

Quantum Autumn School 2025		
Date: Nov 3-7, 2025	location: RISE KTH at "Innoversum" room	organisers: ENCCS, NCC Denmark, NCC Lithuania

		Monday 3rd	Tuesday 4th	Wednesday 5th	Thursday 6th	Friday 7th
slot 1	9:00-10:00	arrival and coffee 8:30-9:15	Introduction to variational quantum algorithms: QAOA  Franz Fuchs (SINTEF, UiO, NO)	Introduction to variational quantum algorithms: VQE and beyond (QPE, ..., SQD)  Juan de Gracia Triviño (ENCCS/RISE, SE)	introduction toTrapped-ion  Panagiotis Barkoutsos (IonQ)	Quantum Neural Networks  Stefano Markidis (KTH, SE)
		Welcome! ENCCS & QAS2025 Introduction  Karim Elgammal (ENCCS/RISE, SE)				
		Introduction to MIMER AI Factory  Thor Wikfeldt (MIMER/RISE, SE)				
slot 2	10:00-11:00	Introduction to the European Hybrid classical/quantum HPC+AI+QC ecosystem. LUMI-Q Quantum Flagship  Mikael Johansson (CSC, FI)	In-depth description of variational quantum algorithms: QAOA  Franz Fuchs (SINTEF, NO)	VQE applied to use cases for quantum chemistry/drug discovery: in-depth description of specific use case  Panagiotis Barkoutsos (IonQ)	Atomistic simulations on quantum accelerated supercomputing  10:00-10:40 Karim Elgammal, Marc Maußner (ENCCS/RISE, SE) (infoteam, GER)	hands-on QNNs using pennylane/classification (tutorial)  10:00-10:40 Stefano Markidis (KTH, SE))
			coffee break 10:40-11:00	coffee break 10:40-11:00	coffee break 10:40-11:00	coffee break 10:40-11:00
slot 3	11:00-12:00	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	Opportunities for extending quantum computing through subspace, embedding and classical molecular dynamics techniques  Thomas M. Bickley (UCL, UK)	Controlling a quantum computer using pulses  Stefan Seegerer (IQM)	Accelerated Quantum Supercomputing using NVIDIA CUDA-Q  Esperanza Cuenca-Gómez (NVIDIA)	Quantum Reservoir computing  Ruben Pariente Bassa (SINTEF, NO)
	12:00-13:00	Lunch	Lunch	Lunch	Lunch	Lunch
slot 4	13:00-14:00	Quantum gates, circuits and algorithms  Juan de Gracia Triviño (ENCCS/RISE, SE)	Getting started with algorithm development on actual quantum hardware using IQM Resonance  Stefan Seegerer (IQM)	How to use quantum computers for biomolecular free energies  Matthias Christandl (København U, DK)	Quantum error-correction (QEC)  Mats Granath (Göteborg University)	closing  The end
slot 5	14:00-15:00	Quantum gates and circuits  Giulia Ferrini (MC2, Chalmers, WACQT, SE)	Developing quantum algorithms with qrisp, the next generation of quantum algorithm development  Stefan Seegerer (IQM)	interactive tutorial on the devices (LUMI-Q/IQM devices)  Miroslav Dobsicek	Quantum kernel estimation with application to disability insurance  Björn Löfdahl (SEB)	
				Pre-panel discussion  Göran Wendin (RISE, SE)		
	15:00-15:30	coffee break	coffee break	coffee break	coffee break	
slot 6	15:30-16:30	Quantum Information Theory introduction, building quantum algorithm, QFT, ...  Stefano Markidis (KTH, SE)	interactive tutorial: experiments with quantum gates, circuits and algorithms (qiskit/qrips simulation)  Juan de Gracia Triviño (ENCCS/RISE, SE)	Towards 2045: Do we still only talk about Quantum superiority?  Panel discussion Göran Wendin (RISE, SE)	interactive tutorial: Quantum error-correction (QEC) hands-on  Moritz Lange (Göteborg University)	
slot 7	16:30-17:30	From qubits 2000 to Nobel Prize 2025  Göran Wendin (RISE, SE)	interactive tutorial: Execution of simple examples on optimisation with QAOA (simulation)  Franz Fuchs (SINTEF, NO)	PechaKucha presentations	interactive tutorial: Quantum kernel estimation with application to disability insurance  Björn Löfdahl (SEB)	
	18:00-20:00	Reception, mingling		Buffé dinner		