsinghua University

UNIVERSITY OF WATERLOO | IQC Institute for Quantum Computing

Key Actor of the Q Comm Pillar in QT Flagship (2018->2030)

CiViQ

Continuous Variable Quantum Communication

*European Quantum Technology Flagship Project: **2018-2021***

21 Partners, 3 years, 10 M€ budget

Q Comm R&D, Telecom Manufacturers, Network Operators

OPEN QKD

European QKD Testbed

*European Quantum Technology Flagship Project: **2019-2022***

38 Partners, 3 years, 15 M€ budget

QSN PARTNERSHIP

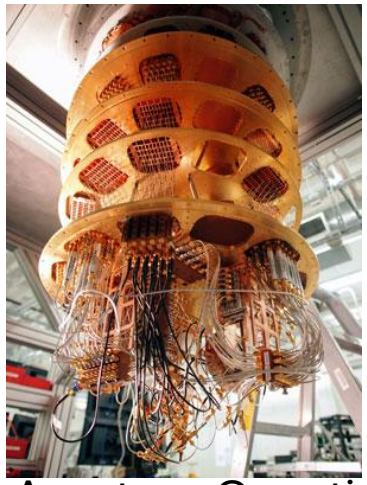
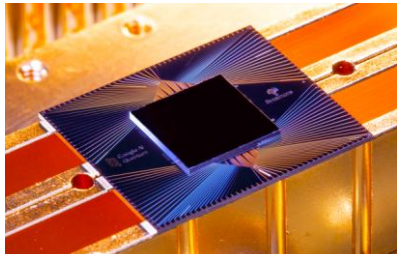
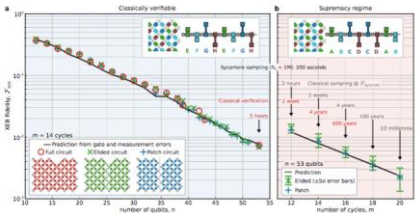
Quantum Secure Network Patnership

*European Quantum Technology Flagship Project: **2023-2027***

41 Partners, 3.5 years, 25 M€ budget

Q Comm R&D, Foundry, Telecom Manufacturers, Netw. Operators

Une décennie d'accélération

Avantage Quantique Computationnel
Arute et. al, Google AI, Nature 2019

- Numérique
- Ingénierie
- Etatique + Entreprenarial

➔ Essor international
➔ Compétition Géopolitque

4 Mars 2026

Opportunités Quantiques pour TELECOM Paris

- Déménagement à Palaiseau
- Partenariat avec Inria
- QT Flagship, EuroQCI
- Plan Quantique National

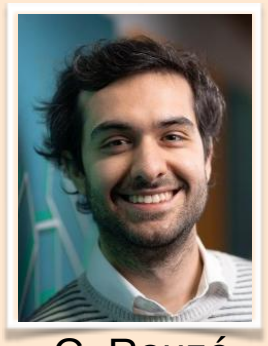
1. Création d'une nouvelle équipe : QURIOSITY
2. Résultats de Recherche au meilleur niveau international
3. Création d'un nouveau programme de Master 2: QMI

Quriosity team today

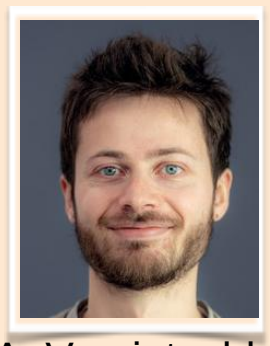
Permament Staff

R. Alléaume
Professor

P. Brown
Assoc. Professor
(dec. 2021)

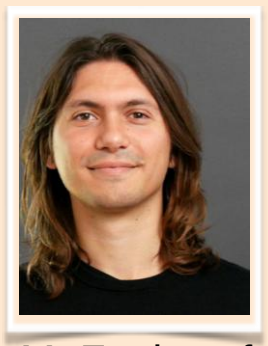


C. Rouzé
Inria ISFP
(sept. 2023)

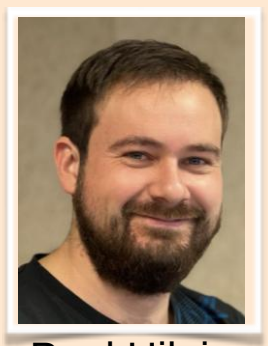


A. Vanrietvelde
Assist. Professor
(nov. 2023)

M. Weilenmann
Inria CRCN
(feb 2025)



M. Fanizza f.
Inria CRCN
(july 2025)



Paul Hilaire.
Junior Professor
(May 2025)

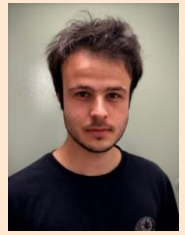
12 PhD students

J. Kochanowski

T. Nemoz

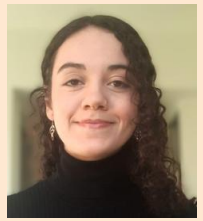
G.Doat

O. Mestoujian



A. Almasi

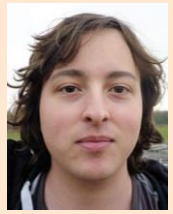
M. Pompili



M. Dridi

T. Pousset

J. Lucas

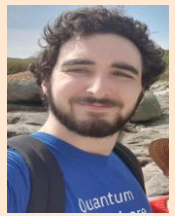


S. Stengele

S. Jung

K. Hakem

4 PostDocs



G. Ricard

D. Bugar

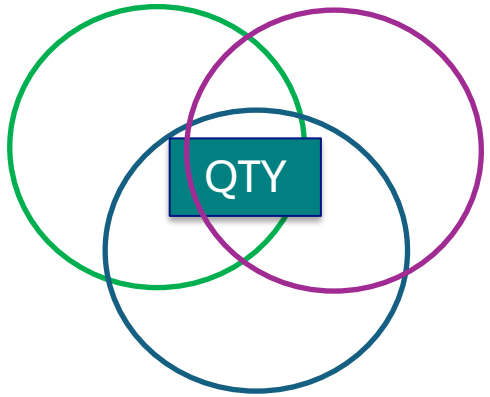
S. Srivastava

A. Tasdighi

Quriosity Research Positioning

Th. Computer Science

Quantum Computing
Algorithms & Complexity
Quantum Error Correction
Cryptography

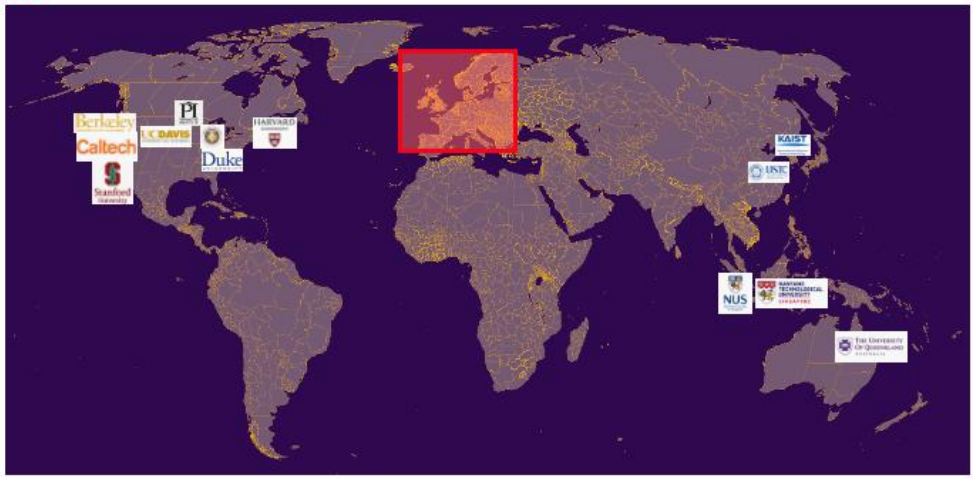


Mathematics

Maths of Q Information
Optimization, Algebra, Functional Analysis

Engineering

Quantum Communications
Photonics

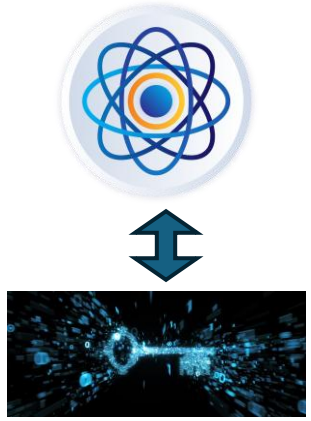


Active network of international collaborations

- **With Top Quantum Centers**: TUM, Copenhagen, ICFO, Cambridge, Oxford, Harvard, Stanford, Berkeley, ENS Pisa, Quandela, Sorbonne U, Quantum-Saclay

- **With Key International Leaders**: Ryan O'Donnell, Gerald Milburn, Omar Fawzi, Rob Spekkens, Nicolas Gisin, Andreas Winter, Roger Colbeck, Elham Kashefi

Recent Research Highlights // (7 accepted paper at QIP 2026)

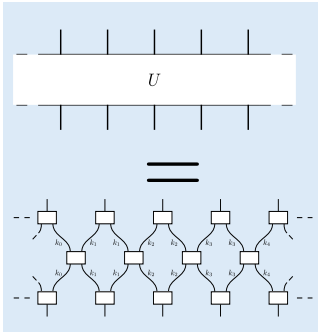


Hybridize classical and q cryptography

First Key Establishment protocol with
Everlasting Security
and
performance beyond QKD

2 Patents:
EP15305017.4 ,
WO2016110582

RA. PB *et al.* ***Quantum* 2025**

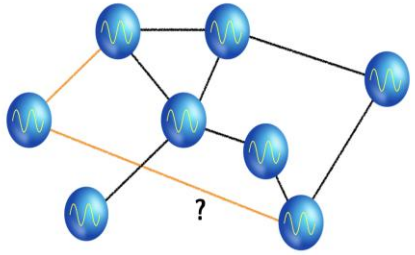


Causal decompositions of q cellular automata

AV *et al.*
arxiv:2506.22219

Partitions in Q Theory
arxiv: 2506.22218

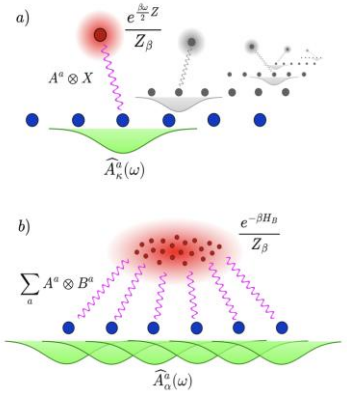
Accepted Talks in Causalworlds, QSQW, QPL, and **QIP 2026**



Learning Gaussian states and processes

Efficient Hamiltonian, structure and trace distance learning of Gaussian states ,

MF, CR, *Stilck-França,* ***QIP 2025,*** *accepted in* ***Nature Communications***



Q computation via system bath couplings

Using environmental noise at one's advantage, provides natural error resilience,

Application : q. approx.counting

Efficient thermalization and universal quantum computing with quantum Gibbs samplers, ***CR*** *et al.,* ***STOC 2025, Nature Physics 2026***

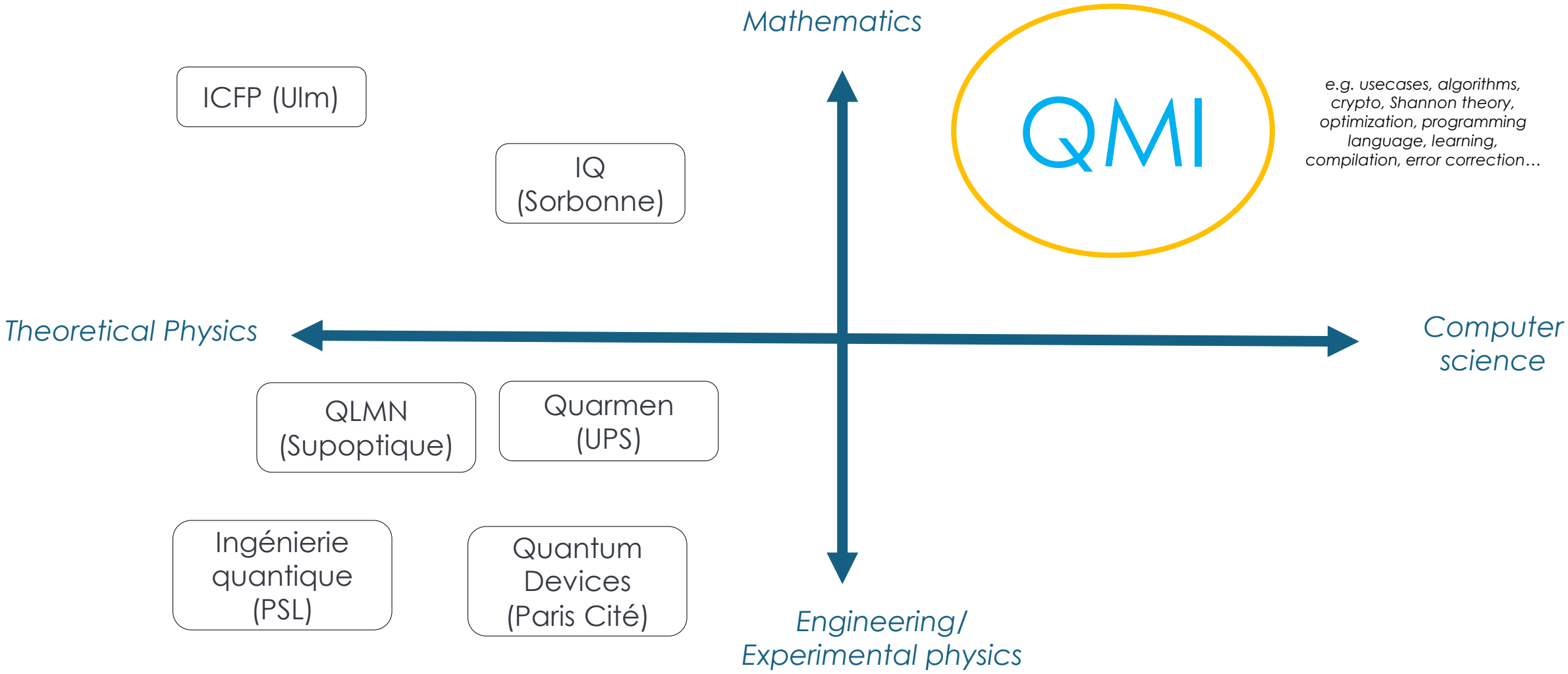
Master 2 QMI

Quantique, Mathématiques, Informatique

Start in 2025

- Excellent first cohort ,
  17 students, (TP, X, ENS..)
- Super promising applications for 2026!

QMI
= **Cutting-edge** program with a **unique** positioning (in FR)



QMI Teaching Staff

Romain Alléaume

Augustin Vanrietvelde

Marco Fanizza

Peter Brown

Mirjam Weilenmann

Paul Hilaire

Cambyse Rouzé

Titouan Carette

Marc-Olivier Renou

Benoît Valiron

Matt Wilson

Stéphane Vialle

Pablo Arrighi

Renaud Vilmart

Oguz Kaya

Jean-Pierre Tillich (CNRS)

Ludovic Perret (Sorbonne)

Michael Jabbour (Télécom SudParis)

Partenariats / Collaborations

- **Master 2 QMI**
  - **Stage de Recherche M2**
  - **QMI Industry Seminar** (8 séminaires en 2025)
  - Actions ciblées de Partenariat
    - Ecole d'été
    - Orientation professionnelle étudiants

- **Recherche**

  Partenariats en synergie avec positionnement Blue Sky de Quriosity

  - **Projet de recherche partenariaux FR / EU**
  - Collaborations scientifiques ciblées (incl. CIFRE)
  - Chaires / Labos Communs

Merci pour votre attention