



Pan-European

Quantum Internet
Hackathon

Challenges

:: Pan-European Quantum Internet Hackathon ::

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2. October 2019

TIME SAVING • KNOWLEDGE OVERVIEW • UNEXPECTED INSIGHTS

800 ANNI
1222-2022



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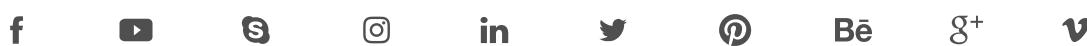


Make Complexity Irrelevant



Challenges

Failing Forward Fast Development Cycles



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RemotelyGreen

Pan-European Quantum Internet Challenge

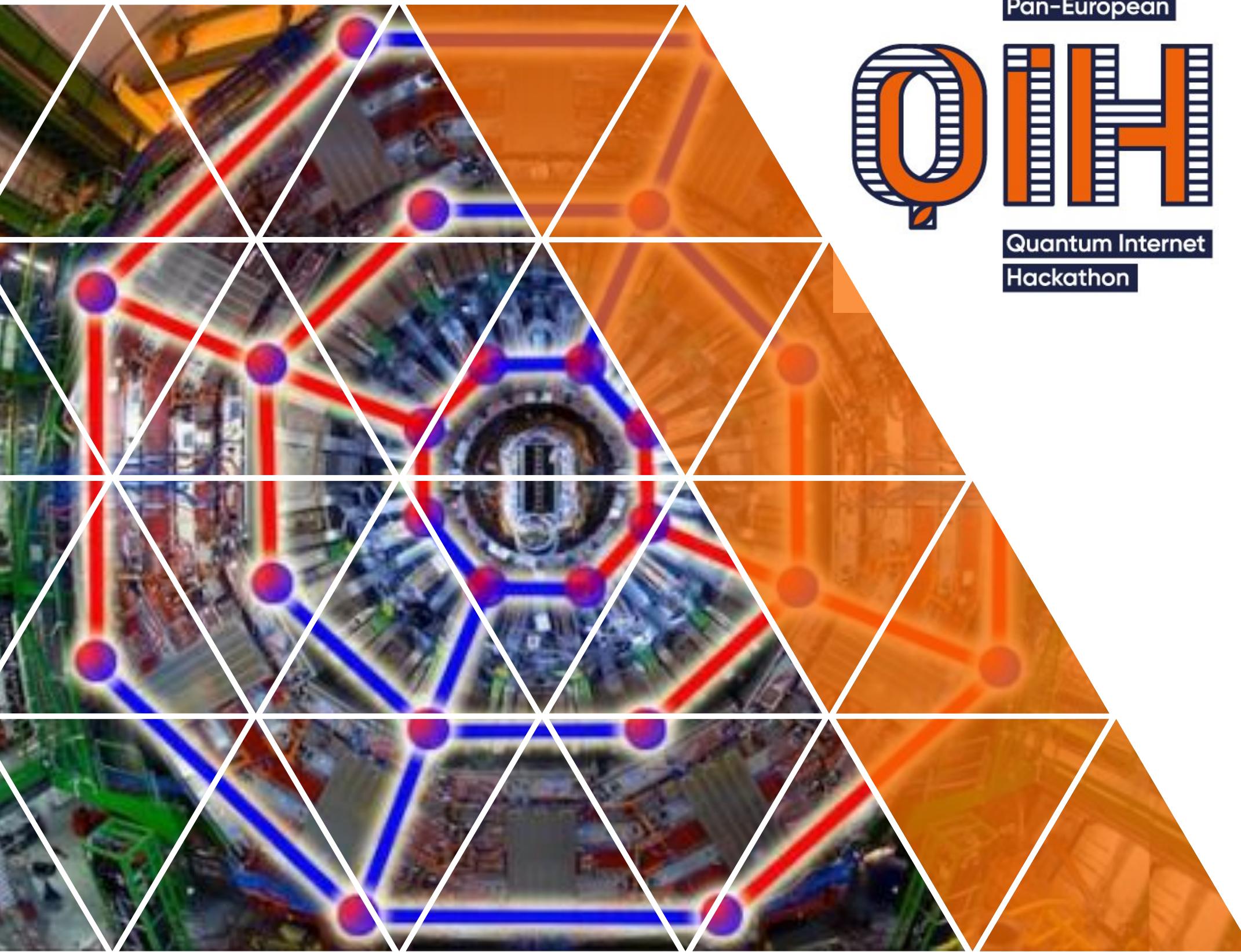
Purely virtual meetings are becoming more and more common, as businesses, research institutions, and other organisations choose them over air travel. On the one hand technologies like increasing internet bandwidth and virtual or augmented reality are helping to improve the user experience; on the other, virtual meetings offer big reductions in the organisation's environmental impact and are cheaper to attend. However, in the era of AutoTune and DeepFakes these platforms come with potentially major security challenges. How can quantum key distribution, encryption and signatures help tackle this problem?

Satellite QKD

Pan-European Quantum Internet Challenge

Whose airplane or logistic drohne should be hacked next? Or: How could this be prevented? This project aims to explore the possibility of integrating Quantum Key Distribution into flight safety. Can it secure flight data transmission (e.g. like ADS-B) in the future? We would like to explore the possibility of a secured transmission of broadcasts between airplanes that might secure, extend, and eventually replace current Traffic Collision Avoidance Systems (TCAS) and Air Traffic Management (ATM) systems. The application of such systems are expected to extend to drones carrying freights and other autonomous flights.





9 Quantums

Pan-European Quantum Internet Challenge

9 Men's Morris is a 2000 years old strategy game where players have millions of options to choose from. Having so many options for every move makes the game computationally difficult to model and implement. Recent developments in Quantum Computing showed that it can provide speed-ups when training Machine Learning models. In this challenge the aim is to build a Quantum Machine Learning agent that can play the game by the rules and build it in such a way, that it can be trained using a Quantum Computer Simulator with a good moves dataset. How can we remotely interact (and play remotely) with graph engines in a quantum key distributed and encrypted way?



KnowledgeEx

Pan-European Quantum Internet Challenge

AI & ML technologies are already transforming the structures and collaborations inside of organizations, but recently an increased focus is set of how they can foster inter-disciplinary, inter-sectorial and inter-organizational knowledge and innovation exchange. The AI supported digital transformation has redefined how organizations generate, share and consolidate data and innovation across organization boarders. These date-driven systems help to manage the complexity of international partnerships of Knowledge Management and Exchange. How can Quantum Key Distribution facilitate to build the TRUST needed for such systems?





PersonalData

Pan-European Quantum Internet Challenge

In an era of personal data portability (GDPR Art 20), an individual is legally entitled to ask a company to transfer the own data to another company. How can both companies and the individual make sure that this personal data transfer is secure, despite having never talked to each other before? How can Quantum Key Distribution empower the individual to authenticate both transfer involved companies or could make use of Member States-based chains of trust? How can different national standards or procedures made compatible?



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Judges : Mentors

with Quantum :: Internet :: Hackathon backgrounds

Our hackathons are:

non-commercial; we are a not-for-profit organisation and have no monetary prizes

all resulting software and tools are released under non-commercial licenses

non-competitive; we prefer cooperation and teamwork

Bilge Demirköz

Professor of High Energy Physics at
Middle East Technical University



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A UNESCO-L'Oreal International Rising Talent researcher, Bilge Demirköz is a leading physicist, science outreach activist and educator in Turkey. With her team, she is building a particle irradiation facility for space radiation tests, with support from CERN under the CERN associate membership bill she helped pass through parliament. Demirköz is a role model for the next generation of scientists in Turkey and seeks to change the government's approach to science. She is a Young Global Leader of the WEF and is interested how in the quantum revolution will effect scientific computing.



Paul-Olivier Dehaye

Collective intelligence • Personal Data Protection
Founder & Director PersonalData.IO



Paul-Olivier Dehaye works on collective intelligence and personal data protection. He is the founder and director of PersonalData.IO and Hestia.AI, and sits on the board of MyData Global. Working with journalists, he has been an integral part of uncovering the Cambridge Analytica scandal, and features in the documentary: 'The Great Hack'.



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Sofia Vallecorsa

High Energy Physicists at CERN openlab



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Dr. Sofia Vallecorsa is a CERN physicist with extensive experience on software development in the High Energy Physics domain, in particular on Quantum Computing and Deep Learning applications within CERN openlab, a public-private partnership between CERN and leading ICT companies. Before joining openlab, Dr. Vallecorsa has been responsible for the development of Deep Learning based technologies for the simulation of particle transport through detectors at CERN and she has worked on optimisation of the GeantV detector simulation prototype on modern hardware architectures.



Mélissa Gaillard

CERN Openlab IT Communications Officer &
Deputy Group Leader

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Melissa Gaillard is the CERN openlab Communications Officer. Before joining CERN she has been working as the Latin America Marketing Manager and the International Division Business Intelligence Manager with Renault Trucks and as a Consultant and Project Manager with Frost & Sullivan, focusing on technology communication and marketing strategies. Melissa studied Marketing and Communication at Celsa - Paris IV Sorbonne after an hypokhagne and Khagne B/L.



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Mary Georgiou

CERN Systems Engineer • Machine Learning

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Maria Georgiou's research focuses on the development of an anomaly detection system with deep learning techniques for the CERN security log entries. She supports with her work CERN users with security related issues, as part of the computer security second line support and takes part in GPU resource virtualization as a tester. Her prior work includes testing Esper on producing statistics for the WLCG Transfers Dashboard, the implementation of Spark streaming jobs for computation of real time statistics on data transfer log entries as well as a File Transfer Service monitoring system.

