QuantaGENOMICS

Quantum Enabled Secure Multiparty Computation for Genomic Medicine

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Introduction

This deliverable corresponds to the seventh newsletter and presents the main activities carried out during the previous semester. The newsletter will be disseminated through different vias, including the QuantaGENOMICS project 'website, and can be found attached to this document.

Conclusion

The deliverable was accomplished.

QuantaGENOMICS

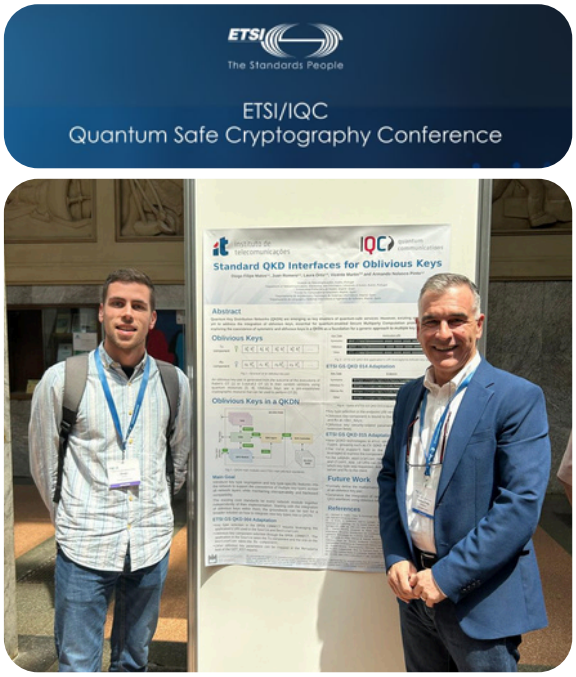
NEWSLETTER - OCTOBER, 2025

7TH EDITION

THE 6TH QUANTAGENOMICS GENERAL ASSEMBLY

The **sixth QuantaGenomics General Assembly** was held online on the 28th of May 2025. The meeting gathered representatives from all partner institutions (IT, SU, ICFO, INRIA, Ophiomics, and UPM) to review the progress of ongoing tasks and activities, and to outline the next steps according to the project's work plan. Participants had the opportunity to present updates on their respective work packages, exchange ideas, and coordinate upcoming actions to ensure smooth progress toward the project's objectives.

PARTICIPATION IN THE ETSI/IQC QUANTUM SAFE CRYPTOGRAPHY CONFERENCE 2025 IN MADRID, SPAIN



Reseacher Diogo Matos and Professor Armando Pinto from Institutod e Telecomunicações at the ETSI/IQC Quantum Safe Cryptography Conference 2025.

On June 4, 2025, Professor Armando and researcher Diogo Matos from Instituto de Telecomunicações presented the **poster** "*Standard QKD Interfaces for Oblivious Keys*", developed within the scope of the **QuantaGenomics project,** in the **ETSI/IQC Quantum Safe Cryptography Conference 2025** in Madrid, Spain.

The conference, designed for members of the **business**, **government**, and **research communities** involved in **cryptographic standardization**, aimed to foster knowledge exchange and collaboration to support the transition of cyber infrastructures and business practices toward a secure and resilient future in the era of quantum computing.

ABOUT THE PROJECT

QuantaGenomics is a QuantERA ERA-NET Cofund in Quantum Technologies project with a focus on the development of a quantum-enabled secure multiparty computation service for collaborative genomic medicine.

In this issue:

The 6th QuantaGenomics General Assembly; Participation in the ETSI/IQC Quantum Safe Cryptography Conference 2025; VIECRYPT 2025; ICTON 2025; SIGCOMM Conference; SPIE Sensors + Imaging 2025 Conference; and Description of Activities.

PARTICIPATION IN THE VIECRYPT 2025 WORKSHOP

Paula Alonso (ICFO).

In June, Paula Alonso delivered the talk "Secure Multi-Party Computation from Entanglement-Based Oblivious Transfer in the Noisy Quantum Storage Model" at the **VieCrypt 2025** – Vienna Workshop on Quantum Cryptography Beyond Quantum Key Distribution, held in Vienna, Austria.

The workshop gathered leading experts in computer science and quantum photonics to promote interaction between the theoretical and experimental communities in quantum cryptography. With a focus on quantum primitives that go beyond quantum key distribution, the event featured presentations on recent advances, open challenges, and novel photonic implementations.

25TH INTERNATIONAL CONFERENCE ON TRANSPARENT OPTICAL NETWORKS – ICTON 2025

Margarida Almeida and Hugo Costa, PhD students, participated in the **25th International Conference on Transparent Optical Networks** (ICTON 2025), held from 6 to 10 July 2025 in Barcelona, Spain, under the scope of the Quantagenomics project.

The conference brought together leading experts in optical communication technologies, offering an excellent opportunity to discuss and showcase advances in the field.

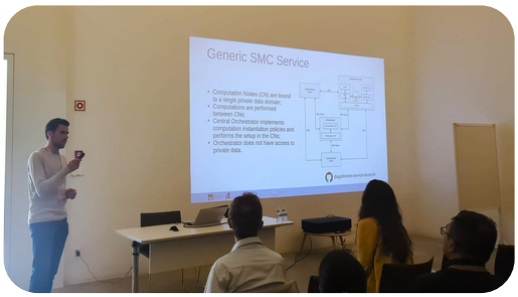
Margarida Almeida (IT) and Hugo Costa (IT) at ICTON 2025.

SIGCOMM 2025 CONFERENCE

The researcher Diogo Matos participated in the **ACM SIGCOMM 2025 conference**, held on 8 September in Coimbra, Portugal. His paper, entitled "*Quantum-Enabled Secure Computation Medical Service*," was published in the conference proceedings and is available here.

ACM SIGCOMM is the flagship annual conference of the ACM Special Interest Group on Data Communication (SIGCOMM), bringing together leading researchers and practitioners in the field.

The **Universidad Politécnica de Madrid (UPM)** also took part in this year's conference.



Diogo Matos (IT) at SIGCOMM Conference.

SPIE SENSORS+IMAGE: QUANTUM TECHNOLOGIES FOR DEFENCE AND SECURITY II

Íris Guilherme (IT) at SPIE Sensors + Imaging 2025.

Íris Guilherme, MSc student, participated in the **SPIE Sensors + Imaging 2025 Conference**, held on 16 September in Madrid, Spain, under the scope of the **QuantaGENOMICS** project. She presented her paper "Polarization Multiplexing CV-QKD with Polarization Drift Post-Compensation", which was distinguished with the **Best Student Paper Award**.

The SPIE Sensors + Imaging 2025 conference showcases the latest advances in sensor and photonic technologies for imaging and environmental monitoring, as well as innovations addressing homeland security, defence, and counterterrorism challenges.

DESCRIPTION OF ACTIVITIES

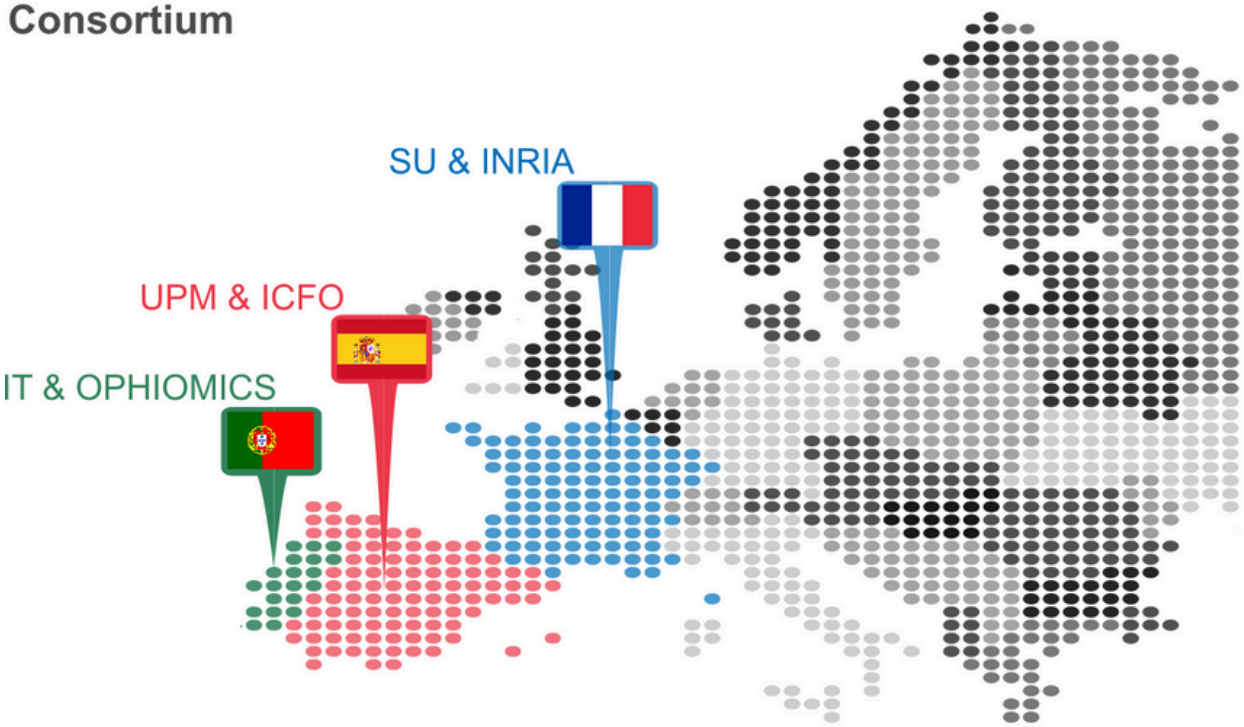
Work Package 2 – Quantum Foundations for SMC – was successfully completed in Month 21 (M21).

Work Package 3 – Laboratory Validation was concluded in Month 27 (M27). This WP delivered three milestones on schedule:
D3.1 – Experimental validation of a novel DV-based quantum oblivious transfer protocol for secure multiparty computation (M24)
D3.2 – Report on the laboratory proof-of-principle validation addressing the CV approach (M24)
D3.3 – Report on the laboratory proof-of-principle validation addressing entanglement (M27)
All deliverables were successfully completed, providing experimental evidence that supports the project's quantum communication and security concepts.

Work Package 4 – Integration in a Classical Optical SDN Network began in Month 19 (M19) with Task 4.1, and all three tasks are currently in progress. This WP focuses on integrating quantum functionalities within a classical optical software-defined networking (SDN) environment, bridging the gap between laboratory results and practical network applications. Two deliverables have already been successfully completed:
D4.1.1 – Report supporting the decision on basing the SMC application use case on a specific approach (M28)
D4.1.2 – Report on the integration of quantum resources and protocols (M33)
At the non-technical level, progress continues within **Work Package 1**, dedicated to administrative and coordination activities, and **Work Package 5**, focused on dissemination, communication, and outreach to maximize the project's visibility and impact.

QuantaGENOMICS

Consortium



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