QUASAR

Tue, 2012-03-27 08:24 - Lukas Theussl **Full Name:** Quantum States: Analysis and Realizations
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Location

University of Munich (LMU) Munich Germany
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See map: Google Maps

Website:
http://www.chistera.eu/projects/quasar

Running time: 2012-01-01 - 2013-12-31

Quantum Information Processing and Quantum Communication brought a radical, paradigmatic change in our understanding of the nature of information and of its use. Progress in efficient quantum computation and communication will be possible provided we gain a significantly improved comprehension of the underlying principles of quantum physics, have scalable analysis tools available to study the dynamics, decoherence, as well as the applicability of large quantum states, and, last but not least, have reliable and robust quantum technology components available.

The main objectives of QUASAR are thus to

- apply foundational principles of quantum physics to identify novel protocols for quantum communication and to optimize the efficient usage of quantum channels, both in theory and experiment
- develop scalable methods for quantum state analysis and introduce application oriented witnesses with high statistical significance and robustness against experimental imperfections
- implement these methods to analyse the dynamics and their applicability for quantum metrology for different decoherence models and identify possible feedback protocols to adaptively optimize metrological tasks
- develop a new approach for the production of highly integrated and reliable waveguide quantum circuits and implement photonic quantum logic operation for robust manipulation of high-dimensional multiqubit states and for quantum simulation tasks

QUASAR unites a broad variety of partners, ranging from theoretical and mathematical physics all the way to experimental quantum and nonlinear optics and includes an industrial partner focusing on possible deployment of integrated quantum logic circuits.

- Quantum Communication
- STREP
- Quantum Metrology, Sensing and Imaging
- CHIST-ERA

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