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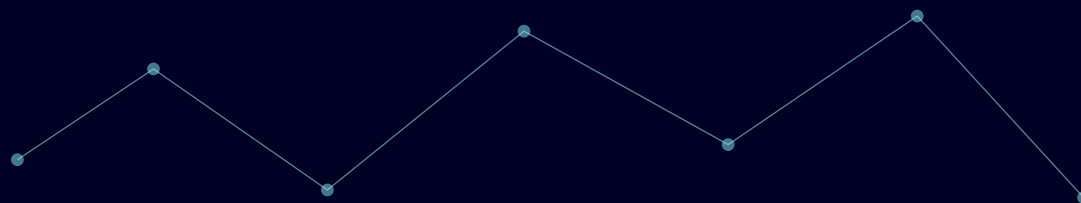
Many-body Open Quantum Systems

QOpen Newsletter

Many-Body Open Quantum Systems

Issue 1

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<https://qopen.eu> | COST Action CA24109



Welcome to the QOpen newsletter for COST Action CA24109 – Many-Body Open Quantum Systems. Each issue will bring together news from across the network, including recent events and research outputs, upcoming meetings and funding opportunities, and updates on regular community activities. We hope it will help members stay connected, discover ways to participate and share the work of the Action.

What has happened so far?

PREPRINTS

Tensor network methods for non-perturbative dynamics of open quantum systems

T. Lacroix et al. | 2026 | [arXiv:2608.09850](https://arxiv.org/abs/2608.09850)

The description of open quantum system dynamics beyond the perturbative treatment (usually associated with Markovian master equations) is a computationally challenging task due to the unfavorable exponential scaling of memory kernels. Developed over recent decades in the context of quantum information and condensed matter, tensor networks provide both a new formalism and a toolbox for overcoming previous computational bottlenecks. This framework enables the formulation of non-perturbative, numerically exact methods for describing the dynamics of open quantum systems to controllable numerical accuracy. In this review, we present these methods and discuss their commonalities and differences to paint a comprehensive view of the field.

STSM REPORT

Spin-chain collision models in Palermo

Report by **Hayden Zammit** | PhD student, University of Malta

Host Salvatore Lorenzo, University of Palermo

When June 10 – 14, 2026

WG WG4 – Methods for Modelling Open Quantum Systems

Scientific objective

The visit aimed to investigate a collision model in which a chain of spin-1/2 systems interacts repeatedly with two streams of ancillas at each end. The objective was to derive the system's master equation and begin studying properties such as its steady state and currents. Palermo was selected for the expertise of Salvatore Lorenzo and colleagues in collisional models.

Main outcomes

The visit established a collaboration between Hayden, Carola Ciaramelletti, Salvatore Lorenzo, Simone Paganelli and Hayden's advisor, Tony J. G. Apollaro. Hayden and Carola found that, for certain types of ancillas, the resulting master equation contains non-local terms—non-zero off-diagonal entries in the Kossakowski matrix. They are continuing to investigate the significance of these terms and their implications for quantum-jump unraveling.

Personal testimonial

The STSM was overall a positive experience, and the group at Palermo was very welcoming. This STSM represented my first experience of visiting another institution with the express purpose of fostering collaboration, and also, my first experience of giving a talk at a foreign institution. It was therefore definitely beneficial to my career and development.

What comes next?

EVENTS

Open Quantum Matter: Characterization and Control

When October 6 – 9, 2026

Where OsloMet, Oslo, Norway

Link [OsloMet](#)

This four-day meeting will bring together researchers from Working Groups 2 and 3 to examine the interface between dissipative quantum matter and the characterization and control of open quantum platforms. Topics include non-equilibrium phases, driven and monitored quantum systems, dissipative stabilization, noisy quantum devices, and strategies for using dissipation as a resource. The meeting is intended to identify common challenges, benchmark problems, and opportunities for follow-up collaborations.

EVENTS

MEOQS2026: Methods for Many-Body Open Quantum Systems

When November 2 – 7, 2026

Where Ettore Majorana Centre, Erice, Italy

Organizers Alberto Biella (CNR-INO & University of Trento) and Cristiano Ciuti (Université Paris Cité)

Link [MEOQS2026](#)

MEOQS2026 will bring together theorists working on numerical and analytical methods for many-body open quantum systems. The meeting follows earlier editions in Vienna, Madrid, Garching, Dundee, and Trento, and is co-organized by the DFG FOR5688 consortium.

OPPORTUNITIES

Calls

QOpen STSM Call – Second Call, Grant Period 1

Deadline • 15 September 2026

QOpen invites applications for Short-Term Scientific Missions (STSMs), supporting short research visits between institutions participating in the Action to foster collaboration, knowledge exchange, and scientific progress. Applications requesting up to €1,000 will be prioritised, although grants of up to €2,000 may be awarded when adequately justified. All STSMs funded through this call must be completed by 15 October 2026.

Applications from Young Researchers and Innovators and from Inclusiveness Target Countries are particularly encouraged.

Applications must be submitted through the COST e-services platform.

<https://qopen.eu/calls/qopen-stsm-call-second-call-grant-period-1/>

OPPORTUNITIES

Positions

Postdoctoral Position in Open Quantum Systems – TU Dortmund (deadline: October 5th, 2026)

A fully funded postdoctoral position is available in the group of Moritz Cygorek at TU Dortmund, Germany, from 1 November 2026 to 31 December 2028. The position is funded at 100% TV-L E13.

The project focuses on tensor-network and path-integral techniques for open quantum systems, including both method development and applications. A central aim is to develop efficient approaches for treating complex environments and extending simulations from few-level systems to quantum networks. The project will also involve collaborations modelling concrete experiments, including quantum-dot-based solid-state cavity-QED devices.

Applicants should have a strong background in open quantum systems and an interest in advanced numerical methods, together with proficiency in Python and/or C/C++. For further information, please contact [Moritz Cygorek](#).

[ACE code and further information](#)

Regular Activities

QOPEN ONLINE COLLOQUIUM

The QOpen Online Colloquium is a monthly online seminar series organized as part of our COST Action. The organizer is Ivana Vasic (Institute of Physics Belgrade). For further information, please contact [the organizer](#).

Past Colloquia

1. 02/09/26

Speaker: *Zala Lenarčič (Jožef Stefan Institute).*

Title: *Approximately conserved quantities in driven-dissipative setups.*

Abstract: *Weak perturbations can induce surprisingly large and robust responses in quantum many-body systems when their dynamics is governed by approximate conservation laws. This talk presents a unified overview of our work on weakly driven quantum systems, focusing on how integrability and near-integrability govern nonequilibrium steady states in the presence of driving and dissipation. First I will develop a general theoretical framework for weakly driven and weakly dissipative quantum systems based on generalized Gibbs ensembles (GGEs), demonstrating that nonequilibrium steady states can be systematically characterized by the slow dynamics of nearly conserved quantities. These exotic nonthermal states give rise to a variety of striking phenomena, including pumping of giant spin and heat currents in quantum spin-chain materials, the occurrence of quantum Mpemba effect, and engineering of nonequilibrium superconductivity. Finally, I will discuss experimental perspectives, ranging from solid-state quantum materials to digital quantum computers, where controlled non-unitary dynamics is implemented through qubit reset protocols.*

CV: *Dr. Zala Lenarčič is a group leader at the Department for theoretical physics at Jožef Stefan Institute. She obtained her Ph.D. from the University of Ljubljana in 2015. Between 2015 and 2018, she conducted postdoctoral research at the University of Cologne. After that, she spent three years as a postdoctoral fellow at the University of California, Berkeley. In 2020 she returned to the “Jožef Stefan” Institute as an independent researcher. She had lead a national project from the Slovenian research agency and was part of two QuantERA consortia on quantum technologies, out of which she was a coordinator of one. In November 2022, she was granted the ERC StG project “Weakly driven quantum symmetries (DrumS).” These successfully obtained projects enabled her to form and lead an independent group, focusing on the non-equilibrium aspects of many-body dissipative quantum systems.*

Next Colloquia

1. 07/10/26, 15:00 CET

Speaker: *Gheorghe Sorin Paraoanu (Aalto University).*

JOURNAL CLUB: LINDBLAD MANY-BODY SYSTEMS

The journal club is held online on Monday mornings (Central European time), with two or three sessions each month. The organizer is Masudul Haque (TU Dresden). To subscribe to the mailing list, please contact [the organizer](#).

Past sessions

1. **14/09/26** — Rafael Soares (MPI-PKS Dresden). *Topological Quantum Synchronization of Fractionalized Spins*. [link](#).

Next sessions

1. **21/09/26** — Giuseppe D'Auria (SISSA). *On the generality of symmetry breaking and dissipative freezing in quantum trajectories*. [link](#).
2. **12/10/26** — Amaury Jean (University of Cambridge). *Exact Solutions of Interacting Dissipative Systems via Weak Symmetries*. [link](#).
3. **19/10/26** — Debabrata Mondal (Tuebingen). *Measurement-Induced Quantum Synchronization and Multiplexing*. [link](#).
4. **26/10/26** — Klee Pollock (Ljubljana). *tbd*.
5. **09/11/26** — Weyner Ccuiro (SISSA). *tbd*.

JOURNAL CLUB: PROCESS TENSOR

This online journal club meets on the first Monday of each month at 4pm (UK time). The journal club is organized by Brendon Lovett (University of St Andrews). To subscribe to the mailing list, please contact [the organizer](#).

Past sessions

1. **03/08/26** — Peter Kirton (University of Strathclyde). *Belief propagation and tensor networks*. [link](#).
2. **07/09/26** — Hari Kumar Yadalam (King's college London). [link](#).

Next sessions

1. **05/10/26** — *tbd*

Next newsletter

The next issue is planned for **November 2026**. If you have an item for the newsletter, please [contact us](#).

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