

PL1.2 - Keynote



Photonic quantum systems

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Abstract:

Quantum technologies promise a change of paradigm for many fields of application, for example in communication systems, in high-performance computing and simulation of quantum systems, as well as in sensor technology. Current efforts in photonic quantum science target the implementation of practical devices and scalable systems, where the realization of quantum devices for real-world deployment and controlled quantum network structures is key for many applications.

Here we review different approaches to advance current experimental approaches for scaling multi-dimensional photonic quantum systems and show our most advanced system for photonic quantum computing. Our research comprises integrated quantum circuits based on $\chi(2)$ -materials, spectral-temporal engineering of quantum light and features all needed experimental functionalities for future photonic quantum technologies.