Swiss Quantum Days 2024
Program Booklet

Villars-sur-Ollon
January 31 to February 2, 2024

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The Swiss Quantum Initiative is one of the measures to support research and innovation that the Federal Council adopted in May 2022, and aims to con-solidate Switzerland's excellent position in the field of quantum science and technologies.

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Dr. Rob Thew

Agenda

Time	Wednesday, **January 31, 2024**
12:00	Arrival & Posters Up
12:30	Lunch
13:30	Welcome
13:45	Invited Talk Alberto Morpurgo
14:30	Simon Wili
14:50	Javier Carrasco Avila
15:10	Coffee Break
15:40	Lorenzo Stasi
16:00	Guillaume Beaulieu
16:20	Aleksei Gaier
16:40	Julian Schmidt
17:00	Poster Session
19:00	Dinner
21:00	Swiss Quantum Initiative

Scan to read the Abstracts of the Invited and Contributed Talks

Time	Thursday, **February 1, 2**
09:00	Invited Talk Kirsten Moselund
09:45	Matteo Brunelli
10:05	Guanhao Huang
10:25	Coffee Break
10:55	Pavel Hrmo
11:15	Rodrogo Benevid
11:35	Manel Bosch
11:55	Michele Aldeghi
12:30	Lunch & Free Afte
16:00	Coffee Break
16:25	Invited Talk Renato Renner
17:10	Francesca Orsi
17:30	Lin-Qing Chen
17:50	Coffee Break
18:20	Fabian Schmid
18:40	Valerii Kozin
19:00	Keynote Talk Mikhail Lukin
20:00	Dinner

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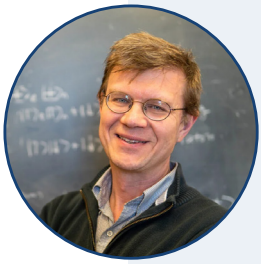
Time	Friday, **February 2, 2024**
09:00	Invited Talk Stefan Willitsch
09:45	Alexandra Mestre-Tora
10:05	Anatoly Kulikov
10:25	Coffee Break
10:55	Gianni Buser
11:15	Simon Neves
11:35	Ilaria Maccari
11:55	Nam Nguyen
12:15	Lunch
13:20	Invited Talk James Wootton
14:05	Artem Konokov
14:25	Coffee Break
14:50	Emre Yazici
15:10	Jessica Bavaresco
15:30	Prize Announcements
15:40	Closing Remarks

Our Keynote Speaker



Professor
Mikhail Lukin

Harvard Physics Department
Joshua and Beth Friedman University Professor

Co-Director of the Harvard Quantum Initiative in Science and Engineering

Co-Director of the Harvard-MIT Center for Ultracold Atoms

Quantum Optics Laboratory group

Exploring quantum error correction frontier with programmable atom arrays

A broad effort is currently underway to develop quantum computers that can outperform classical counterparts for certain computational or simulation tasks. Suppressing errors is one of the central challenges for useful quantum computing, requiring quantum error correction for large-scale processing. However, the overhead in the realization of error-corrected "logical" qubits, where information is encoded across many physical qubits for redundancy, poses significant challenges to large-scale logical quantum computing. In this talk, Prof Lukin will discuss the recent advances involving programmable, coherent manipulation of quantum systems based on neutral atom arrays excited into Rydberg states, allowing the control over several hundred qubits in two dimensions. In particular, this platform is used to explore quantum algorithms with encoded logical qubits and quantum error correction techniques. Using this logical processor with various types of error-correcting codes, Prof Lukin demonstrates that his group can improve logical two-qubit gates by increasing code size, outperform physical qubit fidelities, create logical GHZ states, and perform computationally complex scrambling circuits using 48 logical qubits and hundreds of logical gates. These results herald the advent of early error-corrected quantum computation, enabling new applications and inspiring a shift in addressing both the challenges and opportunities that lay ahead.

Our Invited Speakers

Professor
Alberto Morpurgo

from the University of Geneva speaking about Quantum Materials

Quantum Electronics group

Professor
Kirsten Moselund

from PSI and EPFL speaking about Quantum Technologies

PSI and EPFL

Professor
Renato Renner

from ETHZ speaking about Quantum Information and Communication

Quantum Information Theory group

Professor
Stefan Willitsch

from the University of Basel speaking about Quantum Sensing and Metrology

Cold and Controlled Molecules and Ions group

Doctor
James Wootton

from IBM Research Zurich speaking about Quantum Computation and Simulation

IBM Quantum, IBM Research Europe - Zurich

Abstracts of Invited & Contribute

Wednesday, January 31

Session chair: Géraldine Haack

13:45 – 14:30 Alberto Morpurgo **Invited Talk**

Adaptive Quantum Materials

In the context of electronic materials, the second quantum revolution is the result of impressive progress that is now allowing material control at the ultimate atomic scale. Perfect crystals of a multitude of compounds can be produced with thickness of only one or a few atoms, and manipulated nearly at will to form heterostructures with new electronic, optical, magnetic, and phononic properties. Their atomic thickness makes these artificial – or adaptive – quantum materials extremely sensitive to external stimuli, which is why they form an ideal platform for the realization of new types of devices with great potential for future technology. In this talk, I will try to illustrate with different examples (not only from my own research group) new ways in which adaptive quantum materials can be controlled and how this level of control can lead to new applications with a great potential for technological breakthroughs.

14:30 – 14:50 Simon Wili

Surprising Observation in a Quantum Simulation of Transport

We observe large nonlinear flows – not only of particles but also entropy – through a ballistic channel connecting two strongly interacting fermionic superfluids. We find that ≈1 kB entropy transported per particle is much larger than the local entropy of the equilibrium superfluid and is robust to changes of channel-geometry. Counterintuitively, superfluidity increases the speed of irreversible entropy transport.

ed Talks

14:50 – 15:10 Javier Carrasco Avila

Frequency tunable, cavity-enhanced single erbium quantum emitter in the telecom band

We demonstrate for the first time linear Stark tuning of the emission frequency of a single Er ion, embedded in a solid-state host and coupled evanescently to the mode of a silicon nano-photonic crystal cavity that results in a strong increase of its emission rate. These results are a key step towards rare earth ion-based quantum networks.

Session chair: Zoé Holmes

15:40 – 16:00 Lorenzo Stasi

Enabling photon-number resolution with SNSPDs

The ability to resolve photon-number-states is becoming an increasingly prominent topic in quantum information. This can be realized with novel superconducting nanowire single-photon detectors. Two architectures are presented: parallel-SNSPD and multi-pixel SNSPD. We show that such detectors can perform coherent and thermal state reconstruction, can enhance the performance of a heralded-single-photon-source, and can resolve photon-number-states in long-pulse of light.

16:00 – 16:20 Guillaume Beaulieu

Investigation of dissipative phase transitions in a two-photon driven Kerr resonator

Dissipative processes, often regarded as detrimental in quantum technology, can, in fact, offer significant advantages when carefully controlled and engineered. In this presentation, we will demonstrate how the interaction between the environment and a nonlinear superconducting resonator results in phase transitions. We will also show how these transitions can be experimentally characterized and harnessed for quantum sensing.

Abstracts of Invited & Contribute

16:20 – 16:40 Aleksei Gaier

Spintronic nanostructures for terahertz signals

Spintronic emitters are already a well-established platform for THz generation, exploiting the inverse spin Hall effect inside a bilayer formed by a ferromagnet and normal metal pumped by optical light. In this work, we investigate integrated spintronic emitters where the generated THz fields are emitted into the far field by the antenna surrounding the spintronic emitter.

16:40 – 17:00 Julian Schmidt

Integrated optics ion trap platform for quantum applications at PSI

Scalability remains a challenge for trapped ions due to the individual control required for each qubit. At the ETH-PSI Quantum Computing Hub, we develop surface electrode traps with integrated photonics to distribute laser beams to the ions arranged in a 2D geometry. The fabrication is performed at a MEMS foundry and could straightforwardly be scaled to thousands of trapping zones.

21:00 – 21:45 Swiss Quantum Initiative

The Swiss Quantum Commission (SQC) will provide an update on the first operational year of the Swiss Quantum Initiative (SQI) including current and planned funding instruments. The quantum community is invited to a dialogue on views and priorities for the upcoming years.

ed Talks

Thursday, February 1

Session chair: Gian Salis

09:00 – 09:45 Kirsten Moselund **Invited Talk**

Quantum Computing at PSI

In this talk we will discuss the range of quantum activities at PSI from basic materials research to photonic and superconducting qubits. The ETHZ-PSI quantum computing hub is located at PSI and aims to facilitate exchanges with industry. Nanofabrication infrastructure supports the development of superconducting technologies as well as integrated photonics for quantum applications.

09:45 – 10:05 Matteo Brunelli

A quantum-mechanical pendulum clock

Pendulum clocks are the quintessential time-keeping devices. I will present a model of an autonomous mechanical pendulum clock based on an optomechanical system. The pendulum clock is powered by light and its operation relies only on thermal resources. I will first identify a suitable classical regime and then illustrate how the clock performance is affected by quantum fluctuations.

10:05 – 10:25 Guanhao Huang

Room-temperature quantum optomechanics using engineered mechanical resonators

At room temperature, quantum optomechanical phenomena have only been observed in levitated nanoparticles and optically-trapped cantilevers. With our recent advances in engineered mechanical resonators, we have realized ultra-high quality factors (Q) by exploiting `soft clamping', achieving more than 100 quantum coherent oscillations at room temperature. In this talk, I will discuss various dominant physical processes that emerge in this parameter regime.

Abstracts of Invited & Contribute

Session chair: Cornelius Hempel

10:55 – 11:15 Pavel Hrmo

2-dimensional transport in a micro-fabricated Penning trap

Quantum computing with trapped ions is a leading approach towards large scale devices, but the use of radio-frequency trapping provides many limitations. We demonstrate quantum control using microfabricated Penning traps, which replace the radio-frequency with a magnetic field. We measure the lowest heating rates of any comparable ion trap, and demonstrate arbitrary 2-dimensional transport of ions for the first time.

11:15 – 11:35 Rodrigo Benevides

Probing quasiparticle dynamics in a superconducting qubit using an infrared source

A known source of decoherence in superconducting qubits is the presence of quasiparticles generated by, for example, high energy radiation. Here, we systematically study the properties of a transmon under illumination by infrared radiation with various powers, durations, and spatial locations. Despite the high energy of incident photons, our observations agree well with a model of low-energy quasiparticle dynamics.

11:35 – 11:55 Manel Bosch

Optical coherent feedback control of a mechanical oscillator

We experimentally demonstrate coherent feedback control of a mechanical oscillator, using a novel all-optical feedback scheme [PRX 13, 021023 (2023)]. Our work is the first to realize an all-optical feedback loop in optomechanics, avoiding noise and imprecision associated with measurements. Our scheme enables ground-state cooling and can be readily applied to different optomechanical systems and quantum control tasks.

ed Talks

11:55 – 12:15 Michele Aldeghi

Modular nanomagnets for spin qubits

Micromagnets enable qubit manipulation in spin qubit devices. The design of the magnets not only sets the speed at which qubits can be manipulated, but also influences the dephasing rate and the qubit frequency. Here we analyze a modular array of nanomagnets and investigate the accuracy of micromagnetic simulations on the prediction of qubit parameters.

Session chair: Martin Frimmer

16:25 – 17:10 Renato Renner **Invited Talk**

Why quantum information is relevant for gravity

Whether and how quantum theory can describe gravity is a long-standing and still open question. The main reason is that the regime where the quantum features of gravity would be visible is not yet experimentally accessible. Nonetheless, quantum information offers new tools that enable at least a theoretical study of this regime. To illustrate this, I will explain how such an information-theoretic approach can provide insights into the nature of the Hawking radiation emitted by black holes.

17:10 – 17:30 Francesca Orsi

Towards quantum simulation of random, all-to-all interacting Fermions

Holographic duality provides connection between certain quantum many-body physics models and general relativity. A hallmark example of such a model is the SYK model, describing fermions with all-to-all, random interactions. We will report on our progresses towards an experimental implementation of this model using cold atoms in a high-finesse cavity.

17:30 – 17:50 Lin-Qing Chen

Verifying quantum aspects of gravitational fields by quantum probes

I will present protocols involving gravitational sources in a quantum state, and discuss the effects through which different aspects of quantum features of gravity could be tested. The predictions are based on a quantum field theoretical formulation of linearized gravity in the field basis. Such a description could explicitly display quantum superposition of macroscopically distinct states of gravitational fields.

Session chair: Yiwen Chu

18:20 – 18:40 Fabian Schmid

Observations of Rabi oscillations in the Hydrogen molecular ion

The hydrogen molecular ion is the simplest molecule, and thus provides a setting for comparing theoretical chemistry and experiment at unparalleled precision. I will report on the first observations of single quantum state preparation and control, making use of quantum logic spectroscopy. We use this to observe the first Rabi oscillations in this ion, a key element towards spectroscopy.

18:40 – 19:00 Valerii Kozin

Ferroelectric quantum phase transition and cat states in cavity-coupled double quantum dot

We present a theoretical study of an array of double quantum dots coupled to a uniform cavity mode. We find that the electron subsystem develops a quantum phase transition and hosts the Schrodinger cat state as the ground state. The QPT is possible due to the inclusion of the Coulomb interaction, which is usually disregarded.

ed Talks

Friday, February 2

Session chair: Ilaria Maccari

09:00 – 09:45 Stefan Willitsch **Invited Talk**

Quantum metrology with single trapped molecules

Precision-spectroscopic investigations of molecular systems have recently gained considerable interest in the context of a variety of applications in fundamental physics. These include setting stringent constraints on the magnitude of the dipole moment of the electron, exploring potential time variations of fundamental constants and developing new types of highly precise clocks. In the talk, we will review recent progress on precision measurements on single trapped molecules focusing on the nitrogen molecular ion N2+ as an example. We will touch on the specific properties of molecules in the context of frequency metrology, discuss aspects of state initialisation and control, and highlight recently developed quantum protocols which enable vastly improved measurement sensitivities in experiments on molecules. We will also discuss a recently established prototype network for precision frequency transfer and comparison in Switzerland which is intended to form the nucleus of a wider national infrastructure for frequency metrology.

09:45 – 10:05 Alexandra Mestre-Tora

A tunable quantum interferometer for correlated moiré electrons

Magic angle twisted bilayer graphene (MATBG) enables tunable superconducting and insulating states. Exploiting the tunability, we present a gate-defined ring that can operate in the superconducting or normal-conducting regimes. Within the same device, we observe the Little-Parks and the Aharonov-Bohm effects, revealing a superconducting effective charge of 2e and a long coherence length of normal conducting electrons in MATBG.

Abstracts of Invited & Contribute

10:05 – 10:25 Anatoly Kulikov

Loophole-free Bell Inequality Violation with Superconducting Circuits

I will present a loophole-free violation of Bell's inequality with superconducting circuits[1]. We deterministically entangle a pair of qubits connected through a cryogenic link spanning 30 meters and perform fast high-fidelity measurements along randomly chosen bases. We find an average S-value of 2.0747±0.0033, violating Bell's inequality by more than 22 standard deviations.

[1] S. Storz et al, Nature 617, 265-270 (2023)

Session chair: Mayeul Chipaux

10:55 – 11:15 Gianni Buser

Quantum networking with microfabricated atomic vapor cells

Quantum memories are building blocks of quantum networks. Memories implemented in hot alkali vapor are attractive as they operate without cryogenics or ultra-high vacuum. We demonstrated single-photon storage and retrieval in such memories and for the first time implemented them in microfabricated cells compatible with wafer-scale mass production - a crucial step towards scalability. PRX Quantum 3, 020349 (2022) arXiv:2307.08538

11:15 – 11:35 Simon Neves

Quantum Fourier-Transform Infrared Spectrometer for Organic Gas Detection in Ambient Air

We report a quantum spectrometer allowing the detection of organic gasses. Photons from two different wavelength-ranges are entangled in a quantum interferometer, allowing to probe the gas with mid-infrared photons, and record the absorption spectrum via the more practical detection of near-infrared photons. Long interferometer arms enable the detection of low concentrations of methane, ethanol and methanol in ambient air.

ed Talks

11:35 – 11:55 Ilaria Maccari

Possible emergence of fermion quadrupling condensates in twisted bilayer graphene

Beyond electron pairing, multi-component superconductors may exhibit a different kind of order associated with the condensation of electron quadruplets. In this talk, I will present our Monte Carlo study on an effective model for magic-angle twisted-bilayer graphene and discuss the emergence of a fluctuations-induced phase, where a condensate formed by four electrons breaks time-reversal symmetry.

11:55 – 12:15 Nam Nguyen

Low-noise GaAs quantum dots

GaAs quantum dots have been developed with low noise. Photons emitted from completely separate quantum dots demonstrate excellent two-photon interference. The spin of the electron spin can be enhanced by optically cooling the nuclear spins, thereby increasing the electron coherence time by more than a factor of hundred. The prospects for creating low-noise photonic cluster states will be discussed.

Session chair: Patrick Potts

13:20 – 14:05 James Wootton **Invited Talk**

What makes a good experiment for proof-of-principle QEC?

The last few years have seen a dramatic increase in the number of proof-of-principle experiments for quantum error correction. The size and scope of these experiments are also increasing, including an example with 48 logical qubits, examples with over 100 physical qubits, and demonstrations of logical gates and magic state preparation. However, the large differences between these experiments makes it hard to compare progress. For this reason, we propose a flexible experiment that could be used for cross-platform comparisons, and look at preliminary results from first experiments with more than 100 qubits and 100 syndrome measurement rounds.

Abstracts

14:05 – 14:25 Artem Konokov

Strong coupling between a microwave photon and a singlet-triplet qubit

A microwave photon as an intermediate is a powerful way to implement "long" distant qubit-qubit gates. We have reached the strong coupling regime between a single photon and a singlet-triplet spin qubit for the first time. This is achieved through an architecture based on high-quality, magnetic-field resilient, high-impedance, superconducting resonators, and semiconducting nanowires with an intrinsic strong spin-orbit interaction.

Session chair: Mirjam Weilenmann

14:50 – 15:10 Emre Yazici

Electrically defined quantum emitters in 2D materials

Quantum emitters play a central role in quantum communication. Here, we describe electrically defined fully tunable quantum emitters in 2D materials. Unlike other solid-state sources, the quantum confined excitons we study can form the building blocks of an array of identical single-photon sources.

15:10 – 15:30 Jessica Bavaresco

Higher-order quantum operations and the emergence of indefinite causality

Operations that transform states are fundamental objects in quantum mechanics. Higher-order operations then are those that transform these operations. In this talk, we will discuss the formalism of higher-order operations, and how it can be exploited to efficiently optimize over strategies for quantum information tasks. We will also see how indefinite causal order emerges from this formalism.

List of Posters

Please find below the posters that are presented during the poster session taking place on January 31 from 17:00 to 19:00. The three best posters will be nominated by the SQD 2024 jury formed by Dr. Alexander Eichler, Prof. Esther Hänggi, and Prof. Vincenzo Savona, and honored with a poster prize.

No.	Authors	Title
P1	**Christoph Adam**, Hadrien Duprez, Natalie Lehmann, Antoni Yglesias, Solenn Cances, Kenji Watanabe, Takashi Taniguchi, Thomas Ihn, Klaus Ensslin	Entropy of a quantum dot in bilayer graphene
P2	**F. Adinolfi**, P. Pandey, A. Bruno, L. Michaud, V. H. Kamrul, A. Grimm	Towards the experimental implementation of a critical Kerr-cat qubit
P3	**Lorenzo Amato**, Markus Müller	Ultrafast light-induced long range antiferromagnetic correlations in paramagnets
P4	Taner Esat, Dmitriy Borodin, Jeongmin Oh, Andreas J. Heinrich*, F. Stefan Tautz, **Yujeong Bae***, Ruslan Temirov	Quantum sensing of atomic scale electric and magnetic fields
P5	Rodrigo Benevides, Tom Schatteburg, Maxwell Drimmer, Hugo Doeleman, Yiwen Chu	Microwave-to-optical quantum transducer with a Brillouin resonator
P6	**Francesco Blanda**, **Nikunj Sangwan**, Eric Jutzi, Fabrizio Volante, Christian Olsen, Klaus Enslin, Thomas Ihn, Andrea Hofmann	Towards Bilayer Graphene and Planar Ge Qubits
P7	**Gianmichele Blasi**, Shishir Khandelwal, and Géraldine Haack	Exact finite-time correlation functions for multi-terminal setups: Connecting theoretical frameworks for quantum transport and thermodynamics
P8	**Sadra Boreiri**, Bora Ulu, Nicolas Brunner, Pavel Sekatski	Noise-robust proofs of quantum network nonlocality

List of Posters

P9	**Isis Bou Jaoude**, Anna Fischer, Preksha Tiwari, Noelia Vico Trivino, Heinz Schmid, Kirsten Moselund	III-V Semiconductor Spherical Microresonator
P10	**Alistair Brash**, Richard Warburton	Quantum Dot Photon Sources
P11	**Tiff Brydges**, Arslan Raja, Nikolai Kuznetsov, Mingsong Wu, S. Bhave, H. Zbinden, T. Kippenberg, R. Thew	Integrated Photonics for Quantum Repeaters
P12	**Tabea Bühler**, Timo Zwettler, Giulia Del Pace, Victor Helson, Aurélien Fabre, Gaia Bolognini, Jean-Philippe Brantut	Light-induced phase transitions and their dynamics in strongly interacting ultracold Fermions
P13	**Su Yeon Chang**, Sofia Vallecosa, Bertrand Le Saux, Michele Grossi	Latent Style-based Quantum GAN for high-quality Image Generation
P14	**Jingjing Chen**, Adrian Holzäpfel, Mikael Afzelius	Efficient and reversible optic-to-spin conversion for quantum memories
P15	H. Shirzad, F. Morier-Genoud, A. Götze, E. Losero, C. Galland, P. Knittel, **M. Chipaux**	Electron-beam based nanoscale quantum controls
P17	**Aaron Daniel**, Matteo Brunelli, Aashish A. Clerk, Patrick P. Potts	Keldysh Input-Output Theory
P18	**Maria de Matos Afonso Pereira**, Rebecka Sax, Alberto Boaron, Raphaël Houlmann, Rob Thew, Hugo Zbinden	Quantum Keys Ready for Deployment: A Practical QKD Prototype Based on Photonic Integrated Circuits
P19	**Franco De Palma**, Fabian Oppliger, Wonjin Jang, Stefano Bosco, Marian Janik, Stefano Calcaterra, Georgios Katsaros, Giovanni Isella, Daniel Loss, Pasquale Scarlino	Strong hole-photon coupling in planar Ge
P20	**Artem Denisov**, Hadrien Duprez, Veronika Reckova, Solenn Cances, Kenji Watanabe, Takashi Taniguchi, Thomas Ihn, Klaus Ensslin	Ultra-long relaxation of a Kramers qubit formed in single-hole bilayer graphene quantum dot

P21	**Tobias Donner**, Fabian Finger, Rodrigo Rosa-Medina, Nicola Reiter, Panagiotis Christodoulou, Tilman Esslinger	Spin- and momentum-correlated atom pairs mediated by photon exchange and seeded by vacuum fluctuations
P22	**Sophie Egelhaaf**, Jef Pauwels, Marco Túlio Quintino, Roope Uola	Certifying measurement incompatibility in Prepare-and-Measure and Bell scenarios
P23	D. A. Visani, L. Catalini, C. L. Degen, **A. Eichler**, and J. del Pino	Near-resonant nuclear spin detection with high-frequency mechanical resonators
P24	**Mihael Erakovic**, Markus Reiher	Quantum computing for quantum chemistry
P25	**J. Flannery**, L. I. Huber, R. Matt, R. Oswald, M. Stadler, D. P. L. Aude Craik, J. Home	Search for a Fifth Force Using High Precision Isotope Shift Frequency Measurements of Calcium in a Trapped Ion Experiment
P26	**Anthony Gandon**, Alberto Baiardi, Pauline Ollitrault, Ivano Tavernelli	Excited-state properties of electronic structure hamiltonian from quantum Subspace Expansion
P27	N. D'Anna, D. Ferreira Sanchez, G. Matmon, J. Bragg, P.C. Constantinou, T.J.Z. Stock, S. Fearn, S.R. Schofield, N.J. Curson, M. Bartkowiak, Y. Soh, D. Grolimund, **S. Gerber** & G. Aeppli	Non-destructive X-ray imaging of patterned delta-layer devices in silicon
P28	**Simon Geyer**, Rafael S. Eggli, Toni Berger, Dominik M. Zumbühl, Richard J. Warburton, Andreas V. Kuhlmann	Hole spin qubits in silicon FinFETs
P29	**Valentin Goblot**, Kexin Wu, Enrico Di Lucente, Elena Losero, Yuchun Zhu, Hossein Babashah, Nicola Marzari, Michele Simoncelli, Christophe Galland	Probing heat transport in diamond cantilevers with NV centers as quantum thermometers
P30	**Lorenzo Graziotto**, Josefine Enkner, Felice Appugliese, Dalin Boriçi, Christian Reichl, Werner Wegscheider, Giacomo Scalari, Cristiano Ciuti, Jerome Faist	Cavity vacuum fields renormalization of the g factor probed with a hovering resonator

List of Posters

P31	**Sebastián Guerrero Soriano**, Stefan Ernst, Christian Degen	Cryogenic Quantum Sensing of Multiferroics
P32	**C.-M. Halati**, A. Sheikhan, L. Tolle, A. Bezvershenko, A. Rosch, H. Ritsch, T. Giamarchi, C. Kollath	Fluctuations and symmetry effects in many-body self-organization in a dissipative cavity
P33	**Pavel Hrmo**, Benjamin Wilhelm, Lukas Gerster, Martin van Mourik, Marcus Huber, Rainer Blatt, Philipp Schindler, Thomas Monz, Martin Ringbauer	Native qudit entanglement in a trapped ion quantum processor
P34	**Guanhao Huang**, Alberto Beccari, Alessio Zicoschi, Xia Yi, Nils J. Engelsen, and Tobias J. Kippenberg	Room-temperature quantum optomechanics using an ultra-low noise cavity
P35	**S. Iadanza**, P. Khorasani, G. Raino, S. Kim, M. Kovalenko, K. E. Moselund	Photonic Crystal (PhC) Cavity Enhanced Light-Matter Interactions of Perovskite Quantum Dots (PQDs)
P36	**Elsa Jöchl**, Lucy Hale, Felix Helmrich, María Barra-Burillo, Luis E. Hueso, Rainer Hillenbrand, Mattias Beck, Jérôme Faist and Giacomo Scalari	Ultrastrong light-matter interaction at the single element level
P37	**Richard Karl**, Aleksandr Shlykov, Mikolaj Roguski, Stefan Willitsch	Precision Spectroscopy and Coherent Manipulation of a Single Molecular Nitrogen Ion
P38	**Seonyeong Kim**, Gediminas Seniutinas, Jonas Meirer, Tobias Sjölander, Moritz Kirschmann, Kirsten Moselund	Quantum Sensors for Brain Imaging: Enhancements of light extraction from a diamond layer by photonic crystals
P39	**Valerii Kozin**, D. Miserev, D. Loss, J. Klinovaja	Quantum phase transitions and cat states in cavity-coupled quantum dots
P40	**Lorenzo Laneve**	Quantum signal processing over SU(N): exponential speed-up for polynomial transformations under Shor-like assumptions
P41	**Jiawen Liu**, Francesco Bertot, Ileana-Cristina Benea-Chelmus	Superconducting integrated photonics for THz quantum sensing

P42	**Stefano Marti**, Uwe von Lüpke, Om Joshi, Yu Yang, Marius Bild, Andraz Omahen, Yiwen Chu, Matteo Fadel	Quantum squeezing in a nonlinear mechanical oscillator
P43	**A. McConnell**, G. Matmon, K. Schnorr, C. Bostedt, G. Aeppli, S. Gerber	Towards direct imaging of Rydberg states in Si ∂-layers using an X-ray free-electron laser
P44	**Iyán Méndez Veiga**, Esther Hänggi	Realistic Randomness for Quantum Cryptography Applications
P45	**Friederike Metz**, Giuseppe Carleo	Continuous-Space Quantum Simulation: A Discretization-Free Approach with Hybrid Quantum-Classical Ansatze
P46	**Fabrizio Minganti**, Filippo Ferrari, Luca Gravina, Debbie Eeltink, Pasquale Scarlino, Vincenzo Savona	Steady-state quantum chaos in open quantum systems
P47	**Johannes Motruk**, Dario Rossi, Dmitry A. Abanin, Louk Rademaker	Kagome chiral spin liquid in transition metal dichalcogenide moiré bilayers
P48	**Roberto Mottola**, Gianni Buser, Suyash Gaikwad, Philipp Treutlein	Optical Memory in a Microfabricated Rubidium Vapor Cell
P49	**Markus Niese**, Michele Masseroni, Tingyu Qu, Jonas Gerber, Thomas Ihn, and Klaus Ensslin	Toward single-carrier operations in transition metal dichalcogenide quantum dots
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