

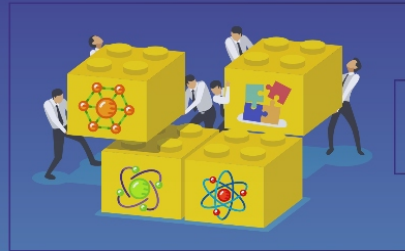
PHYSICS WITHOUT FRONTIERS

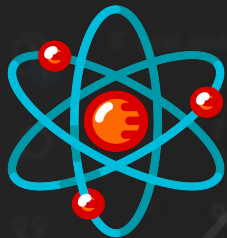
PHYSICS REBOOT

QUANTUM INFORMATION BOOTCAMP



APR 15 - APR 30 (2022)





Quantum Information
Science & Technology

Physics Research and Education Bootcamps Physics REBoot Venezuela

ICTP-PWF and COF Alumni USB



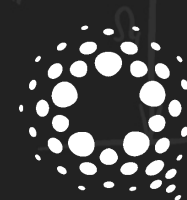
Quantum stacks

Quantum Computing – Lecture 5

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Centre Européen de Science Quantiques (CESQ)
Apr.2022

Université

de Strasbourg



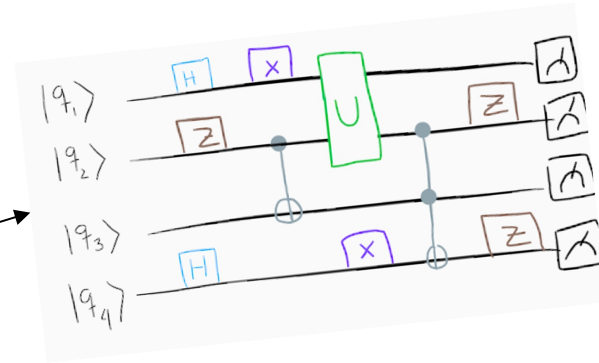
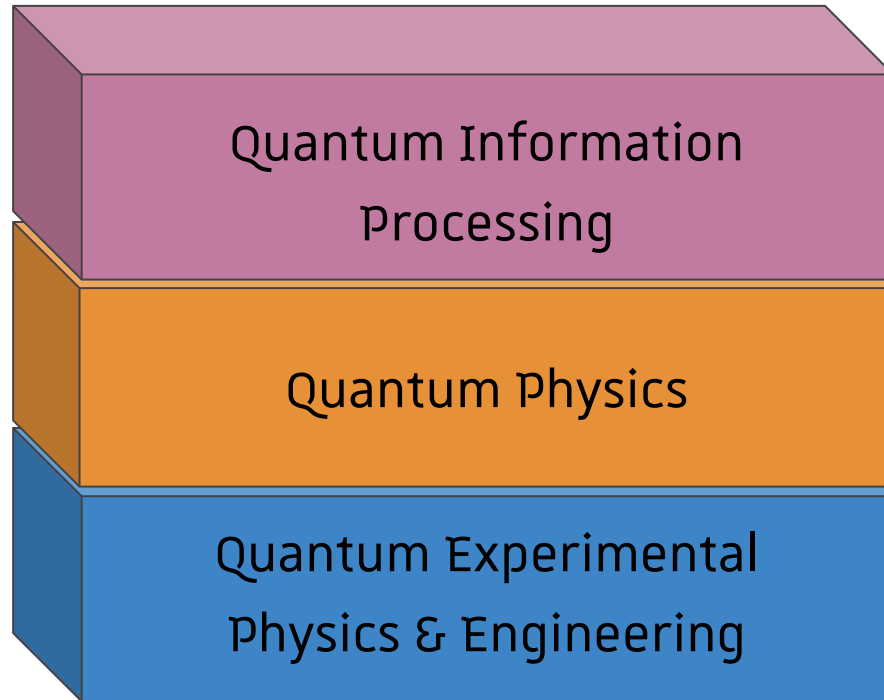
QUSTEC

Quantum Science and Technologies
at the European Campus

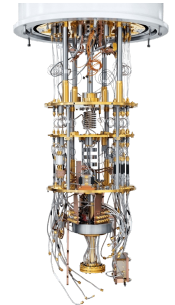


Quantum error correction

Algorithmic approach

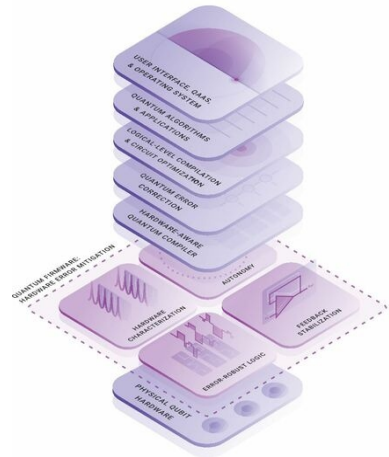


$$\hat{H}_{JC} = \hbar\omega_c \left(\hat{a}_c^\dagger \hat{a}_c + \frac{1}{2} \right) + \hbar\omega_{eg} |e\rangle\langle e| + \hbar g_c (\hat{\sigma}_+ \hat{a}_c + \hat{\sigma}_- \hat{a}_c^\dagger)$$

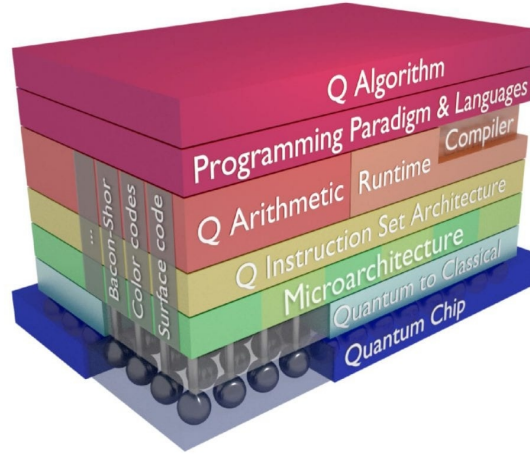


Quantum Stacks

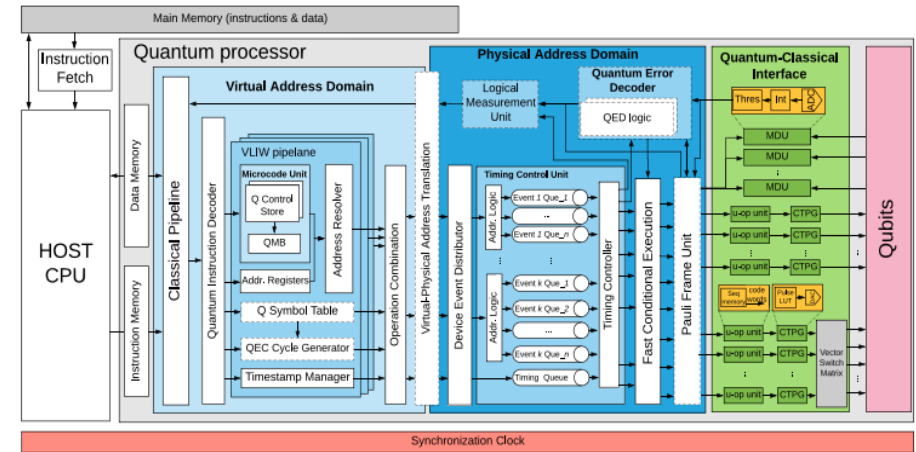
Zoo



Q-CTRL



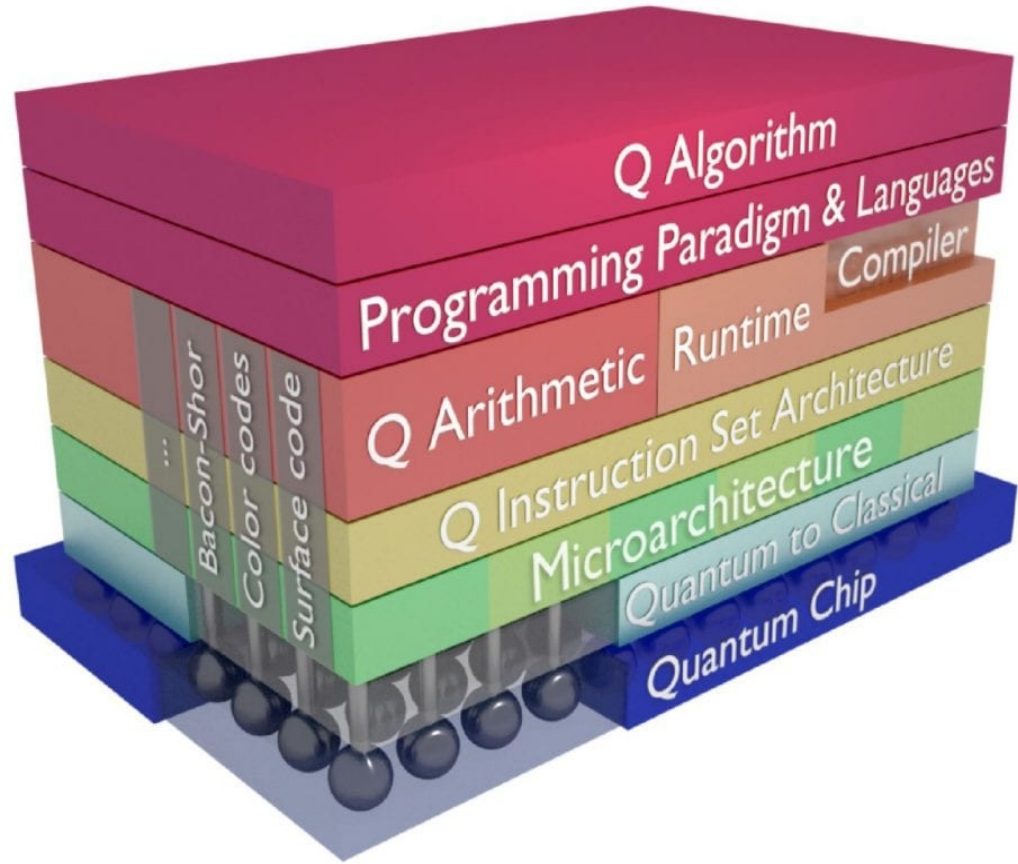
QuTech | TUDelft



Almudever's group

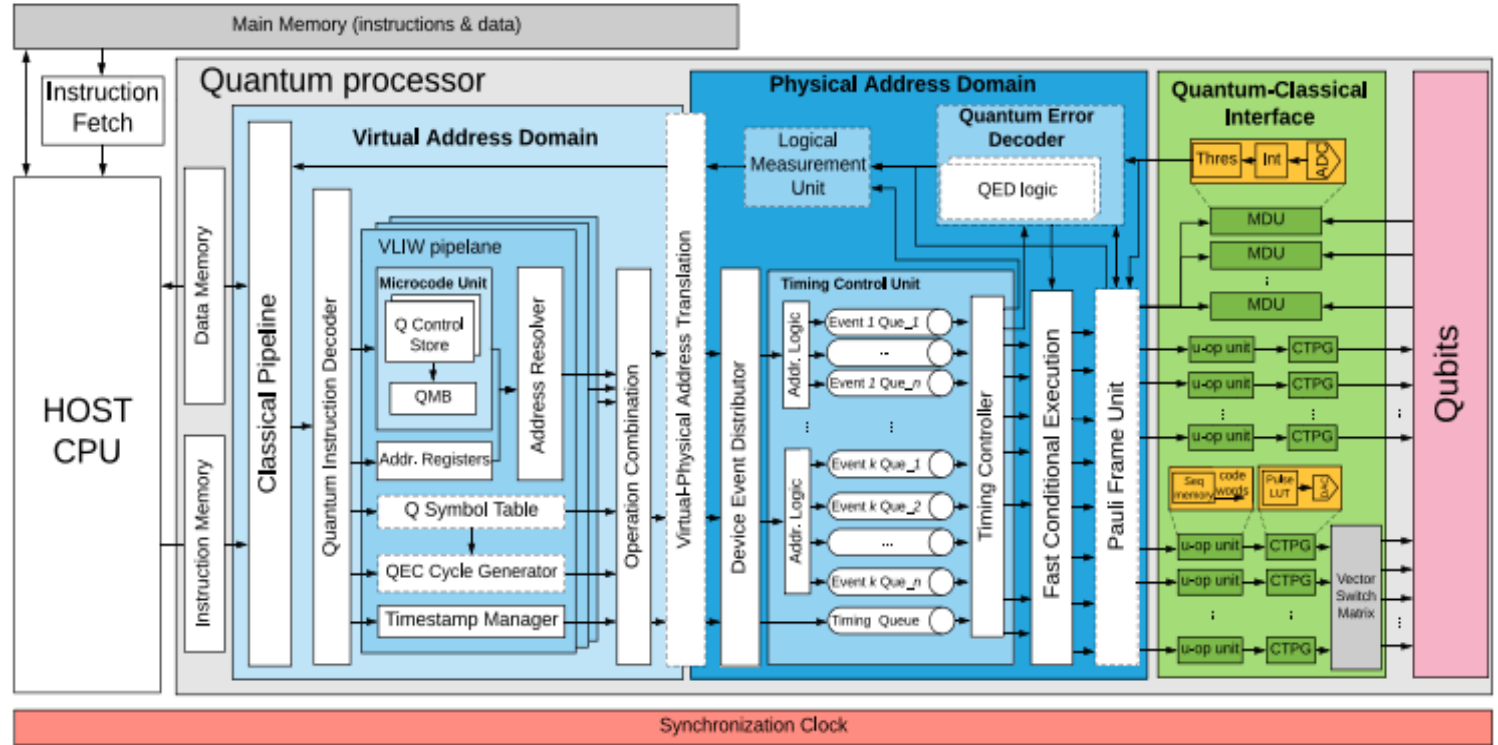
Quantum Stacks

Zoo



Quantum Stacks

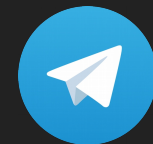
Zoo



Almudever's group

THANK YOU FOR YOUR ATTENTION ;)

$|Questions\rangle + |answers\rangle$



Gather



test.qasm test.py

```
from qiskit import ClassicalRegister, QuantumCircuit, execute, BasicAer
from qiskit import QuantumRegister, QuantumCircuit, execute, BasicAer

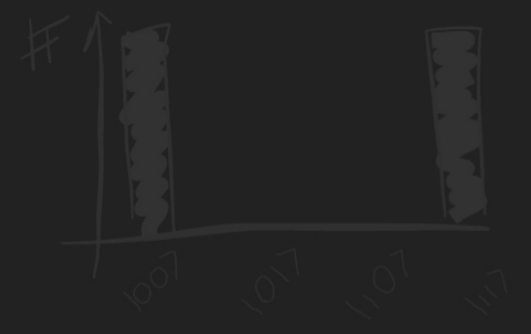
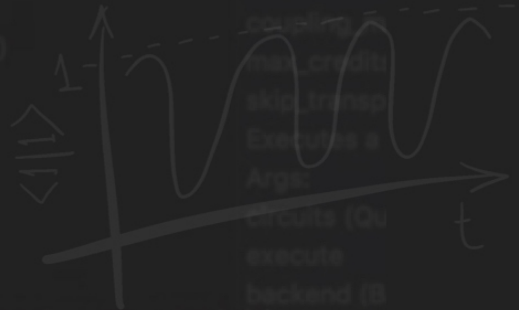
q = QuantumRegister(2)
c = ClassicalRegister(2)
qc = QuantumCircuit(q, c)

qc.h(q[0])
qc.cnot(q[0], q[1])

qc.measure(q, c)

13 job_sim = execute(qc, "local_qasm_simulator")
```

$$\Delta E = -R_H \left(\frac{1}{n_i^2} - \frac{1}{n_f^2} \right)$$



$$2\hat{P} = -\frac{i}{\hbar} [\hat{H}, \hat{P}] + \mathcal{L}(\hat{P})$$

Backup slides

