

Quantum Technology for Chemicals and Materials

Quantum Technology

A four-hour course on the industry with the strongest case for quantum advantage. We cover catalysts, battery materials and correlated materials, how to read a resource estimate, and what to prepare now.

Duration

4 hours

Short professional course

Level

Executive

No prerequisites

On-demand fee

US\$399

Online on-demand

Read the estimates. Choose the problems.

What you will learn

- ✓ Explain why chemistry has the strongest case for quantum advantage, and where that case ends
- ✓ Read a resource estimate and judge when a target molecule becomes feasible
- ✓ Tell a gain over earlier quantum methods from a gain over the best classical method
- ✓ Identify the problems in your portfolio that are candidates for quantum simulation
- ✓ Compare quantum simulation with the AI and HPC methods advancing in parallel
- ✓ Plan the skills, workflows and partnerships to have in place by the end of the decade

Who should attend

R&D directors, heads of computational chemistry and materials modelling, innovation leads, executives and program managers at chemical, materials, battery and specialty-chemicals companies. Also useful for investors and consultants who assess materials technologies.

Prerequisites

None. No technical background is assumed.

Why Quantum Academy

Quantum Academy teaches from *Quantum Systems Integration*, written by the course author, and faculty experience with quantum engineering and integration teams. Hardware results, announcements and resource estimates are clearly distinguished.

What you will study

5 modules · 4 hours · No exam

01 Judging Quantum Claims – 45 minutes

Separate hardware results, announcements and estimates; distinguish physical from logical qubits. Test classical baselines, including why a reported catalyst speedup over earlier quantum methods does not establish an advantage over classical methods.

02 Quantum Simulation of Molecules and Materials – 75 minutes

Cover catalysts, battery cathodes, photosensitizers, correlated materials, phase estimation and hybrid methods. Read logical qubits, gate counts, runtime and accuracy. Most chemistry will keep running on classical computers and AI, and we expect the first quantum results on specific problems: catalysts, battery cathodes, photosensitizers and correlated materials. We estimate that building the skills and workflows to use those results takes two to five years.

03 Hybrid Workflows, Sensing and Data – 45 minutes

Examine quantum solvers within classical HPC, fragmentation errors and competing AI methods. Cover NV-diamond microscopy for materials characterization and protection of long-lived R&D data.

04 What Chemical and Materials Companies Are Doing – 30 minutes

Review BASF, BMW, Airbus, Boehringer Ingelheim, Oak Ridge National Laboratory, Johnson Matthey, Mitsubishi Chemical and JSR programs. Distinguish hardware results, announcements and estimates.

05 Preparing Now – 45 minutes

Score problems on value, classical difficulty and quantum resources. Connect computational and bench teams, plan skills and partnerships without single-vendor lock-in, and draft a one-page brief for R&D leadership.

Formats and fees

Online on-demand	US\$399
Live online	US\$599
In person	US\$799
Private team training	Custom quote

What is included

- Course handbook: full material with written instructor notes.
- Use-case table with sources and results labelled as demonstrated, announced or estimated.
- PDF copy of *Quantum Systems Integration*, written by the course author.
- 180 days of access to the online on-demand course.

Upon completion, you receive a Quantum Academy certificate of completion. It confirms that you completed the course and is separate from Quantum Academy's professional certifications.

Explore the course

See dates and enroll on the course page.

quantumacademy.com/courses/quantum-technology-chemicals-materials/



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