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Quantum information and communication with high-dimensional encoding: the QuICHE project

High-dimensional photonic quantum information promises considerable advantages compared to the two-dimensional qubit paradigm, from increased quantum communication rates to increased robustness for entanglement distribution. The QuICHE project aims to unlock the potential of high-dimensional quantum technology by encoding information in the spectral-temporal degrees of freedom of light. In this project matched experimental tools and theoretical architectures for manipulating and characterizing such states will be developed, and their use in applications will be demonstrated, providing a unified platform for high-dimensional optical quantum information processing, communication, and sensing.

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