# Nordic Quantum Autumn School 2025 (draft timetable)

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 9:00-9:30<br>**Welcome & Introduction to QAS2025** 9:00-10:00 Thor Wikfeldt (ENCCS/RISE, SE) | **Introduction to variational quantum algorithms: QAOA** Franz Fuchs (SINTEF, UiO, NO) | **Introduction to variational quantum algorithms: VQE and beyond (QPE, ..., SQD)** Juan (ENCCS, RISE, SE) | **introduction toTrapped-ion** Panagiotis Barkoutsos (IonQ) | **Quantum Neural Networks** Stefano Markidis (KTH, 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** 10:00-10:40 Franz Fuchs (SINTEF, NO)<br>coffee break 10:40-11:00 | **VQE applied to use cases for quantum chemistry/drug discovery: in-depth description of specific use case** 10:00-10:40 Panagiotis Barkoutsos (IonQ)<br>coffee break 10:40-11:00 | **Atomistic simulations on quantum accelerated supercomputing** 10:00-10:40 Karim (ENCCS/RISE, SE)<br>coffee break 10:40-11:00 | **hands-on QNNs using pennylane/classification (tutorial)** 10:00-10:40 Stefano Markidis (KTH, SE))<br>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** EuroQHPC Miroslav Dobsicek (Chalmers Next Labs, SE) | **Getting started with algorithm development on actual quantum hardware using IQM Resonance** Stefan Seegerer (IQM) | **High Ground State Overlap via Quantum Embedding Methods** Matthias Christandl (København U, DK) | **Accelerated Quantum Supercomputing using NVIDIA CUDA-Q** Esperanza Cuenca-Gómez | **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 and circuits** Giulia Ferrini (MC2, Chalmers/WACQT, SE) | **Developing quantum algorithms with qrisp, the next generation of quantum algorithm development** Stefan Seegerer (IQM) | **Controlling a quantum computer using pulses** Stefan Seegerer (IQM) | **Quantum error-correction (QEC)** Mats Granath (Göteborg University) | **Towards 2045: Do we still talk about Quantum superiority?** Panel discussion |
| slot 5 14:00-15:00 | **Quantum gates, circuits and algorithms** Giulia Ferrini, Laura Garcia Alvarez (MC2, Chalmers/WACQT, SE) | **interactive tutorial:** experiments with quantum gates, circuits and algorithms (qiskit simulation) tutorial, simulation (Laura) | **interactive tutorial on the devices (LUMI-Q/IQM devices)** Stefan Seegerer (IQM) | **quantum monte carlo and quantum finance** Björn Löfdahl (SEB) | closing<br>The end |
| 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:** Execution of simple examples on optimisation with QAOA (simulation) hands-on (Franz) | **interactive tutorial:** experiments with quantum gates and quantum circuits for VQE (simulation) tutorial, Juan | **interactive tutorial:** Quantum error-correction (QEC) hands-on Mats Granath team (Göteborg University) | |
| slot 7 16:30-17:30 | **Quantum error mitigation (QEM) applied to simulation of physical systems** Göran Wendin (RISE, SE) | **interactive tutorial:** Execution of simple quantum chemistry examples using VQE on simulation vs. LUMI-Q/IQM hands-on (IQM team) | **interactive tutorial:** Quantum finance, Classical Monte Carlo on a QC, Quantum Amplitude Estimation (QAE) Björn Löfdahl & team | | |
| 18:00-20:00 | Reception, mingling | Buffé dinner | PechaKucha presentations and posters | | |