

Application BASTRI

Fiches Equipes

QURIOSITY (SR0934SR)

Communication et Traitement Quantiques de l'Information
QURIOSITY

Statut: Décision signée

Responsable : Romain Alleaume

Mots-clés de "A - Thèmes de recherche en Sciences du numérique - 2024" : A3.4. Apprentissage et statistiques , A4.2. Codes correcteurs , A4.3. Cryptographie , A4.3.4. Cryptographie quantique , A4.6. Authentification , A5.9. Traitement du signal , A6.1.2. Modélisation stochastique , A6.5. Modélisation mathématique pour les sciences physiques , A7.1. Algorithmique , A7.1.4. Algorithmique quantique

Mots-clés de "B - Autres sciences et domaines d'application - 2024" : B5.11. Systèmes quantiques , B6.2. Technologies pour les réseaux , B9.1. Education , B9.10. Confidentialité, vie privée

Domaine : Algorithmique, programmation, logiciels et architectures
Thème : Algorithmique, calcul formel et cryptologie

Période : 01/01/2023 -> 31/12/2026
Dates d'évaluation :

Etablissement(s) de rattachement : IP-PARIS
Laboratoire(s) partenaire(s) : LTCI

CRI : Centre Inria de Saclay
Localisation : Centre de recherche Inria de Saclay
Code structure Inria : 111106-0

Numéro RNSR : 202324386L
N° de structure Inria: SR0934SR

Présentation

QURIOSITY's ambition is to extend the application horizon of quantum information science by addressing novel questions positioned at the intersection between theoretical research in quantum information and the engineering of quantum devices, with a focus on approaches combining digital and quantum photonics technologies.

The overarching goal of the project-team will be to push forward our ability to harness and exploit high-dimensional complex quantum systems for quantum information processing and quantum communications purposes.

Leveraging a dual approach combining fundamental research in quantum information with quantum photonics expertise, QURIOSITY will strive to take advantage of and develop strong synergies with the unique quantum ecosystem of Saclay and to pursue objectives that have the potential to bring radical advances to several application domains of quantum technologies, ranging from cryptography to computing.

Axes de recherche

Research axis 1: Quantum cryptography complexity and hardware frontiers

Combine quantum and complexity-based cryptographic schemes, and consider new security models, to push forward security and practicality of quantum cryptography. Design quantum-enhanced cryptographic hardware, leveraging concepts based on computational hardness and quantum information.

Research axis 2: Multimode photonic systems for quantum information processing and communications

Conceive and engineer photonic-based processors and systems capable of achieving quantum advantage in computation or communication tasks.

Research axis 3: Mathematical foundations of quantum information

Contact

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- **Secrétariat Tél :**

En savoir plus

- Site de l'équipe
- Site sur inria.fr
- Derniers Rapports d'Activité : 2023

Documents sur la structure

- Intranet
- Privés

Décisions

- 15890 (03/01/2023) : création

Localisation

- **Adresse postale :** Centre de recherche Inria de Saclay
Campus de l'École Polytechnique - Bâtiment Alan Turing
1 rue Honoré d'Estienne d'Orves 91120 Palaiseau France
- **Coordonnées GPS :** 48.714, 2.206

Develop efficient quantum information processing schemes implementable on near-term hardware and advance the theoretical framework to understand the fundamental limits of noisy quantum information processing.

Relations industrielles et internationales

- In the context of the Quantum Technology Flagship, participation to the following projects: Quantum Secure Network Partnership (QSNP), PETRUS (coordinating action), and active collaborations within other key partners, notably ICFO, Sorbonne Université, UPM, Politecnico di Bari, Austrian Institute of Technology
- In the context of EuroQCI, Industrial collaborations with QKD manufacturers and quantum network integrators: Orange, Thales, Deutsche Telekom, IDQuantique (Geneva), Exail (Besançon, LuxQuanta (Barcelona)
- Technical University München, on quantum information theory and mathematical physics
- Institute of Quantum Computing, on QKD security proofs
- University of Leeds, on coherent quantum communications