PASQAL

QUANTUM DISCOVERY

Quantum computing as a service

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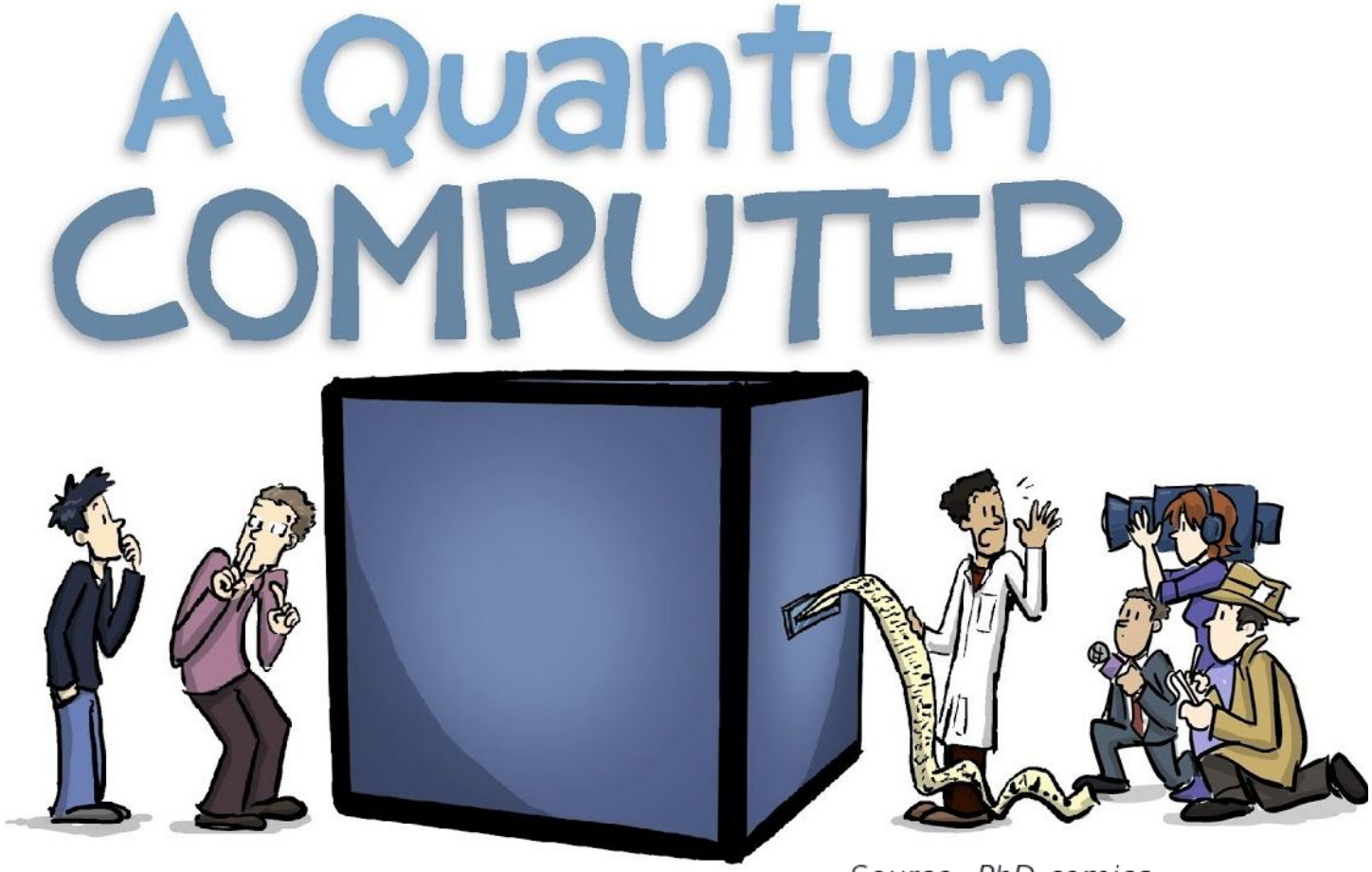
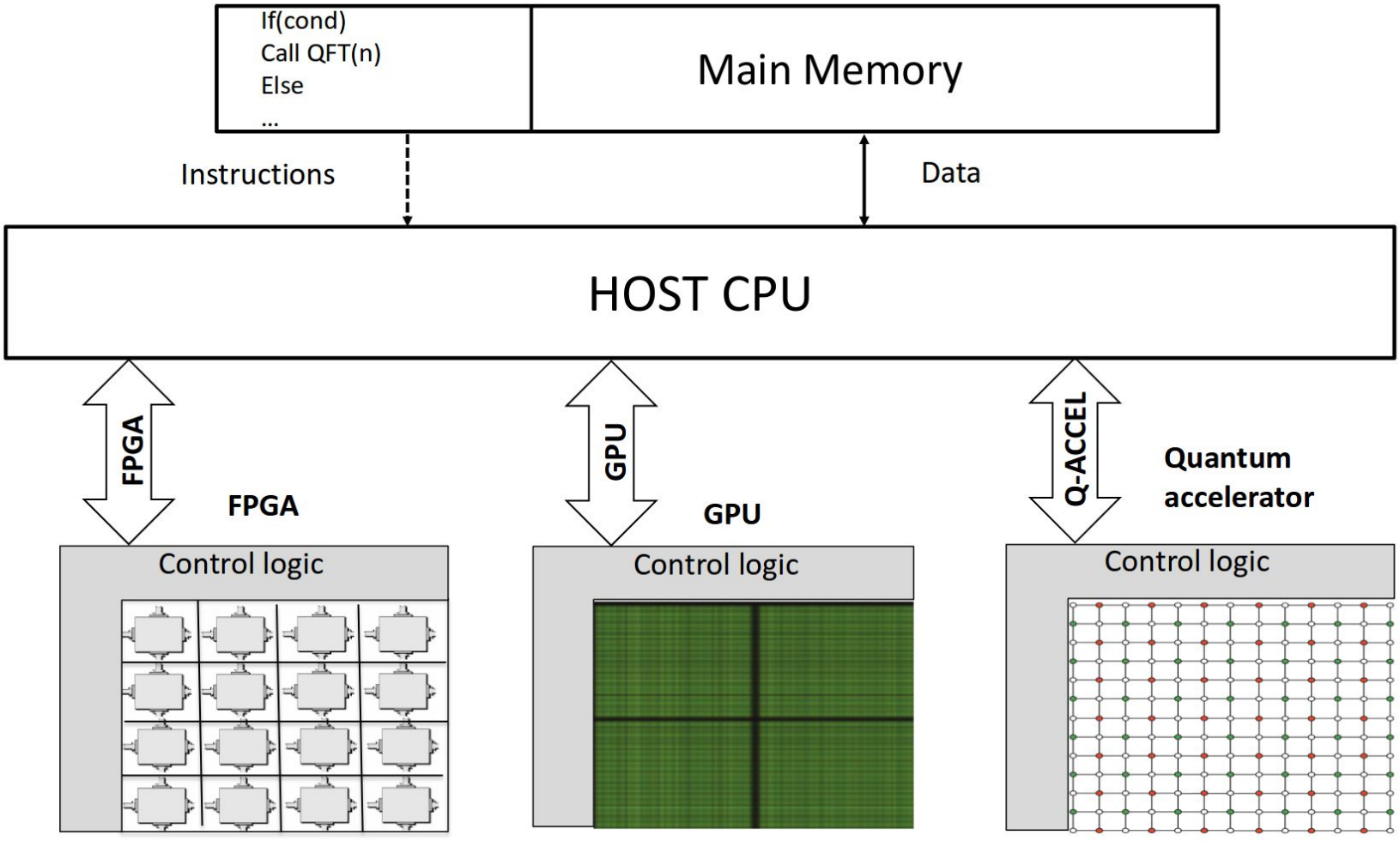
Quantum “computer” or quantum “accelerator” ?



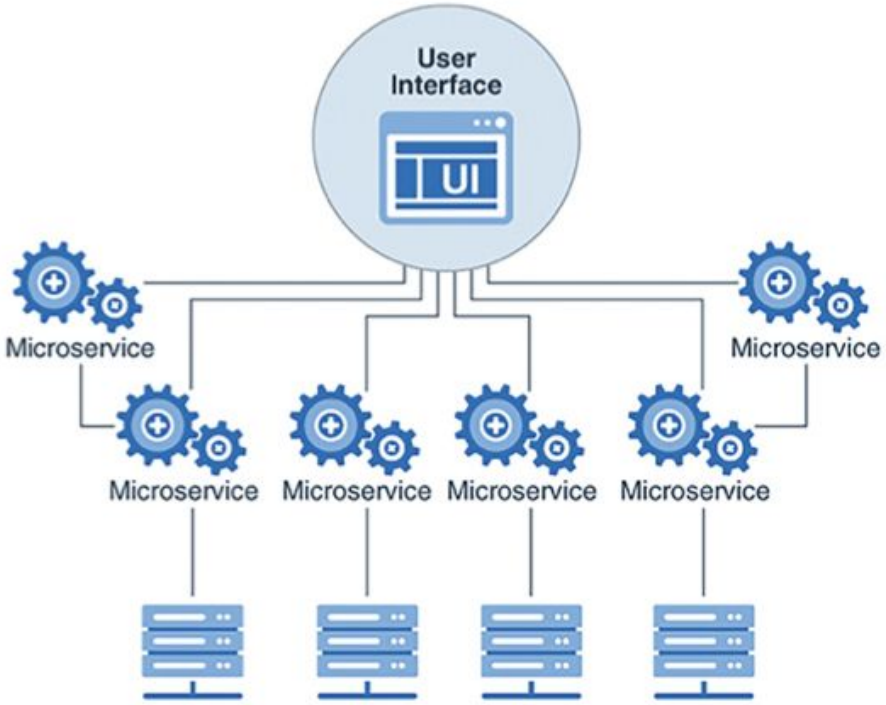
Source: PhD comics

Heterogeneous multicore architecture

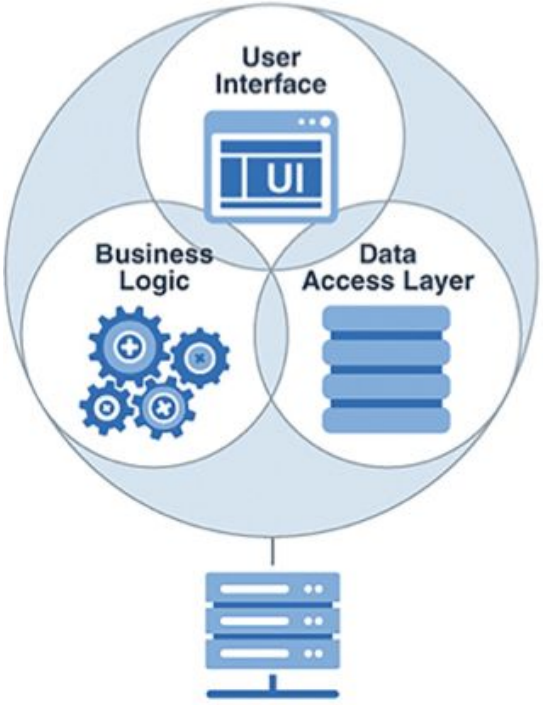


Microservice architecture

Microservice architecture

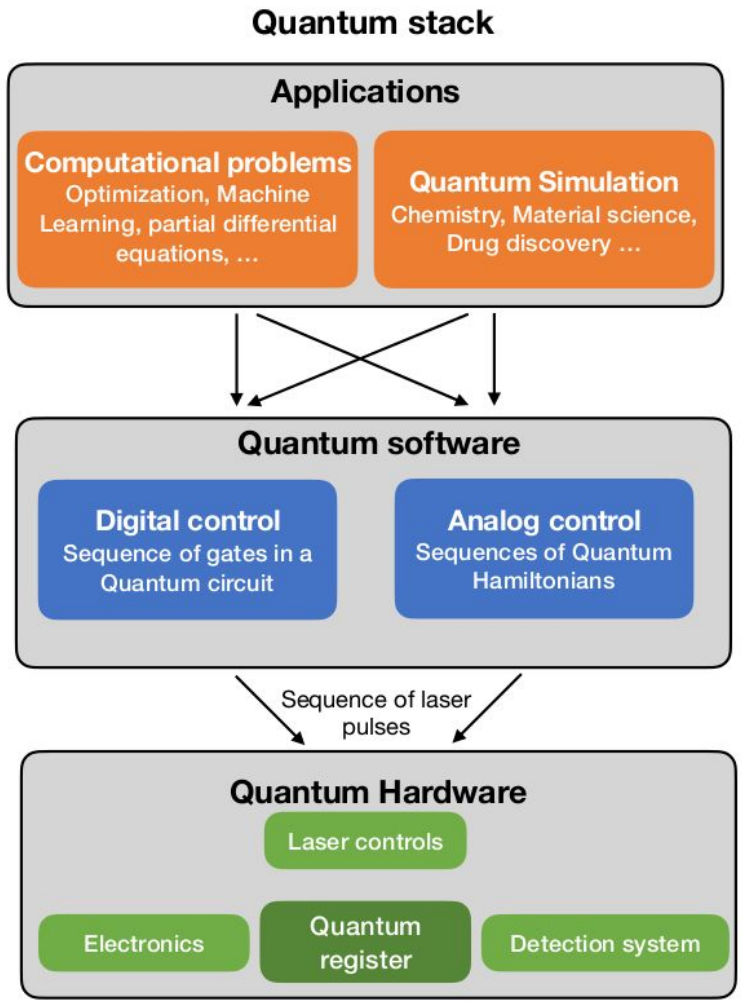


Monolithic architecture



Cloud quantum computing

Quantum computing workflow



Metrics

Quality, speed or reliability of the procedure in comparison with state-of-the art classical methods

Complexity of the procedure, and/or gate count

Number of atoms, gate fidelity $\mathcal{F}$ quality factor $\mathcal{Q}$, and repetition rate of the QPU

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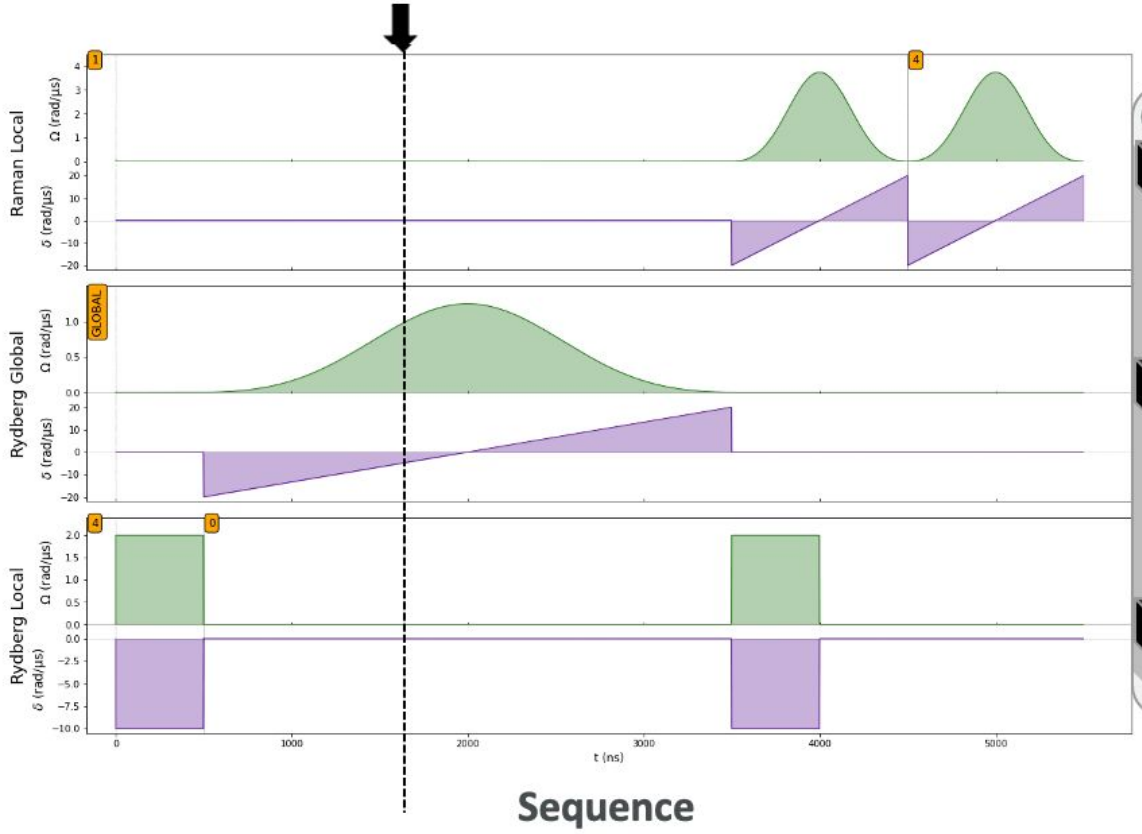
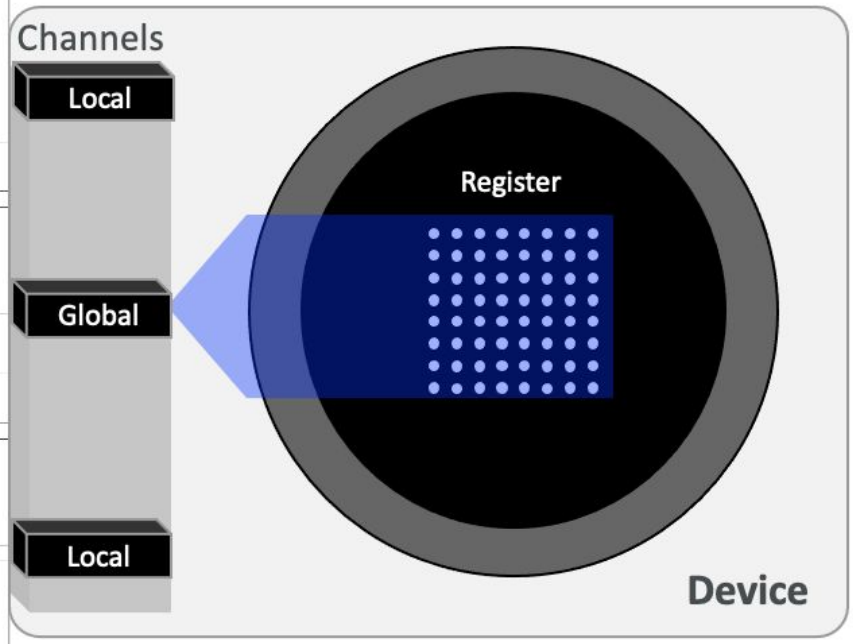
Application domain libraries

Pulser: library for pulse-level/analog control of neutral atom devices





Conclusion

- ➔ Quantum computers are co-processors
- ➔ The solving of many hard computational problem across industries can be accelerated with quantum computers
- ➔ To run quantum algorithms, cloud quantum services such as “Pulser Studio” offer access to quantum processors and emulators
- ➔ Programming quantum computers requires domain specific libraries and programming languages
- ➔ Digital and analog quantum computing are two different and complementary frameworks for operating quantum computers
- ➔ Neutral-atom platforms are very promising candidates for quantum information processing as they can be operated in both modes