
Graduiertenseminar zu aktuellen Themen der Quantenoptik und Quanteninformation, "Control-Q" AGs Becher, Morigi, Eschner, Wilhelm

Bisherige Vortragende und Themen / Previous Speakers and Topics

2016

- **Wednesday, 7th December, Nadezhda Kukharchyk (AG Bushev):** "Properties of Er-ions in ${}^7\text{LiYF}_4$ crystals "
- **Wednesday, 23rd November, Magdalena Stobinska (Guest AG Morigi):** "Shall we go for a quantum walk? Divide et impera in quantum world- mastering the complexity and the uncomputable"
- **Friday, 18th November, Eilon Poem (Guest AG Becher):** "Towards room-temperature, ultra-fast, coherent light-matter interaction with diamond defects"
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- **Wednesday, 16th November, Ilja Gerhardt (Guest AG Becher):** "The power of image representation in quantum optics"
- **Wednesday, 9th November, Elie Assemat (AG Wilhelm-Mauch):** "Quantum Brachistochrone Curves as Geodesics: Obtaining Accurate Minimum-Time Protocols for the Control of Quantum Systems", Phys. Rev. Lett. 114, 170501, "Experimental Time-Optimal Universal Control of Spin Qubits in Solids", Phys. Rev. Lett. 117, 170501
- **Wednesday, 12th October, Pascal Eich (AG Eschner):** "Hong–Ou–Mandel interference of two phonons in trapped ions", Nature, 527, 74-77 (2015)
- **Wednesday, 21st September, Philipp Fuchs (AG Becher):** "Single-Photon Switching and Entanglement of Solid-State Qubits in an Integrated Nanophotonic System", arXiv:1608.05147
- **Wednesday, 6th June, Amit Kumar Pal (Guest AG Eschner):** "Necessarily transient quantum refrigerator", arXiv:1606.06985
- **Wednesday, 22nd June, Shai Machnes (AG Wilhelm-Mauch):** "Tunable, Flexible and Efficient Optimization of Control Pulses for Quantum Systems"
- **Wednesday, 8th June, Philipp Müller (AG Eschner):** "Time-resolved Scattering of a Single Photon by a Single Atom", arXiv:1604.08020
- **Wednesday, 18th May, Oxana Mishina (AG Morigi):** "Observation of Gravitational Waves from a Binary Black Hole Merger", PRL, 116.061102

- **Wednesday, 11th May, Ralf Betzholz (AG Morigi):** "Engineering Long-Lived Collective Dark States in Spin Ensembles", arXiv:1512.00248
- **Wednesday 20th April, Himadri Chatterjee (AG Becher):** "Quantum metrology enhanced by repetitive quantum error correction", arXiv:1602.07144
- **Wednesday 30th March, Ettore Bernadi (AG Neu):** "Single Defect Center Scanning Near-Field Optical Microscopy on Graphene", Nano Lett. 2013, 13, 3152−3156
- **Wednesday 16th March, Peter Schuhmacher (AG Wilhelm-Mauch):** "A quantum annealing architecture with all-to-all connectivity from local interactions", Science Advances, Vol. 1, No. 9, 1500838
- **Wednesday 9th March, Magdalena Zych (Guest, University of Brisbane):** "Connection of General relativity and quantum mechanics"
- **Wednesday 27th January, Luigi Gianelli:** "Photonic Quantum Circuits with Time Delays" arXiv:1510.04646
- **Wednesday 13th January, Hannes Gothe:** "Measurements on the reality of the wavefunction", Nature Physics 11,249–254 (2015)

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- **Wednesday 9th December, Frank Wilhelm-Mauch:** "Training Schrödinger's cat: Quantum optimal control"
- **Wednesday 23rd November, Michał Karpiński (Guest AG Becher)** "Deterministic electro-optic spectral manipulation of quantum light"
- **Wednesday 21th October, Thomas Jung (AG Becher)** "Experimental loophole-free violation of a Bell inequality using entangled electron spins separated by 1.3 km", B. Hensen et al., arxiv 1508.05949v1.
- Wednesday 7th October, **Susanne Blum (AG Morigi)** 'Optimal light storage in atomic vapor', Philips et al. PRA 78 023801 (2008) and PRL 98 243602 (2007).
- Wednesday 30th September, **Matthias Bock (AG Becher)** 'Quantum storage of entangled telecom-wavelength photons in an erbium-doped optical fibre'. E. Saglamyrek et al. Nature Phot. 9 (83-87).
- Monday 31st August, **Marco Capelli, University of Torino, (guest AG Becher)** 'Quantum-optical characterisation of nitrogen-vacancy center in artificial diamond for sensing applications'.
- Wednesday July 22nd, **Nishant Dogra (ETH Zürich, guest AG Morigi)** 'Bose-Hubbard model with cavity-mediated long-range interactions: theory and experiment'

- Wednesday 8th July, **Matthias Kreis** (AG Eschner). 'High-fidelity preparation, gates, memory and readout of a trapped-ion quantum bit', T. P. Harty, et al, PRL 113, 220501 (2014).
- Wednesday 17th June, **Elie Assemat** (AG Wilhelm-Mauch). "Simulating Hamiltonian Dynamics with a Truncated Taylor Series", PRL 114, 090502 (2015),
- Wednesday 3rd June, **Stefan Schütz**, AG Morigi. 'Phase diagram for injection locking a superradiant laser' Kevin C. Cox, Joshua M. Weiner, and James K. Thompson. Phys. Rev. A 90, 053845 (2014)
- Wednesday 20th May, **Jonas Becker**, AG Becher. 'Chiral nanophotonic waveguide interface based on spin-orbit interaction of light', by Petersen et al. Science Vol. 346 no. 6205 pp. 67-71 (2014).
- Wednesday 13th May* ,**Felix Motzoi**, AG Wilhelm-Mauch. Demonstration of a quantum error detection code using a square lattice of four superconducting qubits. Nat. Commun. 6, 6979.
- Wednesday 22nd April, **Luigi Giannelli**, AG Morigi. 'Injection Locking of a Trapped-Ion Phonon Laser', Phys. Rev. Lett. 105, 013004.
- Wednesday 25th February, **Katharina Rojan**, AG Morigi. 'Fractal Energy Spectrum of a Polariton Gas in a Fibonacci Quasiperiodic Potential' D. Tanese et al. PRL 112, 146404 (2014).
- Wednesday 11th February, **Pierre-Luc Dallaire-Demers**, AG Wilhelm-Mauch. BCS-BEC Crossover in the Two-Dimensional Attractive Hubbard Model. Tatsuya Kaneko, Y. Ohta (<http://arxiv.org/abs/1308.0664>)
- Wednesday 28th January, **Sarah Lindner**, AG Becher. "Optical Antennas" L. Novotny & Niek van Hulst: "Antennas for Light" (Nat. Phot. 10,83(2010)).
- Wednesday 15th January, **S. Fishman** (Technion, Haifa, Guest AG Morigi) "Collapses and revivals of matter waves".

2014

- Wednesday 17th December, **David Petrosyan**, (guest AG Morigi), 'Correlations of Rydberg excitations in optically-driven dissipative atomic ensembles'
- Wednesday 3rd December, **Markku Stenberg** (AG Wilhelm-Mauch) , 'Efficient Algorithm for Optimizing Adaptive Quantum Metrology Processes' . PRL 107, 233601 (2011).
- Wednesday 19th November, **Stephan Kucera** (AG Eschner). 'Nonlinear pi phase shift for single fibre-guided photons interacting with a single resonator-enhanced atom' doi:10.1038/nphoton.2014.253.

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- Wednesday 5th November, **Florian Cartarius**, (AG Morigi). 'Competing Supersolid and Haldane Insulator Phases in the Extended One-Dimensional Bosonic Hubbard Model' G. Batrouni et al. PRL110, 265303 (2013).
 - Friday 31st October, **Michael Hartmann** (Guest AG Wilhelm-Mauch). 'Photons in Networks of Superconducting Circuits'.
 - Wednesday 22nd October, **Olivier Gazzano**, (AG Becher). 'Probing the Dynamics of a Nuclear Spin Bath in Diamond through Time-Resolved Central Spin Magnetometry'.
 - Wednesday 15th October, **Dmitriy Kupriyanov**, St.-Petersburg Pol. Univ. (Guest AG Morigi). 'Quantum interfaces with dense atomic clouds'. Phys. Rev. A 86, 043414
 - Wednesday 24th September, **Bruno Taketani** (AG Wilhelm-Mauch), 'Mapping the optimal route between two quantum states' Weber et al, Nature 511, 570 (2014).
 - Wednesday 16th July, **Karl-Peter Marzlin**, St. Francis Xavier University, Canada, (Guest AG Wilhelm-Mauch).
 - Wednesday 25th June, **Ignacio Wilson-Rae**, **University of York**, (Guest).
 - Wednesday 11th June, **Daniel Egger**, AG Wilhelm-Mauch. 'Qubit architecture with high coherence and fast tunable coupling', arXiv:1402.7367.
 - Wednesday 21th May, **Oxana Mishina**, AG Morigi, 'Memory-assisted measurement-device-independent quantum key distribution' Panayi et al (2014) New J. Phys. 16 043005
 - Wednesday 7th May, **Benjamin Kambs**, (AG Becher). 'Nondestructive Detection of an Optical Photon', by A. Reiserer et al. Science, (2013) Vol. 342 no. 616.
 - Wednesday 9th April, **Per Liebermann**, (AG Wilhelm-Mauch), "Deterministic entanglement of superconducting qubits by parity measurement and feedback". D. Risté et al. Nature 502, 350 (2013).
 - Wednesday 26th February, **Philipp Müller**, (AG J. Eschner). "Demonstration of Weak Measurement Based on Atomic Spontaneous Emission". I. Shomroni et al. PRL 111,023604 (2013).
 - Wednesday 19th February, **Thomás Fogarty**, (AG G. Morigi). "Optically induced structural phase transitions in ion Coulomb crystals". P. Horak et al. PRA 86, 043435 (2012).
 - Wednesday 12th February, **Marc Bienert**, (AG G. Morigi). 'Light scattering in hybrid quantum systems'.
 - Wednesday 15th January, **Alexander Bommer** (AG C. Becher). "Single Ion Coupled to an Optical Fiber Cavity". *Phys. Rev. Lett.* 110, 043003 (2013)

2013

- Wednesday 18th December, **Christian Arenz**, Aberystwyth University, Wales. (guest AG Morigi) . "Control of open quantum systems: Case study of the central spin model".
- Wednesday 11th December: **Britton Plourde**, Syracuse University (visiting Prof. AG Wilhelm-Mauch): Experimental implementation of superconducting qubits"
- Wednesday 4th December: "Design of superconducting qubits and multi-qubit architectures"
- Wednesday 27th November, **Gabriel Hetet**, LPQM / Paris (guest AG Becher) "Single photon interference experiments with trapped ions".
- Wednesday 20th November, **Hannes Gothe**, AG Eschner, "All-Optical Switch and Transistor Gated by One Stored Photon"
<https://www.sciencemag.org/content/341/6147/768>.
- Monday 13th October, **Susanne Blum**, AG Morigi, "Polarized light in safe storage"
- Wednesday 9th October, **Andreas Lenhard**, AG Becher, "Quantum-dot spin-photon entanglement via frequency downconversion to telecom wavelength", Kristiaan De Greve, et al. Nature 491, 421 (2012)".
- Thursday 26th September, **Olivier Gazzano**, Laboratoire de Photonique et de Nanostructures, Marcoussis, France. Guest AG Becher, "Ultrabright solid-state sources of indistinguishable single photons for quantum information processing"
- Friday, 19th July, **Stefan Wißmann**, Universität Freiburg, "Quantum states with maximal memory effects and non-Markovian quantum probes"
- Wednesday, 17th July, **Sebastian Probst**, KIT (guest AG Morigi) "Towards quantum interfaces between optical and microwave photons"
- Wednesday 3rd July, **Anaïs Dréau** (ENS Cachan) Guest AG Becher 'Single shot readout of nuclear spins in diamond'.
- Wednesday 19th June, **Christoph Kurz** , AG Eschner, "Undoing a Quantum Measurement." Schindler et al. DOI:10.1103/PhysRevLett.110.070403
- Wednesday 5th June ,**Tina Müller** Cambridge University, Guest AG Becher, "Optical signatures of a silicon-based spin in diamond"
- Wednesday 22nd May, **Ralf Betzholtz**, AG Morigi, "Nonlinear Quantum Optomechanics via Individual Intrinsic Two-Level Defects"
<http://prl.aps.org/abstract/PRL/v110/i19/e193602>
- Friday 10th May, **Felix Rohde**, PTB Braunschweig, guest AG Eschner, "Characterization of the tuning properties of single-frequency optical frequency synthesizers".

- Wednesday 8th May, **Tanja Mehlstäubler**, guest AG Morigi. "Symmetry Breaking and Topological Defect Formation in Ion Coulomb Crystals wavelenght"
- Wednesday 24th April, **Tracy Northup**, University of Innsbruck, guest AG Morigi.
- Wednesday, 13th March, **Gianluca Giorgi**, AG Morigi. "Observation of coherent many-body Rabi oscillations", by Y. O. Dudin, L. Li, F. Bariani, and A. Kuzmich, Nature Phys. 8, 790 (2012).
- Thursday, 7th March, **Monika Schleier-Smith** (MPQ,LMU), Munich, guest AG Morigi. "Engineering Entanglement from the Top Down: Cavity Spin Squeezing and Beyond"
- Wednesday, 27th February, **Michael Schug**, AG Eschner. "Pinning an Ion with an Intracavity Optical Lattice" <http://prl.aps.org/abstract/PRL/v109/i23/e233005>.
- Thursday, 15th February, **Haggai Landa**. Tel Aviv, AG Morigi's guest. Beyond the Pseudopotential Approximation.
- Wednesday, 6th February, **Luke Govia** , AG Wilhelm-Mauch. "Stabilizing Rabi oscillations in a superconducting qubit using quantum feedback" R. Vijay et al. Nature 490, 77–80. October 2012
- Wednesday, 16th January, **Markku Stenberg**, AG Wilhelm-Mauch. "Surface codes: Towards practical large-scale quantum computation".

2012

- Wednesday , 12th December,2012. **Laura Kipfstuhl**, AG Becher. "Strong coupling between distant photonic nanocavities and its dynamic control" Sato et al. nature photonics 2011,286 (2012).
- Wednesday , 5th December. **Stefan Schütz**. AG Morigi Cavity Cooling Below the Recoil Limit Matthias Wolke et al.Science 337, 75 (2012).
- Wednesday, 28th November, **Pascal Eich**, AG Eschner. "Atom-atom entanglement by single-photon detection". L. Slodička et al <http://arxiv.org/abs/1207.5468> (June 2012).
- Wednesday, 21st November, **Sabrina Maniscalco**, Heriot-Watt University Edinburgh, Guest AG Morigi. "Non-Markovianity as a quantum probe for complex systems and quantum simulators".
- Wednesday, 14th November, **Ron Schujens**, AG Wilhelm-Mauch. "Probing dynamics of an electron-spin ensemble via a superconducting resonator".
- Tuesday, 13th November, **Herwig Ott**, TU Kaiserslautern (Guest AG Morigi). "Dissipation in ultracold quantum gases"

- Wednesday, 7th November, **Roland Albrecht**, AG Becher. "A single-atom electron spin qubit in silicon" Pla et al. Nature 489, 541 doi:10.1038/nature11449 (2012).
- Wednesday, 24th October, **Jens Baltrusch**, AG Morigi. "Modes of oscillation in radiofrequency Paul traps".
- Wednesday, 10th October, **Daniel Egger** (AG Wilhelm-Mauch). "Controlled catch and release of microwave photon states" (<http://arxiv.org/abs/1208.2950>). (2012)
- Wednesday, 13th September, **Mario Agio**, National Institute of Optics (INO-CNR) and European Laboratory for Nonlinear Spectroscopy (LENS), Italy, AG Becher's Guest. "Scattering and fluorescence in strongly confined optical fields"
- Thursday, 9th August, 2 p.m., E.04, **Hideo Kosaka**, Tohoku University, Japan, AG Becher's guest, "Quantum state transfer between photons and spins in a solid for quantum repeaters".
- Friday, 3rd August (11 a.m.) **Thomas Pattard**, APS Editorial Office, Ridge, NY AG Morigi's guest. "How to publish your work in the Physical Review".
- Wednesday, 1st August, **José Brito**, AG Eschner. "Coalescence of Single Photons Emitted by Disparate Single-Photon Sources" PRL 107,157402 .
- Wednesday 25th, July, **Brian Mischuk**, Aarhus University, guest AG Wilhelm-Mauch, "Qudit Quantum Computation in the Jaynes-Cummings Model".
- Thursday, 19th July, 2 p.m., E.04 , **Birgit Hausmann**, Harvard University, AG Becher's guest "Diamond Nanophotonic cavities for Integrated Quantum Networks".
- Wednesday, 11th July, **Tobias Kampschulte**, Guest AG Morigi, "EIT-control of single-atom motion in an optical cavity".
- Wednesday, 3rd July, **Yuval Sanders**, University of Waterloo, Guest AG Wilhelm-Mauch, "The science of qubit tune-up"
- Wednesday 27th June, **Stephan Ritter** (MPQ, Garching), Guest AG Morigi, "An elementary quantum network of single atoms in optical cavities".
- Wednesday, 20th June, **Simone Montanegro**, Univ. Ulm. AG Morigi's guest. "Control of correlated quantum dynamics"
- Friday, 15th June, **Geza Giedke** (LMU Munich) Guest AG Morigi. "Spin Physics in Open and Driven Quantum Dots".
- Wednesday, 30th May, **Oxana Mishina**, AG Morigi. "A Rydberg quantum simulator" Weimer et al. (2010). doi:10.1038/nphys1614
- Wednesday, 16th May, **Carsten Arend**, AG Becher. "Cavity QED with Magnetically Coupled Collective Spin States".

- Wednesday, 9th May, **Pierre-Luc Dallaire-Demers**, AG Wilhelm-Mauch "Signatures of Majorana Fermions in Hybrid Superconductor-Semiconductor Nanowire Devices"
- Wednesday , 25th April, **David Hunger**, AG Becher's guest. "Fiber Fabry-Perot cavities: A powerful tool for experiments with solid-state based quantum- and nanosystems"
- Tuesday, 21th April, **Igor Lesanovky**, Gues AG Morigi, "Many-body physics with Rydberg atoms"
- Wednesday 11th April, **Emily Pritchett**, AG Wilhelm-Mauch. 'Hybrid Quantum Circuit with a Superconducting Qubit Coupled to a Spin Ensemble'. Kubo et al (2011)
- Wednesday 21st March, **Johannes Otterbach**, Harvard University, AG Morigi's guest. Topic : Quantum Interfaces.
- Wednesday 7th March, **Phillipp Müller**, AG Eschner. 'Proposal for a quantum delayed- choice experiment'. R. Ionicioiu, D. Terno.
- Thursday, 1st March, Shmuel Fishmann, Technion (Haifa), Guest AG Morigi, "Transport in potentials random in space and time"
- Wednesday 15th February, **Mauricio Torres**, AG Morigi. Observation of Quantum Motion of a Nanomechanical Resonator ,
• Phys. Rev. Lett. 108, 033602 (2012)
- Wednesday 8th of February, **Bruno Taketani**, AG Morigi. "Entanglement Distillation by Dissipation and Continuous Quantum Repeaters". Phys. Rev. Lett. 107, 120502 (2011)
- Wednesday 1st of February, **Jan Huwer**, AG Eschner. "Quantum correction of photon-scattering errors", <http://arxiv.org/abs/1111.1622>.
- Wednesday 25th of January, **Susanne Blum**, AG Profs. Morigi/ Becher. "Theoretical and experimental analysis of nonlinear single photon frequency conversion". 2011

2011

- Wednesday 21st December 2011. **Janine Riedrich-Möller**. AG Becher "One- and two-dimensional photonic crystal micro-cavities in single crystal diamond", DOI 10.1038/nano.2011.190.
- Wednesday 14th December 2011. **Stefan Rist**, Scuola Normale Superiore of Pisa. 'Spectra of massless Dirac Fermions on the verge of exciton condensation'.

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- Monday, 7th November, 2011, **Tina Müller**, Cavendish Laboratory, Cambridge. "Control and coherence of photons from Chromium emitters in diamond and optically active quantum dots" (AG Becher's Guest).
 - Wednesday 26th October 2011. **Jörg Evers**, MPI for nuclear physics, Heidelberg (Prof. Morigi's guest).
 - Wednesday 5th October 2011. **Peter Groszkowski** (Prof. Wilhelm-Mauch), Measurements in circuit QED “.
 - Wednesday 14th September 2011. **Stefan Schütz**, AG Morigi “Self-organization of atoms in optical cavities”
 - Wednesday 27th, July 2011, **Hannes Gothe**, AG Eschner J.Klaers et al , "Bose-Einstein condensation of photons in an optical microcavity". Nature 468, 545-548(25 November 2010).
 - Friday, 8th July, 2011, **Pavel Bushev**, KIT Karlsruhe „Microwave – optical – solid state hybrid quantum repeater technology“
 - Wednesday, 22th June, 2011, **Christian Hepp**, AG Becher "Quantum entanglement between an optical photon and a solid-state spin qubit", E. Togan et al., Nat. 466, 730-735 (2010)
 - Wednesday, 15th June, 2011, **Nicolas Sangouard**, Geneva, "Quantum Networks with Atoms and Photons"
 - Tuesday, June 7, 2011. Prof. **Jonathan Home** (ETH Zürich), “Mixed-species ion chains for investigations of open quantum systems”.
 - Friday, 10. June, 2011 **Jürgen Volz**, ENS Paris, "Cavity-based single atom preparation and high-fidelity hyperfine state readout", Phys. Rev. Lett. 104, 203602 (2010).