

QWAD

Sun, 2013-02-03 18:51 - [Lukas Theussl](#) **Full Name:** Quantum Waveguides Application and Development

Coordinator: Harald Weinfurter

Location

LUDWIG-MAXIMILIANS-UNIVERSITAET MUENCHEN Schellingstr. 4
Munich Germany

48° 8' 58.3368" N, 11° 34' 45.1344" E

See map: [Google Maps](#)

Website:

<http://www.qwad-project.eu/>

Running time: 2013-01-01 - 2015-12-31

Quantum technologies promise to revolutionise our digital world providing security in communications and solutions for what have been thought of as unsolvable computational problems. The project QWAD introduces the technology of laser-written integrated optics, a powerful new tool for next generation quantum communications and computing, solving critical problems in terms of scalability and reliability. This disruptive photonic technology will speed up the evolution from lab systems to real world applications.

Our consortium will target three main outcomes:

- 1) Fabricate laser-written waveguides in highly integrated three dimensional structures to generate and to manipulate both path- and polarization entangled photonic qubits.
- 2) Implement large integrated circuits to perform scalable quantum logic operations and quantum simulation of many-body dynamics.
- 3) Design dedicated waveguide structures for fully integrated quantum key exchange and for quantum enhanced sensing in application ready prototypes.

The project benefits from the outstanding expertise of consortium members who have pioneered photonic and quantum information technologies over the past decades. The development of laser-written waveguide structures will allow extraordinary progress in terms of miniaturization and scalability while maintaining incomparable stability and durability. Key advances in quantum ICT will exploit the 3D waveguide geometries and other innovations to produce tailored quantum simulators and photonic quantum computer nodes. The development of novel ready-made quantum devices within QWAD will open new doors for innovative chip based quantum key exchange components and unrivalled efficiency and sensitivity Lab-on-a-chip devices.

- [EC - FP7](#)
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