The 18th Capri Spring School on Transport in Nanostructures 2024

	Sunday 14.04.2024	Monday 15.04.2024	Tuesday 16.04.2024	Wednesday 17.04.2024	Thursday 18.04.2024	Friday 19.04.2024	Saturday 20.04.2024
Chair		Schönenberger	De Martino	Tagliacozzo	Schönenberger	Egger	
9:00-9:55		M. Devoret (1)	M. Devoret (2)	P. Roushan (3)	S. Diehl (1)	D. Bruß	
10:00-10:55		S. Vijay (1)	F. Kunst (2) via Zoom	F. Kunst (3) via Zoom	M. Devoret (3)	S. Vijay (3)	
11:00-12:00		Coffee Break (30 min) & **Poster Session** (30 min)					
12:00-12:55		F. Kunst (1) via Zoom	P. Lucignano	S. Vijay (2)	A. Wallraff (1)	S. Diehl (3)	School excursion to Pompeii/ Sorrento (if weather permits) Start at 8 am, Anacapri Return by 6 pm
13:00-16:00		Lunch Break					
Chair		Egger	Bercioux		Bercioux	De Martino	
16:00-16:55		P. Roushan (1)	P. Roushan (2)		S. Diehl (2)	A. Wallraff (3)	
17:00-17:30		Coffee Break		Free Afternoon	Coffee Break		
17:30-18:25	Registration Hotel BiancaMaria	**Participant talk**	**Participant talk**		A. Wallraff (2)	**Participant talk**	
18:30-19:30	19:00-19:40	**Poster presentation**			**Participant talk**	Concluding remarks	
20:00 Dinner	Le Arcate	Le Arcate	Le Arcate	Free dinner	Le Arcate	Le Arcate	

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Dagmar Bruß	Generalised quantum measurements
Michel Devoret	Experimental implementation of non-unitary operations in quantum superconducting circuits
Sebastian Diehl	Driven open quantum matter: From micro- to macrophysics
Flore Kunst	Non-Hermitian physics
Procolo Lucignano	Improving quantum annealing: shortcuts to adiabaticity and dissipation
Pedram Roushan	Quantum simulation with superconducting qubits
Sagar Vijay	Measurement-Induced Quantum Many-Body Phenomena
Andreas Wallraff	tba

Poster presentation (2 min)

Monday Session (18:30 - 19:30)	Niklas Bruckmoser	Gerald Fux
	Anton Halaski	Nico Ackermann
	Maximilian Nitsch	Florian Wallner
	Tim Pokart	Samuel Rudge
	Giulia Salatino	Erik Samuelsen
	Harald Schmid	Adrian Köhler
	Christian Ventura Meinersen	Jonas Vinther
	Alvaro Donis Vela	Johann Zöllner
	Arnau Lira Solanilla	Isak Brundin
	Aisel Shiralieva	

Participant Talks

Monday Session (12+3)	Carolina Martinez Strasser	Topological properties of a non-Hermitian quasi-1D chain with a flat band
	Elizabeth Louis Pereira	Non-Hermitian topological modes from local loss engineering in photonic arrays
	Kilian Seibold	Quantum dynamics of Dissipative Kerr soliton
	Gianluca Passarelli	Time crystals with long-range dissipation
Tuesday Session (12+3)	Nico Albert	Truncated Hilbert space approach for simulating dynamics in perturbed Ising chains
	Lucas Matri	Quantum Algorithmic Cooling
	Karim Chahine	Entanglement phases, localization and multifractality of monitored free fermions in 2D
	Guangze Chen	Simulating open quantum systems with giant atoms
	Luis Colmenarez	Accurate optimal quantum error correction thresholds from coherent information
	Finn Eckstein	Robust teleportation of a surface code and cascade of topological quantum phase transitions
	Verena Feulner	SNAIL-type multi-qubit coupler

Participant Talks

Thursday Session (12+3)	Zejian Li	Entanglement dynamics in monitored long-range interacting systems: Non-equilibrium spin-wave theory for quantum trajectories
	Spenser Talkington	Keldysh Input-Output Theory for Cavity Quantum Materials
	Julia Kunzelmann	Keldysh Input-Output Theory for Cavity Quantum Materials
Friday Session (12+3)	Samuel Morales	Engineering unsteerable states with active feedback
	Yugo Onishi	Fundamental bound on topological gap
	Rémi Rousseau	Dissipative stabilization of a squeezed cat qubit
	Florian Unseld	A 2x2 Quantum Processor in 28Si/SiGe
	Kateryna Zatsarynna	Dynamics of Andreev bound states
	Martijn Zwanenburg	Optimal control of fluxonium qubits
	Dario Bercioux	Information regarding the excursion to Pompeii & Sorrento

Short talks abstracts: Monday Session

From 17:30 to 18:30

Carolina Martinez Strasser (Donostia International Physics Center) — *Topological properties of a non-Hermitian quasi-1D chain with a flat band*

We explore the spectral characteristics of a non-Hermitian quasi-1D lattice in two different dimerization configurations. The lattice exhibits a zero-energy flat band, and an accumulation of bulk eigenstates at the boundaries. Despite this behavior, we identify non-trivial edge states at zero energy for the first configuration through a real-space topological invariant called the biorthogonal polarization. For the second configuration, we analyze the finite quantum metric associated with the flat band. Interestingly, this configuration exhibits the skin effect, even though the system has a spectrum that is purely real or imaginary. Both non-Hermitian diamond chains can be mapped to models of Su-Schrieffer-Heeger chains, either non-Hermitian or Hermitian, both featuring a flat band. This mapping provides valuable insights into the system's properties.

Elizabeth Louis Pereira (Aalto University) — *Non-Hermitian topological modes from local loss engineering in photonic arrays*

Non-Hermitian systems have risen as a powerful strategy to engineer new forms of topological excitations. Photonic devices allow the creation of a whole variety of new artificial lattices challenging to emulate in conventional materials, opening up possibilities to realize new forms of topological matter. Beyond conventional photonic topological states in closed quantum systems, photonic devices provide a flexible platform to harvest non-Hermitian topology, and in particular, robust topological modes by exploiting engineered gains and losses. Here [1] we present a family of photonic models relying on the real-space modulation of photonic losses giving rise to non-Hermitian topological excitations. We demonstrate that the non-Hermitian topological modes survive spatial fluctuations in the loss and couplings of the system, and we also discuss the localization transition associated with this model in the quasicrystalline in analogy to the Hermitian model. Our results provide a realistic strategy to create topological modes in photonic systems from real-space loss engineering.

[1] E. L. Pereira, H. Li, A. Blanco-Redondo, and J. L. Lado, "Non-hermitian topology and criticality in photonic arrays with engineered losses", arXiv preprint arXiv:2311.09959 (2023)

Kilian Seibold (University of Konstanz) — *Quantum dynamics of dissipative Kerr solitons*

Dissipative Kerr solitons arising from parametric gain in ring microresonators are usually described and understood within a classical mean-field framework. In this work, I develop a quantum-mechanical model of dissipative Kerr solitons in terms of the Lindblad master equation formalism and study the model via the truncated Wigner method. In my talk, using the theory of open quantum systems, I will show that the solitons experience a finite coherence time due to quantum fluctuations originating from losses. The Liouvillian spectrum of the system is characterized by a set of eigenvalues with finite imaginary part and vanishing real part in the limit of vanishing quantum fluctuations. This arrangement emerges asymptotically in the limit of large input power, and the Liouvillian gap vanishes as a power law of the total photon occupation in the microring modes. This shows that DKSs are a specific manifestation of a dissipative time crystal. Establishing the link between DKSs and dissipative time crystals is an important step in the study and characterization of spontaneous time-translational symmetry breaking in quantum systems out of equilibrium. While being a theoretical work per se, special consideration will be given to the experimental implementations of the system under investigation.

Gianluca Passarelli (University of Napoli "Federico II") — *Time crystals with long-range dissipation*

In this talk, I will discuss dissipative time crystals in spin systems, typically observed when the total magnetization is conserved. Relaxing this condition, we find that persistent time-crystal oscillations can still exist, provided the symmetry is restored in the thermodynamic limit. Using an ad-hoc Lindbladian with power-law decaying spin operators, our study uncovers a rich phase diagram in the model's fixed points, including a time-crystal phase and various phase transitions. The mean-field approximation proves quantitatively accurate in the long-range regime, showing the system lacks significant quantum fluctuations. This research broadens the understanding of dissipative time crystals beyond traditional spin symmetry constraints.

Short talks abstracts: Tuesday Session

From 17:30 to 19:15

Nico Albert (TU Dresden) — *Truncated Hilbert space approach for simulating dynamics in perturbed Ising chains*
Simulating dynamics in interacting quantum many-body systems is a challenging problem. We develop a truncated Hilbert space approach and apply it to the quantum Ising chain with both transverse and longitudinal fields, calculating its spectral function as well as dynamics following quenches. We find that the characteristic features of this model, such as E_8 particles with universal mass ratios, are well captured in the truncated Hilbert space approach. We also use this new method to study the confinement dynamics of domain-wall bound states in the ferromagnetic phase.

Lucas Marti (Friedrich-Alexander-University Erlangen-Nürnberg) — *Quantum Algorithmic Cooling*
We present a cooling algorithm for ground state preparation of fermionic Hamiltonians. Our algorithm makes use of the Hamiltonian simulation of the considered system coupled to an ancillary fridge, which is regularly reset to its known ground state. We derive suitable interaction Hamiltonians that originate from ladder operators of the free theory and initiate resonant gaps between system and fridge. We further propose a spectroscopic scan to find the relevant eigenenergies of the system using energy measurements on the fridge. These insights allow a ground state cooling algorithm for fermionic systems that is efficient, i.e. its runtime is polynomial in the system size, as long as the initial state is prepared in a low-energy sector of polynomial size. We achieve the latter via a fast, quasi-adiabatic sweep from a parameter regime whose ground state can be easily prepared. We generalize the algorithm to prepare thermal states and demonstrate our findings on the Fermi-Hubbard model.

Karim Chaine (University of Cologne) — *Entanglement phases, localization and multifractality of monitored free fermions in 2D*
We investigate the entanglement structure and wave function characteristics of continuously monitored free fermions with U(1)-symmetry in 2D. Using exact numerical simulations, we establish the phenomenology of the entanglement transition and explore the similarities and differences with Anderson-type localization transitions. At weak monitoring, we observe characteristic $L\log(l)$ entanglement growth and multifractal dimension $D_q = 2$, resembling a metallic Fermi liquid. At strong monitoring, we find a phase transition into an area law, localized phase and a Poissonian distribution for the entanglement spectrum is seen. In between, we reveal another point in the low-measurement regime with indications of an emergent conformal invariance and strong multifractality. Furthermore, we find another witness of multifractality in the spectral form factor. Our results shape the understanding of a monitoring-induced metal-to-insulator transition in entanglement content. This establishes 2D monitored fermions as a unique platform to explore the connection between non-unitary quantum dynamics in D dimensions and quantum statistical mechanics in $D+1$ dimensions.

Guangze Chen (Chalmers University of Technology) — *Simulating open quantum systems with giant atoms*
Open quantum many-body systems are of both fundamental and applicational interest. In many cases, numerically solving such systems with classical methods is infeasible; instead, quantum simulation is required. Yet, conventional quantum simulation methods either require a large amount of ancilla qubits or operate within limited parameter spaces. To overcome these challenges, we put forward a novel protocol for simulating open quantum many-body systems with giant atoms. Unlike conventional point-like small atoms, giant atoms couple to the environment at multiple points, yielding interference effects that grant remarkable tunability in the interactions between the atoms and the environment. Utilizing this high tunability, we demonstrate efficient simulation of a qubit coupled to a dissipative qubit with two giant atoms coupled to a waveguide. Our results can be extended to a larger number of giant atoms, and pave the way towards versatile simulation of open quantum many-body systems.

Short talks abstracts: Tuesday Session

From 17:30 to 19:15

Luis Colmenarez (RWTH Aachen University) — *Accurate optimal quantum error correction thresholds from coherent information*

Quantum error correcting (QEC) codes protect quantum information from decoherence, as long as error rates fall below critical error thresholds. In general, obtaining thresholds implies simulating the QEC procedure using, in general, sub-optimal decoding strategies. In a few cases and for sufficiently simple noise models, optimal decoding of QEC codes can be framed as a phase transition in disordered classical spin models. In both situations, accurate estimation of thresholds demands intensive computational resources. Here we use the coherent information of the mixed state of noisy QEC codes to accurately estimate the associated optimal QEC thresholds already from small-distance codes at moderate computational cost. We show the effectiveness and versatility of our method by applying it first to the topological surface and color code under bit-flip and depolarizing noise. We then extend the coherent information based methodology to phenomenological and quantum circuit level noise settings. For all examples considered we obtain highly accurate estimates of optimal error thresholds from small, low-distance instances of the codes, in close accordance with threshold values reported in the literature. Our findings establish the coherent information as a reliable competitive practical tool for the calculation of optimal thresholds of state-of-the-art QEC codes under realistic noise models.

Finn Eckstein (University of Cologne) — *Robust teleportation of a surface code and cascade of topological quantum phase transitions*

Teleportation is a facet where quantum measurements can act as a powerful resource in quantum physics, as local measurements allow to steer quantum information in a non-local way. While this has long been established for a single Bell pair, the teleportation of a fault-tolerant logical qubit presents a fundamentally different challenge as it requires the teleportation of a many-qubit state. Here we investigate a tangible protocol for teleporting a long-range entangled surface code state using elementary Bell measurements and its stability in the presence of tunable coherent errors. We relate the underlying threshold problem to the physics of anyon condensation under weak measurements and map it to a variant of the Ashkin-Teller model of statistical mechanics with Nishimori type disorder, which gives rise to a cascade of phase transitions. Tuning the angle of the local Bell measurements, we find a continuously varying threshold. Notably, the threshold moves to infinity for the X + Z angle along the self-dual line – indicating an optimal protocol that is fault-tolerant even in the presence of coherent noise. Our teleportation protocol, which can be readily implemented in dynamically configurable Rydberg atom arrays, thereby gives guidance for a practical demonstration of the power of quantum measurements.

Verena Feulner (Friedrich-Alexander-University Erlangen-Nürnberg) — *SNAIL-type multi-qubit coupler*

An important part of research in the field of quantum computing is the implementation of multi-qubit gates whose execution time is significantly faster than the decoherence time of the qubits used. At the same time, a precision should also be achieved that is high enough to be able to use the gates for meaningful purposes. It is very difficult to represent interactions between more than two qubits, these have so far been split into two-body interactions, which also costs the process time and is therefore much more susceptible to the decoherence of the qubits. So far, it is also very difficult to simulate qubits interacting diagonally with quantum computer architectures on a rectangular grid. This is associated with high gate consumption and thus inaccuracy, since one needs several gates for a diagonal interaction. This project is related to the idea of finding a way to achieve diagonal coupling of qubits and possibly use the circuit for multi-qubit gates. We are investigating whether a particular quantum circuit with four transmon qubits and a SNAIL coupler can achieve this goal.

Short talks abstracts: Thursday Session

From 18:30 to 19:15

Zejian Li (ICTP — Trieste) — *Entanglement dynamics in monitored long-range interacting systems: Non-equilibrium spin-wave theory for quantum trajectories*

We present a stochastic spin-wave theory for studying non-equilibrium quantum trajectories of spin systems with long-range interactions described by a Lindblad master equation. The proposed method assumes the system to admit a strong collective spin polarization, on top of which spin-wave excitations are bosonized via a truncated Holstein-Primakoff expansion in a self-consistent rotating frame. The resolution of quantum trajectories provided by our method allows direct access to entanglement in the unravelled dynamics for thermodynamically large numbers of interacting spins. We demonstrate the method by studying an entanglement phase transition in a driven-dissipative spin system with power-law interaction.

Spenser Talkington (University of Pennsylvania) — Keldysh Input-Output Theory for Cavity Quantum Materials

In recent years strong light-matter coupling has emerged as a promising mechanism to tune many-body correlations in electronic and spin systems. Within this realm, quantum materials embedded in cavities interacting with photon quanta have been a theorist's playground for realizing exotic states. Notable examples include realizing dressed light-matter states, tuning superconducting order parameters, and stabilizing exotic magnetic orders. In conjunction with this, recent advances in quantum materials science and cavity technologies bring the realization of these states closer to reality. Despite the possibility and desire to realize exotic states, a key question remains in how to probe these states and show that they have the claimed ordering. Here, in conjunction with Ben Kass, Martin Claassen and myself, we propose a direct relation between the input state, the correlation functions of the material in the cavity, and the correlation functions of the light output by a leaky cavity. We both generalize quantum optical input-output relations by considering extended quantum systems that go beyond single quantum emitters, and introduce Keldysh input-output theory as a new, systematic way to calculate input-output correlation functions theory using Keldysh field theory. Our work builds a bridge between theoretically proposed cavity quantum materials and the experimental relevance of probing output fields from a leaky cavity.

Julia Kunzelmann (Heinrich-Heine-University Düsseldorf) — *Limits on the router rate in routers with memories*

Quantum routers play an important role in quantum communication networks, enabling the transmission of quantum information over longer distances. To increase the repeater rate in multipartite networks, multiplexing between quantum memories can be used. In our work, we investigate the limitations of router rates in quantum networks with N parties, each equipped with m memories. Based on our generalized multiplexing scheme for N parties we analyze the relation between the maximally achievable router rate and the number of parties and memories included in the network. We present both, numerical and analytical results.

Short talks abstracts: Friday Session

From 17:30 to 19:15

Samuel Morales (Heinrich-Heine-University Düsseldorf) — Engineering unsteerable states with active feedback

We propose active steering protocols for quantum state preparation in quantum circuits where each system qubit is connected to a single detector qubit, employing a simple coupling elected from a small set of steering operators. The decision is made such that the expected cost-function gain in one time step is maximized. We apply these protocols to several many-qubit models. Our results are underlined by three remarkable insights. First, we show that the standard fidelity does not give a useful cost function; instead, successful steering is achieved by including local fidelity terms. Second, although the steering dynamics acts on each system qubit separately, entanglement in the generated target state is introduced, and can be tuned at will, by performing Bell measurements on detector qubit pairs after every time step. This implements a weak-measurement variant of entanglement swapping. Third, numerical simulations suggest that the active steering protocol can reach arbitrarily designated target states, including passively unsteerable states such as the N-qubit W state.

Yugo Onishi (Massachusetts Institute of Technology) — Fundamental bound on topological gap

Insulating states with a finite energy gap are ubiquitous. The finite energy gap between the ground state and the first excited state results in vanishing DC conductivity at zero temperature, hence insulating states. Much research effort has been put into exploring interesting ground state properties, including topological responses such as the integer/fractional quantum Hall effect. On the other hand, the size of the energy gap seems not to have been paid much attention so far, even though realizing a large energy gap is crucial to experimentally observe these interesting ground state properties. In this talk, I will present a result on fundamental gap bounds in topological insulators [1]. We derive a universal gap bound determined only by free electron mass, electron density, and Chern number. The bound applies to strongly correlated states, including fractional quantum Hall states. Our result reveals a relation between the ground state properties and the energy gap, suggesting a new research direction.

[1] Yugo Onishi, Liang Fu, Fundamental bound on topological gap. arXiv:2306.00078 (accepted to PRX)

Rémi Rousseau (Kastler–Brossel Laboratory) — *Dissipative stabilization of a squeezed cat qubit*

Bosonic codes offer an hardware-efficient approach to quantum error correction by exploiting the infinite-dimensional Hilbert space of the quantum harmonic oscillator to implement a first layer of error correction. In particular, dissipative cat qubits autonomously stabilize two coherent states of opposite phases of the oscillator by engineering an interaction exchanging photons in pairs with the oscillator's environment. Since the overlap of the wavefunctions of the coherent states decreases exponentially with mean photon number, bit-flip errors of the cat qubit are also suppressed exponentially, at the cost of a linear increase of phase-flip errors. It was predicted recently (Xu et al., npj Quantum Information 9, 78 (2023)) that squeezing the cat qubit should allow to enhance the exponential scaling factor of the bit-flip time, owing to the smaller overlap in between squeezed coherent states. Importantly, this improvement is expected to incur no additional cost regarding the phase-flip time. In this work, we experimentally demonstrate dissipative stabilization of a squeezed cat qubit by engineering an additional interaction term in between the oscillator and its environment, on top of the two-photon exchange.

Short talks abstracts: Friday Session

From 17:30 to 19:15

Florian Unseld (QuTech - TU Delft) — _A 2x2 Quantum Processor in 28Si/SiGe_

Some of the largest semiconductor-based quantum processors are constrained to a linear arrangement of qubits. Executing an algorithm in such one-dimensional arrays demands an excessive overhead and requires higher fidelities to meet error correction thresholds. Thus, it is crucial to expand these linear arrays in the second dimension and increase the connectivity of each qubit. While in other platforms such as GaAs or Ge/SiGe 2D arrays were successfully implemented, such a demonstration has not yet been realized in Si/SiGe. I will present control over a 4-qubit device in a square 2x2 configuration. The device is based on a 28Si/SiGe heterostructure, with each quantum dot tuned to the single electron regime. Dedicated barrier gates between neighboring quantum dots allow us to implement two-qubit gates between qubits while staying at the noise-resilient symmetry point. Furthermore we operate the device at low magnetic field with Lamour frequencies below 150 MHz. By shuttling electrons.

Katerina Zatsarynna (Heinrich-Heine-University Düsseldorf) — _Dynamics of Andreev bound states_

Josephson junctions harbor under-gap states – Andreev bound states (ABSs). Even/odd occupation of these states gives rise to even/odd Andreev sector parity. A qubit can be encoded by ABSs if the parity is conserved. However, qubit operation is limited due to the interactions between ABSs and above-gap continuum states causing parity switches. In a recent experiment Andreev sector parity is dynamically polarized using microwave pulses. In our current work we extend the previous theory explaining experimental results, for finite-length weak links with spin-orbit interactions and magnetic field.

Martijn Zwanenburg (TU Delft) — _Optimal control of fluxonium qubits_

In recent years, fluxonium superconducting qubits have emerged as the potential successor of the transmon qubit. The relatively low qubit frequency and double-well potential of the fluxonium give rise to an order of magnitude improvement of coherence times compared to the transmon, which has led to record-breaking gate performance in superconducting qubits. Qubit operations on transmon qubits are commonly implemented using DRAG pulses. These pulses are specifically designed for weakly anharmonic oscillators for which the rotating-wave approximation (RWA) holds, and allow for the cancellation of leakage errors and the AC Stark shift. Fluxonium qubits are strongly anharmonic qubits for which the RWA generally does not hold, motivating the question whether DRAG pulses can still provide maximum gate fidelities for these qubits. In this work, we investigate in which regime DRAG pulses can still give coherence-limited gate fidelities on fluxonium qubits and we introduce a calibration scheme that allows for accurate and deterministic calibration of DRAG pulses for fluxonium qubits.

Dario Bercioux (Donostia International Physics Center) — Information regarding the excursion to Pompei & Sorrento

Important information for the excursion on Saturday to Pompeii and Sorrento. Pay attention!

Poster sessions

Quick introduction on Monday & daily in the morning after the coffee breaks

1. Niklas Bruckmoser (Walther Meissner Institute) — *Optimization of Fabrication Methods for High Coherence Superconducting Circuits*
2. Gerald Fux (ICTP - Trieste) — *Entanglement - Magic Separation in Hybrid Quantum Circuits*
3. Anton Halanski (Free University Berlin) — *Quantum Feedback Control for Quantum Error Correction on Superconducting Qubits*
4. Maximilian Nitsch (Lund University) — *Transport-based fusion that distinguishes between Majorana and Andreev bound states*
5. Tim Pokart (TU Dresden) — *Geometrically Taming Dynamical Entanglement Growth in Purified Quantum States*
6. Samuel Rudge (University of Freiburg) — *Nonadiabatic Dynamics of Molecules Interacting with Metal Surfaces: An Approach Based on Langevin Dynamics and the Hierarchical Equations of Motion*
7. Giulia Salatino (Scuola Superiore Meridionale) — *Unraveling the topological properties of an SSH chain*
8. Erik Samuelsen (TU Delft) — *Andreev molecules at distance*
9. Harald Schmid (Free University Berlin) — *Robust π pairing of Floquet Majorana modes*
10. Adrian Köhler (Free University Berlin) — *Capture Non-Markovian Dynamics with the SSH Method*
11. Christian Ventura Meinersen (…) — *Optimal control of double quantum dot readout*
12. Jonas Vinther (TU Delft) — *Predicting Photon Number Distributions of Multi-Mode Quantum Optics states using Variational Tensor Network Methods*
13. Alvaro Donis Vela (Leiden University) — *Dynamical simulation of the injection of vortices into a Majorana edge mode*
14. Johann Zöllner (University of Duisburg-Essen) — *Stochastic resonance in quantum dots*
15. Arnau Lira Solanilla (Chalmers University of Technology) — *Quantum Fisher Information in the Measurement-induced Phase Transition of Random Circuits*
16. Isak Brundin (Chalmers University of Technology) — *Transferability of Optimal Quantum Approximate Optimization Algorithm Parameters at shallow depths*
17. Nico Ackermann (Autonomous University of Madrid) — *Measurement induced Bell steering for Andreev level qubits*
18. Florian Wallner (Walther Meissner Institute) — *Protected Fluxonium Control via Sub-harmonic Parametric Driving*
19. Aisel Shiralieva (University of Würzburg) — *Non-Hermitian dynamics towards exceptional points*