

CONFERENCE PROGRAMM

ICQOQI'2017

Monday, November 20

11:00 Start of Registration

12:00 – 13:30 Registration and Poster Session

13:30 – 16:00 Mo20C: Plenary session (Chairman: *S. Kilin*)

F. Jelezko “Light matter quantum interface based on diamond colour centres”

M. Bellini “Conditional quantum state engineering, entanglement generation, and emulation of optical nonlinearities”

A. Kuzmich “Quantum optics with Rydberg atoms confined in state-insensitive optical traps”

16:00 – 16:30 Coffee break

16:30 – 18:00 Mo20D: Quantum interference (Chairman: *N. Korolkova*)

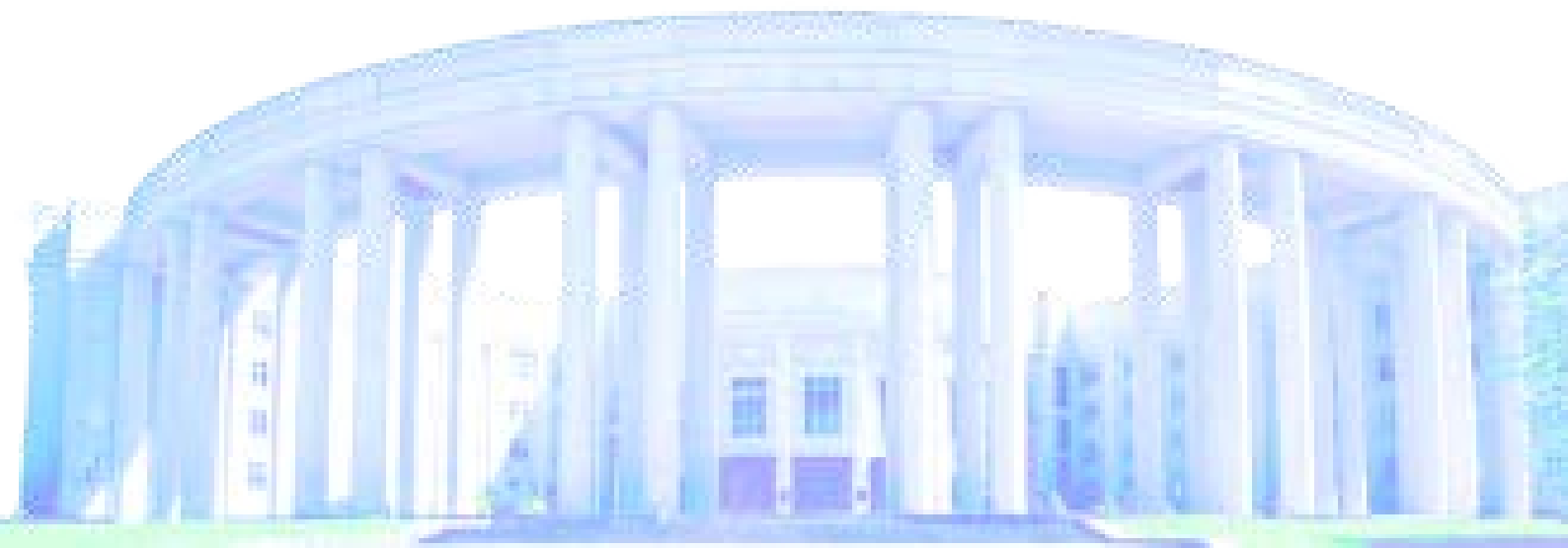
M. S. Kim “Nonclassicalities in multi photon interferometry”

S. Kulik “Quantum Interference: Spectroscopy Applications”

A. Sinatra “Mesoscopic superposition in a bimodal Bose-Einstein condensate: influence of decoherence and finite temperature”

18:00 – 19:00 Poster session (continuation)

19:30 – 21:00 WELCOME PARTY



Tuesday, November 21

9:00 – 11:00 Tu21A: Morning parallel session

Tu21A(A): NV-centers for sensing (Chairman: *F. Jelezko*)

Q. Li “Nanodiamond based hybrid quantum biosensors”

A. Huck “Pump Enhanced Continuous-Wave Magnetometry using Nitrogen-Vacancy Ensembles”

P. Olivero “Recent developments on optically active centers in diamond for quantum optics and quantum-enhanced sensing”

T. Debuisschert “Magnetic field sensors with nitrogen-vacancy centers in diamond”

Tu21A(B): Fundamentals of quantum theory (Chairman: *L. Sanchez-Soto*)

M. Kus “Randomness in no-signaling theories”

P.P. Crepin “Casimir-Polder shifts on quantum levitation states”

M. Malinowski “Quantum contextuality tests with a trapped-ion qutrit”

Tu21A(C): Nanostructures (Chairman: *M. Fedorov*)

V. Balykin “Nanolaser based on plasmonic crystal”

Yu. Vainer “Far-field optical microscopy with ultra-high spatial resolution and improved sensitivity”

S. Arakelian “Macroscopic quantum states in laser-induced topological nanostructures: electrophysics of thin films and tendency to superconductivity”

V. Temnov “Towards quantum magneto-photonics with metal-ferromagnet multilayers and ultrashort laser pulses”

11:00 – 11:30 Coffee break

11:30 – 13:00 Tu21B: Plenary session (Chairman: *V. Balykin*)

J.-F. Roch “NV color centers in a diamond anvil cell for high-pressure magnetic measurements”

A. Leitenstorfer “Subcycle Quantum Physics of Photons and Electrons”

13:00 – 14:00 Lunch

14:00 – 16:00 Tu21C: Afternoon parallel session

Tu21C(A): Quantum state engineering and correlations (Chairman: *M. Kus*)

J. Piilo “Remote polarization entanglement generation by local dephasing and frequency upconversion”

Y.S. Ra “A Single-Photon Subtractor for Multimode Quantum States”

F. Koenig “Correlated photon emission from a moving refractive index front”

V. Dodonov “New uncertainty relations for entangled observables”

Tu21C(B): Spin-qubits in diamond (Chairman: *V. Klimov*)

A. Gali “Theory and application of dynamic optical spin polarization for solid state qubits”

M. Nesladek “Spin physics and electronic transitions on NV centre in diamond: realization of electrically read single NV qubits”

W. Gawlik “Microwave hole-burning spectroscopy of NV- color centers in diamond”

A. Alkauskas “Towards a room-temperature spin quantum bus in diamond via electron photoionization, transport, and capture”

Tu21C(C): Scattering and communication (Chairman: *D. Horoshko*)

N. Korolkova “Practical multipartite secure quantum communication using homodyne detection”

V. Gritsev “Photons in one-dimensional structures”

O. Skoromnik “Quantum effects in strong field QED”

V. Shatokhin “Potential of adaptive optics to counteract entanglement degradation of twisted photons in atmospheric turbulence”

16:00 – 16:30 Coffee break

16:30 – 18:25 Tu21D: Evening parallel session

Tu21D(A): States of light and applications (Chairman: *J. von Zanthier*)

M. Fedorov “Anomalously strong broadening of single-particle distributions in transverse momenta of noncollinear biphoton states”

V. Klimov “Optical properties of nano-waveguide with nontrivial topology of reciprocal space”

D. Sychev “Interfacing discrete- and continuous-variable encodings in quantum optics”

F. Krumm “Time-dependent quantum effects in phase space”

Tu21D(B): Diamond, silicon, etc. (Chairman: *A. Gali*)

A. Zheltikov “Fiber-optic quantum thermometry with a nitrogen–vacancy center in diamond”

A. Nizovtsev “Non-flipping ^{13}C spins in NV diamond: Hyperfine and Spatial Characteristics by DFT Simulation of the $\text{C}_{510}[\text{NV}]\text{H}_{252}$ Cluster”

L. Wilson “Electrical control of nonlinear quantum optics, on-chip single photon generation and reconfigurable device operation for semiconductor integrated quantum optical circuits”

R. Cernansky “Performance characterization of a non-classical source in SiN photonic device at 785nm”

Tu21D(C): Many-body systems and quantum networks (Chairman: *D. Matsukevich*)

T. Barthel “Entanglement and computational complexity for 1D quantum systems at finite temperatures”

V. Parigi “Multimode resources based on optical frequency combs and implementation of quantum complex network”

V. Boyer “Simulating quantum energy transport in a noisy environment with cold atoms”

N. Ilin “Parametrization of constrained and unconstrained sets of quantum states”

19:00 – 22:00 CONFERENCE DINNER

Wednesday, November 22

9:00 – 11:00 We22A: Morning parallel session I

We22A(A): Quantum imaging and tomography (Chairman: *V. Dodonov*)

J. von Zanthier “Quantum Imaging with Incoherent Light”

Y.S. Teo “Adaptive compressed sensing without a priori information”

A. Mikhalychev “Quantum correlations for super-resolving quantum imaging”

L. Motka “Efficient tomography with unknown detectors”

D. Horoshko “Quantum field of view in temporal imaging”

We22A(B): Cold atoms (Chairman: *A. Kuzmich*)

K. Jachymski “Three-body interaction of slow-light Rydberg polaritons”

T. Wellens “Microscopic theory of nonlinear light transport in a dilute and cold atomic cloud”

P. Bienias “Strongly interacting Rydberg slow light polaritons”

Ig. Sokolov “Influence of electrostatic field on optical properties of dense and cold atomic ensembles”

We22A(C): Quantum communication (Chairman: *V. Shatokhin*)

J. Neergaard-Nielsen “Squeezing and photon correlation measurements on a telecom-wavelength OPO”

A. Semenov “Quantum Optics in the Turbulent Atmosphere”

S. Takeda “Optical hybrid quantum teleportation and its application to large-scale quantum computing”

M. Takeoka “Entanglement distillation and quantum key distribution in broadcast quantum channels”

11:00 – 11:30 Coffee break

11:30 – 13:00 We22B: Morning parallel session II

We22B(A): Quantum metrology (Chairman: Z. Hradil)

- L. Sanchez-Soto** “Quantum metrology at the limit with extremal Majorana constellations”
S. Gleyzes “Quantum metrology with Rydberg atoms”
L. Mancino “Experimental ancilla-assisted phase-estimation in a noisy channel”

We22B(B): Sources and detectors (Chairman: A. Mikhailychev)

- A. Stefanov** “Coincidence Detection of Spatially Correlated Photon Pairs with a Novel Type of Monolithic Time-Resolving Detector Array”
D. Boiko “On a question about quantumness in superradiance”
G. Bulgarini “Photon counting with near unity efficiency and ultra-high time resolution using superconducting nanowire detectors”

We22B(C): Quantum computers (Chairman: T. Barthel)

- L. Tian** “Improving the adiabaticity of adiabatic quantum algorithms with unknown energy spectrum”
V. Akulin “Universal quantum processor already exists and just waits for the proper programming”
A. Sawicki “Criteria for universality of quantum gates”

13:00 – 14:00 Lunch

14:00 – 16:30 We22C: Afternoon session

14:00 – 15:00 Afternoon parallel session

We22C(A): Quantum optomechanics (Chairman: Yu. Ozhigov)

- A. Rakhubovsky** “Quantum Information Processing with Pulsed Cavity Optomechanics”
E. Sachkou “Probing the dynamics of two dimensional superfluids with cavity optomechanics”

We22C(B): Nanostructures and quantum memory (Chairman: V. Akulin)

- B. Ham** “Collective atom phase control to doubly rephased photon echoes for ultralong quantum memories”
N. Sobolev “Radiation technology of perpendicular magnetic tunnel junctions”

We22C(C): Nonclassicality and interference (Chairman: A. Buchleitner)

- M. Cheneau** “A two-particle, four-mode interferometer for atoms”
K. Katamadze “Experimental study of quadrature distributions of multi-photon subtracted thermal states”

15:00 – 16:30 Afternoon plenary session (Chairman: M. Bellini)

- Z. Hradil** “Quantum Fisher information and the resolution beyond the Rayleigh limit”
G. Leuchs “Focusing light – and coupling to a sub wavelength absorber”

17:00 – 18:00 Dinner

19:00 – 22:00 THEATRE VISIT (BALLET)

Thursday, November 23

9:00 – 11:00 Th23A: Morning parallel session

Th23A(A): Quantum state engineering and entanglement (Chairman: *V. Gritsev*)

A. Isar "Generation of quantum correlations in Gaussian open quantum systems"

M. Hebenstreit "The entanglement hierarchy of $2 \times m \times n$ systems"

S. Filippov "Ultimate entanglement robustness against general local noises"

P. Kolenderski "On photonic spectral entanglement improving quantum communication"

T. Maciazek "Asymptotic properties of entanglement polytopes for large number of qubits"

Th23A(B): Collective effects (Chairman: *Yu. Vainer*)

I. Osad'ko "Entanglement in electron-nuclear spin system as a cause of dependence of dephasing rate $1/T_2$ on intensity in the optical Bloch equations"

V. Porozova "Light scattering from a quantum degenerate bosonic atomic gas"

V. Yudson "Dipole interaction effects and dark states in collective fluorescence"

M. Gladush "Analytical solutions describing spectroscopic properties of cooperative ensembles in dielectrics"

11:00 – 11:30 Coffee break

11:30 – 13:00 Th23B: Plenary session (Chairman: *G. Leuchs*)

A. Kuhn "Boson or Fermion? Quantum Confusion with cavity photons"

A. Buchleitner "Quantum dynamics on networks - the interplay of structure, disorder, and statistics"

13:00 – 14:00 Lunch

14:00 – 16:00 Th23C: Afternoon parallel session

Th23C(A): Optical lattices and trapped atoms (Chairman: *S. Arakelian*)

D. Matsukevich "Trilinear Hamiltonian with trapped ions and its applications"

D. Ivanov "Quantum control of Bose-Einstein condensates in blue-detuned optical lattices"

A. Alberti "Fast optimal transport of neutral atoms in state-dependent optical lattices"

G. Dufour "Signatures of (in)distinguishability in many-boson dynamics"

Th23C(B): Nanostructures and photons (Chairman: *Ig. Sokolov*)

S. Maksimenko "Generation of THz Electromagnetic Waves in Carbon Nanotubes and Graphene"

S. Pokutnyi "Excitonic Quasimolecules in Nanoheterosystems Containing Semiconductor and Dielectric Quantum Dots"

N. Strekal "Formation of the hot spots by CdSe/ZnS nanocrystals and metal nanoparticles and their detection by near-field optical microscopy and far-field fluorescence"

A. Leonov "Spontaneous emission in a quantum system driven by the resonant field beyond the rotating wave approximation"

16:00 – 16:30 Coffee break

16:30 – 18:20 Th23D: Evening parallel session

**Th23D(A): Hybrid interfaces (Chairman:
A. Nizovtsev)**

A. Akimov “Coupling of NV nanodiamonds to optical fibers”

J. Ishi-Hayase “Improvement of photon-echo generation efficiency by adiabatic rapid passages with a pair of chirped pulses in an inhomogeneous quantum dot ensemble”

S.Y. Lan “Atom interferometry inside a hollow-core photonic crystal fiber”

V. Tomilin “Spectral and statistical properties of photoemissions from atomic ensembles in a cat-state field”

Th23D(B): Quantum states and entanglement (Chairman: D. Mogilevtsev)

Yu. Ozhigov (plenary) “Dark states and energy transformation in two-level atoms”

V. Gerdt “Description of the entanglement space in terms of polynomial invariants: algorithmic and computational aspects”

A. Manukhova “Noiseless converting of a quantum field shape for multipartite entangled state generation”

B. Veklenko “The Photons and their Bound States”

18:30 Conference Closing