

Quantum Autumn School 2025

Date:
Nov 3-7, 2025

organisers: ENCCS,
NCC Denmark, NCC
Lithuania

Monday 3rd

arrival and coffee 8:30-9:20	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00
Welcome! QAS2025 Introduction Karim Elgammal (ENCCS/RISE, SE)	Introduction to variational quantum algorithms: VQE, QAOA and beyond (QPE, ..., SQD) Juan de Gracia Triviño (ENCCS/RISE, SE)	Variational Algorithms; Designing use cases for near term quantum algorithms Panagiotis Barkoutsos (IonQ)	Scaling up ion trap quantum computers and quantum technologies; the case of IonQ Panagiotis Barkoutsos (IonQ)	Quantum Neural Networks Stefano Markidis (KTH, SE)

Introduction to the European
Hybrid classical/quantum
HPC+AI+QC ecosystem.
LUMI-Q Quantum Flagship

Mikael Johansson
(CSC, FI)

coffee break
10:40-11:00

Overview of the HPC/QC
software stack, from
ready-made Q-libraries
for common tasks to
circuit level assembly and
hardware-level coding

Miroslav Dobsicek

Tuesday 4th

coffee/sandwich 8:30-9:00	Introduction to variational quantum algorithms: VQE, QAOA and beyond (QPE, ..., SQD) Juan de Gracia Triviño (ENCCS/RISE, SE)	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00
interactive tutorial: experiments with quantum gates, circuits and algorithms (qrsp simulation) Juan de Gracia Triviño (ENCCS/RISE, SE)	Controlling a quantum computer using pulses Stefan Seegerer (IQM)	Atomistic simulations on quantum accelerated supercomputing Karim Elgammal, Marc Maußner (ENCCS/RISE, SE) (infoteam, DE)	hands-on QNNs using pennylane/classification (tutorial) Stefano Markidis (KTH, SE)	

coffee break
10:40-11:00

Opportunities for
extending quantum
computing through
subspace, embedding
and classical molecular
dynamics techniques

Thomas M. Bickley
(UCL, UK)

Wednesday 5th

coffee/sandwich 8:30-9:00	Variational Algorithms; Designing use cases for near term quantum algorithms Panagiotis Barkoutsos (IonQ)	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00
LUMI-Q/VLQ presentation Miroslav Dobsicek	Accelerated Quantum Supercomputing using NVIDIA CUDA-Q Esperanza Cuenca-Gómez (NVIDIA)	Quantum Reservoir computing Ruben Pariente Bassa (SINTEF, NO)		

coffee break
10:40-11:00

LUMI-Q/VLQ presentation

Miroslav Dobsicek

Lunch

Thursday 6th

coffee/sandwich 8:30-9:00	Scaling up ion trap quantum computers and quantum technologies; the case of IonQ Panagiotis Barkoutsos (IonQ)	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00	coffee/sandwich 8:30-9:00
Atomistic simulations on quantum accelerated supercomputing 10:00-10:40 Karim Elgammal, Marc Maußner (ENCCS/RISE, SE) (infoteam, DE)	hands-on QNNs using pennylane/classification (tutorial) 10:00-10:40 Stefano Markidis (KTH, SE)			

coffee break
10:40-11:00

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Accelerated Quantum
Supercomputing using
NVIDIA CUDA-Q

Esperanza
Cuenca-Gómez
(NVIDIA)

Quantum Reservoir
computing

Ruben Pariente Bassa
(SINTEF, NO)

closing

The end

coffee break

coffee break

coffee break

**Towards 2045: Do
we still only talk
about Quantum
superiority?**

Panel discussion
Göran Wendum
(RISE, SE)

**PechaKucha
presentations**

**(in-person
only)**

**Buffé
dinner**

coffee break

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