



Neutral Atom Quantum Computing

EuRyQa conference, 10-11 March

Institute of Supramolecular Science and Engineering (ISIS)

8 All. Gaspard Monge, 67000 Strasbourg

Tuesday, 10 March

9:00-9:45

Registration + Coffee

9:45-10:00

Welcome and Introduction

10:00-10:30	Quantum Computing with metastable Sr atoms Johannes ZEIHNER <i>Max Planck Institute of Quantum Optics, Germany</i>	O1
10:30-10:50	Manipulating the Sr fine structure qubit in large tweezer arrays Tilman PFAU <i>University of Stuttgart, Germany</i>	O2
10:50-11:10	Towards fault-tolerant quantum computing using neutral atoms Pauline MATHIOT PASQAL , <i>France</i>	O3
11:10-11:30	Two- and multi-qubit Rydberg quantum gates between distant atoms David PETROSYAN FORTH / <i>Institute of Electronic Structure and Laser, Greece</i>	O4
11:30-11:50	Fast Quantum Gates for Neutral Atoms Separated by a Few Tens of Micrometres Matteo BERGONZONI <i>University of Strasbourg, France</i>	O5
11:50-12:10	Designing continuous multi-qubit gates for neutral atoms Raul DOS SANTOS <i>Technical University of Eindhoven, The Netherlands</i>	O6

12:15-14:00

Lunch (6th floor)

	t.b.c.	
14:00-14:30	Markus MÜLLER <i>RWTH Aachen University and Forschungszentrum Jülich, Germany</i>	O7
14:30-14:50	Towards quantum computing with qLDPC codes Laura PECORARI <i>University of Strasbourg, France</i>	O8
14:50-15:10	Color Code threshold estimation with non-Pauli noise via tree tensor networks Francesco Pio BARONE <i>University of Padova, Italy</i>	O9
15:10-15:30	Pushing the Limits of Simulation for Fault-Tolerant Quantum Computing Asier PINEIRO ORIOLI <i>QPerfect, France</i>	O10
15:30-15:50	Emergent symmetry breaking in quantum circuit transpilation Andrea DE GIROLAMO <i>University of Padova, Italy</i>	O11
15:50-16:10	Energetics of Rydberg-atom Quantum Computing Yasser OMAR <i>IST, ULisbon & PQI – Portuguese Quantum Institute, Portugal</i>	O12

16:10-18:00

Poster session

Quantum Simulation Imad Eddine CHORFI <i>University of Constantine 1, Algeria</i>	P1
Coherent clock-Rydberg Rabi oscillations on Sr atoms in optical tweezers Marijn VENDERBOSCH <i>Technical University of Eindhoven, The Netherlands</i>	P2
Combining atomic ensembles with single atoms to realize collectively enhanced detection using EIT Lew SCHÖNE <i>University of Strasbourg, France</i>	P3
Enhancement of Rydberg Excitation in a Cavity QED Experiment Florian JELONNEK <i>University of Tübingen, Institute of Physics, Germany</i>	P4
Non-equilibrium dynamics of long-range interacting quantum systems Paul HAMPP <i>University of Tübingen, Germany</i>	P5
Multi-qubit Rydberg gates between distant atoms Antonis DELAKOURAS <i>FORTH / Institute of Electronic Structure and Laser, Greece</i>	P6
Fundamental bound on entanglement generation between interacting Rydberg atoms Georgios DOULTSINOS <i>FORTH / Institute of Electronic Structure and Laser, Greece</i>	P7
Measurement of Rydberg laser frequency noise and its effect on decoherence Boris ALBRECHT <i>PASQAL, France</i>	P8
Laser Physics for Coherent Rydberg Gates on Rb qubits van der Werf YURI <i>Technical University of Eindhoven, The Netherlands</i>	P9
Benchmarking neutral atom-based quantum processors at scale Andrea RAVA <i>Forschungszentrum Jülich, Germany</i>	P10
Pontryagin Maximum Principle for Rydberg-blockaded state-to-state transfers: A semi-analytic approach Federico ASTOLFI <i>University of Strasbourg, France</i>	P11
Gate Fidelity Enhancement in a Strontium-87 Quantum Processor Samed ERSEYMEN <i>University of Tübingen, Germany</i>	P12
General Circuit Mapping Solution For Neutral Atom Quantum Computers Neven GENTIL <i>Technical University of Eindhoven, The Netherlands</i>	P13
Quantifying register errors and their impact on computations on a neutral-atom QPU Julien RIPOLL <i>PASQAL, France</i>	P14
Efficient Sampling for Noisy Quantum Circuits Santiago HIGUERA <i>University of Stuttgart, Germany</i>	P15
Blueprint for a neutral atom quantum computer Shannon WHITLOCK <i>University of Strasbourg, France</i>	P16
Fault tolerant compilation of algorithms to neutral atom quantum computers Tom HARTWEG <i>University of Strasbourg, France</i>	P17
Possibility of a variational quantum algorithm with neutral atoms and applications to many-body physics Samuel Aychet-Claisse <i>Laboratory of the Physics of the two Infinities Irène Joliot-Curie, France</i>	P18

Optimal Pulses for a fast Circularization of Interacting Rydberg Atoms Matthias HUELS <i>Forschungszentrum Jülich GmbH - PGI 8, Germany</i>	P19
Dark-state semi-localization and subradiance in dissipative systems Raphaël MENU <i>University of Strasbourg, France</i>	P20

19:00 Dinner at the restaurant ([L'Ancienne Douane à Strasbourg](#))

Wednesday, 11 March

9:00-9:30	Studying doped magnets with a Rydberg quantum simulator Antoine BROWAEYS <i>Institut d'Optique, France</i>	O13
9:30-9:50	Circular Rydberg states for quantum simulation Florian MEINERT <i>University of Stuttgart, Germany</i>	O14
9:50-10:10	Dynamics across quantum phase transitions in Rydberg atom arrays Simone NOTARNICOLA <i>University of Padova, Italy</i>	O15
10:10-10:30	Suppressing crosstalk for Rydberg quantum gates Sebastian WEBER <i>University of Stuttgart, Germany</i>	O16
10:30-10:50	W and Dicke states engineering using optimal control in neutral atoms qubit arrays Andrea MURATORI <i>University of Bologna, Italy</i>	O17

10:50-11:10 Coffee-break

11:10-11:40	Resource-State Quantum RAM for Fast and Error-Correctable Queries Francesco CESA <i>Institute for Quantum Optics and Quantum Information, Austria</i>	O18
11:40-12:00	Building very large registers with >1000 atoms on neutral-atom hardware Hadriel MAMANN <i>PASQAL, France</i>	O19
12:00-12:20	Parallel neutral atom rearrangement with an ultra-fast spatial light modulator Yu Chih TSENG <i>University of Amsterdam, The Netherlands</i>	O20
12:20-12:40	Digital Twin based optimisation of Rydberg Atom Quantum Computers Anurag SAHA-ROY <i>QRUISE, Germany</i>	O21
12:40-13:00	Rydberg Simulation Platform: A versatile digital-twin for Neutral Atom Quantum Computers Emre AKATURK <i>Technical University of Eindhoven, The Netherlands</i>	O22

13:00-14:30 Lunch (6th floor)

14:30 Bus from ISIS to CESQ

15:00-16:00 Lab-tour at [CESQ \(23 Rue du Loess, 67200 Strasbourg\)](#)

16:00 End of the conference



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