

Quantum Information with Photons

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Abstract: Quantum information has the potential to be a transformative technology in the coming decades enabling secure information sharing, more sensitive measurements, and massive computational speedup for certain classically intractable problems. Light plays an important role in many quantum information systems, particularly for transmitting quantum bits. I will give a broad overview of the role that optical photons play in quantum computing and quantum networking. This includes a discussion of generating light that is suitable for quantum information applications, mediating effective interactions between photons to enable entangling operations, and engineering light-matter interfaces for reversible mapping of quantum information. I will highlight recent experimental results in my lab that illustrate these various research goals.

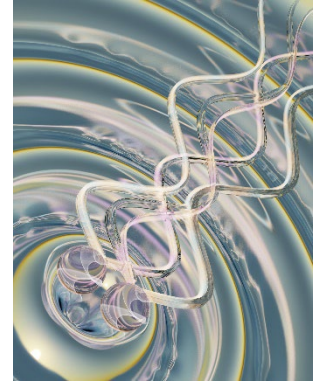


Image: Emily Edwards, IQIIST