Barcelona brings together Quantum Communication Pioneers of European Quantum Flagship

More than 200 European leaders and experts in the field of Quantum Communications of the Quantum Flagship gather in Barcelona to review the current status of the European landscape in Quantum Communications and define the future actions for the further development and deployment of the technology in the region.

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Physics in the 20th century triggered a series of transformative discoveries that laid the groundwork for disruptive technologies that continue to shape the 21st century. From the development of quantum mechanics to the revolution in semiconductor and photonics technology, the insights gained have propelled innovations that are now integral to our modern society.

The emergence of quantum technologies (QTs) stands out as a hallmark of the 21st century.

These technologies have opened up new possibilities and pathways in many areas, in particular quantum communication, enabling the secure transmission of information across the current network using quantum key distribution protocols and setting the pillars for the deployment of a new future quantum internet.

Last week, on June 5, 2024, researchers, industry leaders and innovators in the field of quantum communications gathered for a dynamic and insightful conference at the AXA Auditorium (Barcelona). The event, entitled i¿½**Quantum Communications in Europe: Building the next generation of European quantum technology**i¿½, was organized by the Quantum Flagship projects Quantum Secure Networks Partnership (QSNP) and Quantum Internet Alliance (QIA) and hosted by ICFO. It housed policymakers, scientific experts, high-tech engineers, and technology start-ups to review and discuss the latest advancements and collaborations in this cutting-edge field, not only at the European level, but also gaining a clear context of the international panorama at hand.

The event was introduced by coordinators **Valerio Pruneri** (ICREA Prof. at ICFO and QSNP Coordinator) and **Stephanie Wehner** (Prof. at QuTech and QIA Coordinator). Then, as part of the morning sessions, **Gustav Kalbe**, Acting Director of Digital Excellence and Science Infrastructure at the European Commission delivered the welcome words, **Tanner Crowder,** Senior Policy Advisor for the White House Office of Science and Technology Policy (USA), and **Mikio Fujiwara**, Director of the Quantum ICT Collaboration Center (Japan), provided an overview of the international ecosystem and came forward on presenting the polices that each region is adapting to establish different programs to accelerate the research and development of quantum technologies and thus boost the economic and national security of these regions.?

The keynote talk given by **Nikolas Mohr**, Expert Partner on Digital & Tech strategy and transformation at McKinsey, delivered a compelling message about the "**Trends in Quantum Technology and the state of business in Quantum Communications**i¿½. In his overview, Mohr thoroughly explained the worldwide picture of the generation, investment and acceptance of QTs in general, and for Quantum Communication Technologies in particular. To date, the Global public investments in quantum technologies has reached **$42 billion in 2023**. He commented on the fact that in the near term, Quantum Communication is expected to continue producing technological advancements and attracting commercial interest and that its **adoption is expected to accelerate** over the coming decade as quantum computing **cybersecurity risks** increase. He continued to emphasize the importance of the creation of start-ups and their noteworthy value within the supply chain, by stating that the private sector investment tended to prefer to limit risks by avoiding uncertain, new technology and continue to investing in older, more established start-ups.

With this framework in mind, the projects **QSNP and QIA** overviewed their current status and progress, their challenges and long-term goals, and the search for synergies between the two initiatives. Then a **panel of start-ups** with representatives from **Luxquanta ThinkQuantum,**

Q*Bird, QBlox, AQT and Welinq, discussed a range of topics including the current challenges and opportunities within the quantum communications market, strategies for commercialization and the importance of fostering new talent. They delved into explaining the resilience and acceptance of the private sector customer market and early adopters to step forward in incorporating and beginning to implement quantum communications technology within their products and services to enhance their cybersecurity features. Finally, the event drew attention towards training and education. Participants underlined the staggering need for quantum talent workforce. Talent attraction and training took a notable step forward in 2023, where more than 360,000 people worldwide graduated with QT-relevant degrees, in more than 190 universities and more than 50 master's degrees. The European Union ranked in the top positions with the highest number of graduates in QT-relevant fields, which helps explain why scientists from EU institutions contributed most to quantum-relevant publications. However, the pressing need for a larger workforce ha propelled the search for new solutions to attract talent, including the creation o i¿½innovation hubsi¿½ which can serve as bridging points amongst the different secto s to accelerate and optimize collaborations and synergies between hem. Approaching the end of the event, the Secretary of Digital Policies at Governme t of Catalonia, **Gina Tost**, gave the closing remarks and emphasized the critical importance of collaboration between government, academia and industry to drive forward the quantum technology sectors. She expressed that i¿½The Government of Catalonia has demonstrated unwavering commitment to funding long-term effort quantum technology programs, by giving support to initiatives and projects within this field in particular, underlying Catalonia's belief in the importance of staying at the forefront of technological evolution but also highlighting its commitment to fostering a thriving ecosystem that nurtures groundbreaking discoveries while seeking to enable collaboration among experts in the fieldi¿? . QSNP coordinator Valerio Pruneri stated that, i¿½for the scientific community, this event in Barcelona gathered most of the European experts in the field of Quantum Communication and proved to be an insightful, fruitful event. It allowed us to engage in hard-core discussions, bring to the table the challenges and risks that we are facing, and all together with experts from many fields of knowledge, find solutions that have helped us build a reall strong quantum communication ecosystem in Europe, positioning the region as a leader i the fieldi¿½