

Designing our future Quantum Internet

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The principles of quantum mechanics are well known to promise a future quantum internet connecting a wide variety of quantum devices together in a coherent and ultimately secure fashion. Quantum repeaters will play a critical role in such a quantum internet, similar fashion to the importance of conventional repeaters in today's telecommunications internet. The inherent differences between classical physics and quantum mechanics mean that it is essential for us now to establish how a quantum internet will operate including the functionality required from quantum repeaters as well as the support our telecommunications internet will need to provide. Our considerations here will go far beyond quantum key distribution and focus on a network of connected quantum devices including computers and sensors. We will discuss how the efficient operation of such a quantum internet relies on the seamless integration of both quantum and classical communication resources.