Building Cyber Resilience: Threats, Enablers and Anticipation

ICFO contributes to AXA Research Fund publication with perspectives on the advent of quantum and the security issues it could entail

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ICREA Professor at ICFO, Dr Antonio Acin, AXA Chair in Quantum Information Science since 2016, is one of 20 expert contributors from academia, governmental and international organizations as well as the insurance industry to contribute to a collection of perspectives published by the AXA Research Fund (Winter 2021) in order to inform around the key question of building cyber resilience.

The 2021 AXA Future Risk Report found that experts view cyber the #2 top risk, second only to climate change. In this context, better understanding and estimating cyber risks is crucial to help develop informed strategies that consider the interconnectivity of our systems and the possible cascading consequences of a cyber-attack. These strategies need to couple prevention with resilience to damage.

The AXA Research Fund report i¿½Building Cyber Resilience: Threats, Enablers and

Anticipationi¿½ showcases insights into the changing dynamics of the cyber landscape. It considers diverse aspects of the puzzle, from the need for accountability as well as the right to privacy, the mitigation of cyber risks in the ever-changing nature of cyber space, necessary actions from the private sector, states and international bodies, cyber risks in the insurance market, and future scenarios and trends.

Prof Acin contributed with insights into the advent of Quantum and the security issues it could entail. He suggests that a promising solution to secure cryptography once the quantum computational power becomes strong enough to decrypt every protection we set, would be to use quantum to protect against quantum. This entails combining postquantum cryptography - the design of new protocols based on problems that are also difficult to solve for a quantum computer - and ?quantum physical security' - the design of quantum cryptography protocols whose security is based on the laws of quantum physics. With the two approaches combined, hackers will have a much more difficult time, as they will have to face complex computational problems and quantum phenomena at the same time.

This thoughtful report contemplates many of the biggest issues that will need to be continuously and thoroughly prepared and refined by all stakeholders in order for society to continue to enjoy the infinite benefits of the information age, while mitigating current and future threats.