



FRAUNHOFER INSTITUTE FOR APPLIED OPTICS AND PRECISION ENGINEERING IOF
FRAUNHOFER INSTITUTE FOR PHYSICAL MEASUREMENT TECHNIQUES IPM

PRESS RELEASE

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QUILT Autumn School “Quantum-Enhanced Imaging and Spectroscopy”

Within the Fraunhofer Lighthouse Project QUILT (Quantum Methods for Advanced Imaging Solutions), the Fraunhofer Institute for Applied Optics and Precision Engineering IOF from Jena, Germany, together with the Fraunhofer Institute for Physical Measurement Techniques IPM from Freiburg, Germany, will organize an Autumn School on Quantum-Enhanced Imaging & Spectroscopy at the Physikzentrum Bad Honnef, from September 9-12, 2018.

In recent years, important milestones have been reached in quantum science with the generation, manipulation of tailor-made quantum states and their exploitation for communications, computing, simulation and sensing/metrology. Correlated or entangled photons generated far from degeneracy may open up new pathways for imaging and sensing applications across the electromagnetic spectrum away from the “silicon range”.

For this year’s Autumn School on “Quantum-Enhanced Imaging and Spectroscopy” we have invited scientists from the leading research groups in the field as lecturers. The convention at the Physikzentrum shall create an opportunity to get first-hand information on current trends and to discuss fundamental and applied aspects in the fields of sources, methods and applications. To this end, the Autumn school brings together the QUILT community and invites interested parties from industry and research. The schedule features lectures on Quantum Imaging topics which cover both basic aspects as well as current research in the field, and includes ample time for lively discussions.

Event

Organizer: Fraunhofer Gesellschaft (IOF/IPM)

Time: Sunday, Sept. 9 (afternoon) – to Wednesday, Sept. 12, after lunch

Location: Physikzentrum Bad Honnef, Germany

Registration & Information: <https://www.iof.fraunhofer.de/quilt>

Editorial Notes

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Fraunhofer Lighthouse Project QUILT

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The QUILT consortium combines world-renowned expertise in quantum physical fundamental research with both excellence in applied science and engineering as well as mature technology platforms. As such, it aims at identifying so-called quantum benefits in imaging and spectroscopy with a focus on application scenarios. These efforts relate to the three specific fields of Short-Wave Imaging (UV-Imaging), Ghost Imaging and Mid-Infrared Spectroscopy / Imaging, as well as complementary enabling Core Technologies.



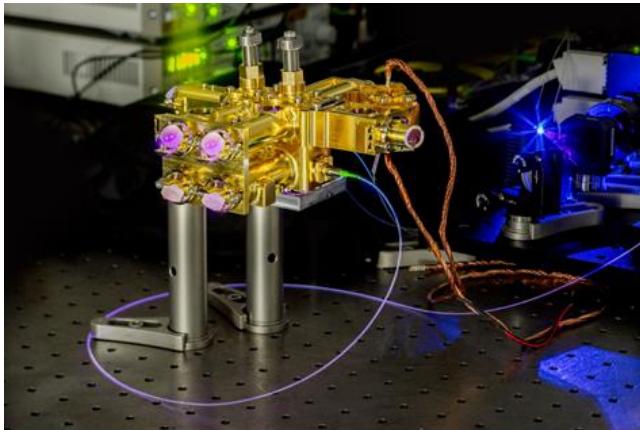
The quantum benefits considered rely on the peculiar quantum nature of entangled photon pairs. These include the possibility to spectrally separate photons used for interaction with the sample and those detected by a sensor, superior non-classical limits of the signal-to-noise ratio (the so-called Heisenberg-Limit) as well as the ability to “see through” scattering media by exploiting the correlation intrinsic to entanglement. Several experiments to specifically demonstrate the unique capabilities of Quantum Imaging Systems are planned during the QUILT project.

QUILT aims at serving as a connecting link between Science and Industry in the fast-growing domain of Quantum Imaging. The project draws from the exceptional portfolios of competences of several German Fraunhofer Institutes: IOF (Applied Optics and Precision Engineering, Jena), IPM (Physical Measurement Techniques, Freiburg), IOSB (Optronics, System Technologies and Image Exploitation, Karlsruhe), IMS (Microelectronic Circuits and Systems, Duisburg), ILT (Laser Technology, Aachen), ITWM (Industrial Mathematics, Kaiserslautern). Current association partners of QUILT include external research institutes, such as the Institute of Quantum Optics and Quantum Information (IQOQI) Vienna of the Austrian Academy of Sciences (ÖAW, Prof. Zeilinger), the Max Planck Institute for the Science of Light (MPG MPL, Prof. Leuchs), the Humboldt-Universität zu Berlin (Dr. Ramelow), while being locally embedded and linked to members of the Center of Excellence in Photonics in Jena.

QUILT is supported as a Fraunhofer LIGHTHOUSE PROJECT.
<http://s.fhg.de/fraunhofer-leitprojekt-quilt-pressemitteilung>



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Stable polarization entangled photon source for quantum key distribution. (©Fraunhofer IOF)



Source of entangled photons: spontaneous parametric down conversion in a non-linear crystal.
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Organization Team

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