



Program and Abstract Book

1. International Symposium on

Single Photon based Quantum Technologies

Berlin, Germany
May 30 - June 1, 2018



PICOQUANT

Program

Wednesday, May 30

- 08:00 - 09:00 Registration and collection of symposium material
- 09:00 - 09:15 Opening Remarks by Andreas Bültner, Berlin, Germany
- 09:15 - 09:45 **Jürgen Mlynek, Berlin, Germany (Opening Talk, Invited Speaker)**
The second quantum revolution -
The EU flagship on quantum technologies
- Session: Quantum Information Processing Chair: Jürgen Mlynek
- 09:45 - 10:15 **Ian Walmsley, Oxford, United Kingdom (Invited Talk)**
Photonic quantum networks: a ubiquitous platform for
quantum technologies
- 10:15 - 10:35 **Michał Karpiński, Warszawa, Poland**
Spectral manipulation of quantum light by complex temporal
phase modulation
- 10:35 - 10:55 **Kristoffer Joanesarson, Kgs. Lyngby, Denmark (Student Award)**
Single and two-photon switching in 1D waveguides with Fano interference
- 10:55 - 11:30 COFFEE BREAK
- Session: Single Photon Detection & Manipulation Chair: Ian Walmsley
- 11:30 - 12:00 **Wolfram Pernice, Münster, Germany (Invited Talk)**
Waveguide integrated single photon detectors
- 12:00 - 12:20 **Josef Hloušek, Olomouc, Czech Republic (Student Award)**
High-fidelity photon-number-resolving detector and photon-statistics
measurement
- 12:20 - 12:40 **Martin A. Wolff, Münster, Germany (Student Award)**
Towards High-Tc Superconducting Nanowire Single Photon Detectors
- 12:40 - 13:00 **Naomi Holland, Oxford, United Kingdom (Student Award)**
Optical Tweezers for Neutral Atoms: The Key to a Reliable
Atom-Photon Quantum Interface
- 13:00 - 14:30 LUNCH BREAK

Session: Quantum Metrology

Chair: Wolfram Pernice

- 14:30 - 15:00 **Ivo Degiovanni, Torino, Italy (Invited Talk)**
Quantum Metrology vs. Quantum Enhanced Measurements
(with Photons)
- 15:00 - 15:20 **Elena Losero, Torino, Italy (Student Award)**
Quantum enhanced absorption measurement with twin beams
- 15:20 - 15:40 **Marco Lopez, Braunschweig, Germany**
The absolute photon flux of a nitrogen vacancy center based
single-photon
- 15:40 - 16:00 **Ivo Straka, Olomouc, Czech Republic (Student Award)**
Generator of arbitrary classical photon statistics
- 16:00 - 16:35 COFFEE BREAK

Session: Entanglement

Chair: Ivo Degiovanni

- 16:35 - 17:05 **Ronald Hanson, Delft, Netherlands (Invited Talk)**
The dawn of quantum networks
- 17:05 - 17:25 **Axel Kuhn, Oxford, United Kingdom**
Quantum Logic and Photon Steering with Single Cavity Photons
in Integrated Photonic Circuits
- 17:25 - 17:45 **Kaisa Laiho, Berlin, Germany**
Precise characterization of Bragg-Reflection Waveguides for producing
versatile polarization-entangled states
- 17:45 - 18:05 **Thomas Barrett, Oxford, United Kingdom (Student Award)**
Polarised Single-Photons from a Cavity-Enhanced Atom-Light Interface
in Photonic Quantum Networks
- 18:30 - ... WELCOME RECEPTION

Thursday, May 31

Session: Single Photon Sources I

Chair: Marco Lucamarini

- 09:00 - 09:30 **David Gershoni**, Haifa, Israel (*Invited Talk*)
Deterministic generation of a cluster state of entangled photons,
using semiconductor quantum dots
- 09:30 - 09:50 **Tobias Heindel**, Berlin, Germany
A Bright Triggered Twin-Photon Source in the Solid State
- 09:50 - 10:10 **Kai Müller**, Garching, Germany
Generation of single-photon and two-photon pulses from a quantum
two-level system
- 10:10 - 10:30 **Jun HE**, Tai Yuan, China
852nm Triggered Single Photons from a Single Cesium Atom Trapped
in a Microscopic Optical Tweezer with Magic Wavelength
- 10:30 - 11:05 COFFEE BREAK

Session: Quantum Communications & QKD

Chair: Christine Silberhorn

- 11:05 - 11:35 **Andrew Shields**, represented by **Marco Lucamarini**, Cambridge,
United Kingdom (*Invited Talk*) Quantum Communication Networks
- 11:35 - 11:55 **Chris Müller**, Berlin, Germany (*Student Award*)
Quantum interference with frequency-locked dissimilar light sources
- 11:55 - 12:15 **Karolina Sedziak**, Torun, Poland (*Student Award*)
Experimental demonstration of remote temporal wavepacket narrowing
- 12:15 - 12:35 **Janik Wolters**, Basel, Switzerland
Towards heterogeneous quantum networks with solid state single
photon sources and atomic quantum memories
- 12:35 - 12:45 GROUP PICTURE
- 12:45 - 14:15 LUNCH BREAK

Session: Integrated Photonic Circuits

Chair: David Gershoni

- 14:15 - 14:45 **Christine Silberhorn**, Paderborn, Germany (*Invited Talk*)
Non-linear integrated quantum optics
- 14:45 - 15:05 **Peter Schnauber**, Berlin, Germany (*Student Award*)
Deterministic integration of quantum dots into on-chip MMI couplers via
insitu electron beam lithography
- 15:05 - 15:25 **Ekkehart Schmidt**, Karlsruhe, Germany (*Student Award*)
Superconducting nanowire single-photon detectors on GaAs with
suppressed parasitic counts
- 15:25 - 15:45 **Florent Baboux**, Paris, France
III-V integrated photonic circuits for the generation and manipulation
of quantum states of light
- 15:45 - 16:00 COFFEE BREAK
- 16:00 - 18:30 POSTER SESSION and PRODUCT DEMONSTRATION
16:00 – 17:15 odd poster numbers
17:15 – 18:30 even poster numbers

Friday June 1

Session: Quantum Sensing

Chair: Mark Fox

- 09:00 - 09:30 **Ronald Walsworth**, Cambridge, United States (*Invited Talk*)
Magnetic sensing using quantum defects in diamond
- 09:30 - 09:50 **Nati Aharon**, Jerusalem, Israel
High resolution sensing of high-frequency fields with continuous
dynamical decoupling
- 09:50 - 10:10 **Wolfgang Elsässer**, Darmstadt, Germany
Ghost Modalities with thermal light emitted from a broad-band
superluminescent diode light source: ghost imaging, ghost spectroscopy
and ghost polarimetry
- 10:10 - 10:30 **Changhyoup Lee**, Karlsruhe, Germany
Experimental studies of quantum plasmonic sensing
- 10:30 - 11:05 COFFEE BREAK

Session: Single Photon Sources II

Chair: Varun Verma

- 11:05 - 11:35 **Mark Fox**, *Sheffield, United Kingdom (Invited Talk)*
On-chip quantum photonics with integrated quantum-dot single-photon sources
- 11:35 - 11:55 **Amir Tavala**, *Wien, Austria (Student Award)*
Quantum optical source for probing retina response to single photons
- 11:55 - 12:15 **Hamza Abudayyeh**, *Jerusalem, Israel (Student Award)*
Purification of single photons by temporal heralding of quantum dot sources
- 12:15 - 12:35 **Anna Musiał**, *Wrocław, Poland*
Single-photon generation from GaAs-based deterministic QD-mesas at telecom wavelengths.
- 12:35 - 14:05 LUNCH BREAK

Session: Single Photon Detection

Chair: Ronald Walsworth

- 14:05 - 14:35 **Varun Verma**, *Boulder, United States (Invited Talk)*
Progress in single photon imaging from the UV to the mid infrared using superconducting nanowire detectors
- 14:35 - 14:55 **Josef Blazej**, *Prague, Czech Republic*
Photon counting instrumentation optimized for metrology applications
- 14:55 - 15:15 **Tim Bartley**, *Paderborn, Germany*
Cryogenic integrated optics in lithium niobate
- 15:15 - 15:35 **Gourgues Ronan**, *Delft, Netherlands*
Toward the integration of photonic circuit with a single photon source and superconducting nanowire detectors
- 15:35 - 15:45 STUDENT AWARD PRESENTATION
- 15:45 END OF SYMPOSIUM

Poster presentations

(in alphabetical order)

Presenter	Presentation time	Poster #	Title
Aharon, Nati	16:00 – 17:15	P1	Heisenberg-scaling measurement of the single-photon Kerr non-linearity using mixed states
Alén, Benito	17:15 – 18:30	P2	Monolithic Quantum Light Source with Hybrid Pumping
Averchenko, Valentin	16:00 – 17:15	P3	Off-resonant effects in a cavity-assisted nonlinear generation of photon pairs
Böhm, Florian	17:15 – 18:30	P4	Integrated Photonic Platforms for Efficient Collection of Single Photons from Solid-State Quantum Emitters
Böhm, Florian	16:00 – 17:15	P5	Integrated Microresonator-Stabilized Light Source for (Quantum-) metrology
Denning, Emil V.	17:15 – 18:30	P6	Quantum electrodynamics in the transition between waveguide and nanocavity
Doherty, Thomas H	16:00 – 17:15	P7	Design and Fabrication of Versatile Optical Cavities for Quantum Networks
Fuchs, Philipp	17:15 – 18:30	P8	Optical Antennas for Color Centers in Diamond
Gajewski, Andrzej	16:00 – 17:15	P9	Analysis of nanoantennas for enhancement of entangled two-photon emission from a quantum dot.
Gieysztor, Maria	17:15 – 18:30	P10	Time-resolved analysis of the NV centers' fluorescence dynamics
Handel, Peter H	16:00 – 17:15	P11	Quantum Theory of 1/f Frequency Fluctuations Part 1- De-Coherence as the Cause of Fundamental 1/f Noise -
Handel, Peter H	17:15 – 18:30	P12	Quantum 1/f Optimization of Resonant & Nonresonant Sensors - THE EXAMPLE OF QUANTUM WELL INFRARED DETECTORS
Helgers, Paul L. J.	16:00 – 17:15	P13	Acoustic charge and electron-spin transport in GaAs quantum-wires
Holewa, Pawel	17:15 – 18:30	P14	Effect of temperature on emission from deterministic quantum dot-mesas in the 1.3 μm range

Presenter	Presentation time	Poster #	Title
Korneev, Alexander	16:00 – 17:15	P15	Practical single-photon detectors made of micron-wide superconducting strip
Lasota, Mikolaj	17:15 – 18:30	P16	Optimizing SPDC photon pairs for quantum communication applications
López, Marco	16:00 – 17:15	P17	High efficient setup for filtering the single-photon spectral emission of InGaAs quantum dots
Misiaszek, Marta	17:15 – 18:30	P18	Measuring dispersion in nonlinear crystals beyond detectors' spectral range
Mohammed, Marwan	16:00 – 17:15	P19	A fibre-tip Fabry-Pérot cavity for deterministic, strong atom-photon interactions
Nelz, Richard	17:15 – 18:30	P20	Towards Energy Transfer-based Sensing and Imaging using Color Centers in Single-Crystal Diamond
Rödiger, Jasper	16:00 – 17:15	P21	Time-Frequency QKD over Free-Space and Fiber Channels
Ghamsari, Morteza Sasani	17:15 – 18:30	P22	Single photon emission of ZnO nanocrystals: New progress
Semenov, Alexander	16:00 – 17:15	P23	A possibility to use low-volume Kinetic Inductance Detector to detect single photons of GHz frequency range
Sontheimer, Bernd	17:15 – 18:30	P24	Second order correlation measurements of quantum emitters in hexagonal boron nitride and their implications on the underlying level system
Splett, Erika	16:00 – 17:15	P25	Quantum Theory of 1/f Frequency Fluctuations Part 2: Quantum 1/f Optimization of Quartz Resonators, Electronics, MEMS, Clocks, Piezotransducers, and Resonant Sensors
Srocka, Nicole	17:15 – 18:30	P26	Quantum dot-microlenses for single-photon sources operating at telecom wavelength
Szlachetka, Jakub	16:00 – 17:15	P27	Nanostructural beam splitter
Tokunaga, Yuuki	17:15 – 18:30	P28	Single photon generation using nano-fiber cavity-QED systems

Presenter	Presentation time	Poster #	Title
Veilande, Rita	16:00 – 17:15	P29	Is the photon a soliton?
Warburton, Ryan	17:15 – 18:30	P30	Applications of time-correlated single-photon counting cameras
Wu, Junyi	16:00 – 17:15	P31	Effects of photon losses on the accessible quantum Fisher information obtained by photon number resolving detectors
Yuen, Ben	17:15 – 18:30	P32	Atoms dressed by a multimode field
Zienert, Steffen	16:00 – 17:15	P33	Generation and investigations of super-thermal Light

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