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Quantum Materials, Technology and Key application

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Thematic Area: Quantum materials & multidisciplinary applications

Abstract

The conference provides a comprehensive overview of the second quantum technology revolution. It begins with an introduction to the fundamentals of quantum mechanics, including a survey of key principles such as superposition, entanglement, interference, and decoherence. The talk then delves into the practical applications of quantum technology, highlighting advancements in quantum materials, architectural elements of quantum computation, and quantum communication and the use of quantum key distribution (QKD) protocols for enhanced cybersecurity. The role of quantum technology in space communication and its potential impact on future networks like 6G and 7G are also explored. It addresses both the threats and opportunities of quantum computing to technologies like blockchain. Finally, it presents the application of quantum technology for global environment understanding and worldwide financial efforts to develop R&D in quantum technologies.

It will be concluded by outlining the technological, economic, and societal challenges facing the field.

Keywords : Quantum Materials, Quantum sensors, Quantum computation, quantum technologies, quantum and artificiel intelligence force, quantum communication.

Graphical abstract: Research fields map in quantum Technologies