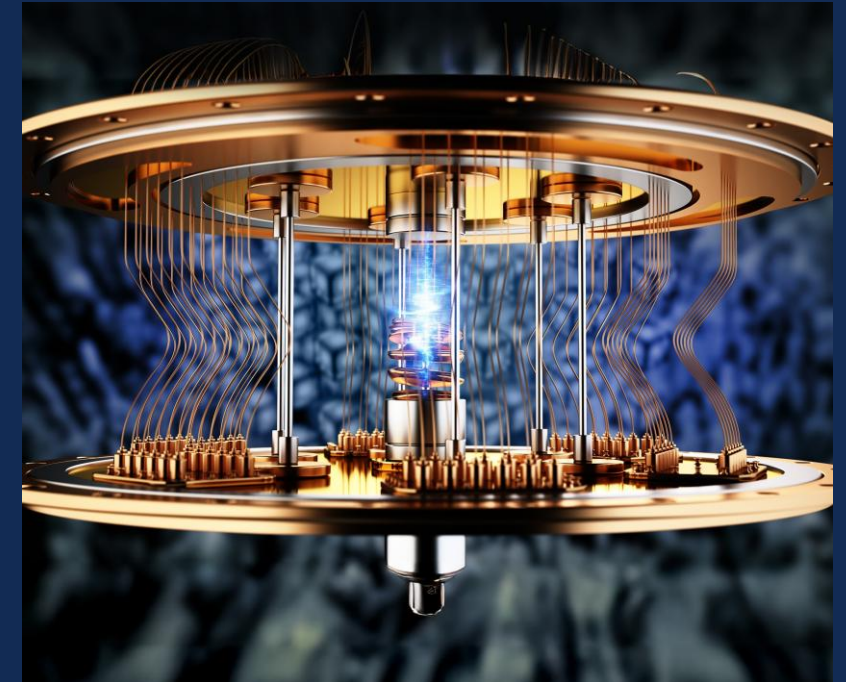


An insurer's quantum journey: strategy, roadmap, projects

Quantum computing will hit key insurance and financial processes.
We're building capability **now**, so we're ready when the hardware
catches up.

strategy / roadmap / projects and partners



Understand what quantum computing does today, and turn that into opportunity

The Quantum Hub runs 3 missions under one mandate

WHY

- Build our own understanding of quantum computing, what it does today, what it doesn't, where it's headed
- Drive the experimentation that turns that understanding into business opportunities for Allianz

HOW

Run Experiments

Run experiments on real Allianz problems under a tuned classical benchmark rule

Build expertise and network

Build internal expertise and engage the ecosystem: hardware, algorithms, venture capital, academia, institutions

Inform decisions

Deliver insights and solution scenarios for C-level decisions



3 pillars run beneath one thesis

Allianz believes quantum computing will impact key insurance and financial processes and is building capability now, so the group is ready when the technology matures

1 Build value

Offensive applications. POC playgrounds where quantum methods could give Allianz an edge once the hardware is there

5 areas explored today (non-exhaustive)

- NatCat tail risk
- Cyber anomaly detection
- Asset and liability management
- Portfolio optimization
- Risk assessment

2 Build network

Continuous tech and ecosystem watch. Working partnerships across 3 layers

3 partnership layers (for example)

Industrial
IQM, Multiverse Computing

Academic
LMU Munich QAR-Lab, CentraleSupélec

Institutional
Banque de France

3 Inform decisions

Deliver insights and solution scenarios for C-level decisions via C-Level Briefings, Top Exec introductions and trainings, and Monthly discovery sessions

From discovery to decision



Lead time on capabilities and algorithms is the constraint, not the hardware



4 kinds of value that Allianz keeps, across 9 projects



Value kept

Problem formulations

Real Allianz problems stated for today's or tomorrow's computers

Quantum models tested

Built end to end, on public, simulated, and Allianz data

Partner network

7 external partners, co-funded research, published work, machine access

Better classical models

Reformulating a problem exposes corrections, ready for model owners

Value marks:

● formulation

● model tested

● partner network

● classical correction

● filled = present ○ outline = pending

NatCat & climate

Hail pricing

CentraleSupelec

● ● ● ○

Synthetic hail data

CentraleSupelec

● ● ● ○

Hail forecasting

CentraleSupelec

● ● ● ○

Hail-track grouping

CentraleSupelec

● ● ● ○

Systemic hail risk

LMU

● ○ ○ ○

Flood mapping

QbitSoft

● ● ● ○

Cybersecurity & fraud

Hidden intrusion detection

IQM, Multiverse Computing

● ● ● ●

Generative anomaly detection

LMU

● ● ● ○

Data protection

Post-quantum protection of regulatory transfers

Banque de France / CryptoNext Security

● ● ● ●

first experiment: next to run, outside the 9

Financial risk & ALM

Allianz internal: AIM

○ ○ ○ ○

Largest insured weather peril in Germany. 4 building blocks of hailstorm modelling explored in parallel with CentraleSupelec.

QUBO CLUSTERING

Detecting hail tracks across radar data.

Baseline: DBSCAN (production).

Matches DBSCAN today, scales better as sensor density grows.

QNN FORECASTING

8-qubit ansatz on a small event dataset.

Baseline: random forest and CNN.

84% precision, encouraging on data-poor regimes.

QCBM JOINT DISTRIBUTION

How hail variables co-move at the tail.

Baseline: vine copula, AZRe Hail Germany 2023.

Closes the gap on tail mass, competes with the production vine.

QCBM SYNTHETIC DATA

Generative pipeline for synthetic hail events, paired with VQ-VAE, end to end on real IBM Quantum hardware.

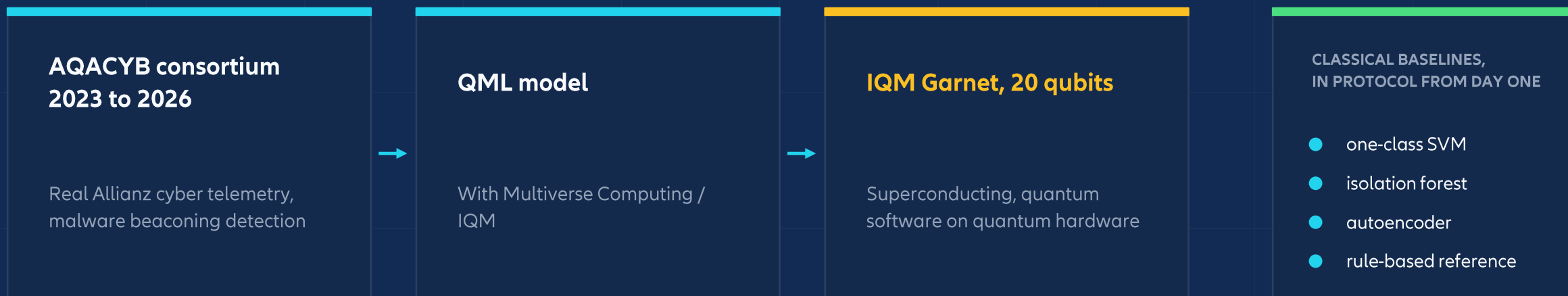
Baseline: classical generative pipeline.

Quantum software running on quantum hardware, today.

Promising results across the 4 angles. Next round is the LMU systemic-hail study, 6 months, peer-reviewed paper at the end

QML on real Allianz cyber telemetry, classical baselines from day one

Cyber lighthouse: AQACYB on IQM Garnet



Encouraging early results. The case for continued QML / Quantum Feature Map for cyber anomaly detection research stands

4 ALM modules, 4 candidate quantum method families

Scoping work, financial-side counterpart to NatCat.



scoping today, POC tomorrow

same baseline-first discipline, POC selection through 2026 and 2027

Today's supplier choice is a judgement call

PHASE 1 OF 3

discovery, experimentation, familiarization

OBJECTIVE

Explore quantum computing and become familiar with different approaches and qubit modalities

At this stage we assess suppliers predominantly on qualitative grounds, reputation and fit

criterion

what we assess it through

- | | | |
|---|---|--|
| 1 | Algorithmic expertise relevant to insurance business challenges | Market reputation. Previous experience with financial-services or insurance organizations. Support from reputable investors. Scientific publications |
| 2 | Ability to support the selection and definition of experiments | Adapts to our specific business problems. Declines to push a standard, pre-existing or previously tested solution that does not directly address our needs |
| 3 | Ease of access to a cloud-based testing platform | We open an account and run a first job ourselves |
| 4 | Ease of use for users who are not quantum-computing experts | Our actuaries and data scientists can run it without a specialist beside them |
| 5 | Ability to test across different hardware platforms and qubit modalities | The same problem runs across at least 2 modalities |

EUROPEAN PRESENCE

Where possible, a local presence in France, Germany or Europe. It supports the European quantum ecosystem and Europe's long-term sovereignty in a strategically important technology domain, and proximity helps delivery. **A preference between comparable suppliers.**

Criteria get more demanding as our commitment grows



	PHASE 2 POCs and early quantum-advantage announcements objective: Build valuable and reusable intellectual property	PHASE 3 FTQC regime and production deployment objective: Measured business return in production
Supplier and deployment	A major player: size, number of customers, market recognition, ecosystem integration, demonstrated partnerships, influence on the sector's direction	Ease of integration into our infrastructure. Production-grade solutions with measurable business advantage. Return on investment through lower cost, faster execution, better quality
Hardware	Credible roadmap backed by peer-reviewed or independently validated evidence. Credibly positioned toward FTQC. QPUs easy to access. Competitive pricing. Integrates into high-performance computing environments	Qubit characteristics match our performance requirements and operating conditions. CPU, GPU and QPU orchestration validated by the community
Software	Development platform easy to access. Connects to the main quantum hardware providers and supports different qubit modalities. Demonstrated algorithm performance. Algorithm quality recognized through peer-reviewed publications	→ Carries forward from phase 2
Cross-cutting	Willingness to build long-term partnerships. Financial strength. Nice to have: demonstrated competitive business advantage in insurance or financial services	→ Carries forward from phase 2

both rows: major results published, demonstrated and validated by the scientific or technical community

We move to phase 2 on 1 monitored signal: a result independently reproduced on a problem class we price or reserve against

Allianz believes quantum computing will impact key insurance and financial processes and is building capability now so the group is ready when the technology matures

The Hub exists because readiness takes time

These projects help us separate real progress from market noise

When quantum becomes relevant at scale, Allianz will not start from zero

Thank you. Happy to take questions.



Olivier Salomon

Head of Quantum Technologies Hub | DeepTech & Innovation expert @ Cybersecurity and NextGenIT...



Please Connect