

Call 2019

# QuCoS

Quantum Computation with  
Schrödinger cat states

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ÉCOLE  
NORMALE  
SUPÉRIEURE  
DE LYON



*Inria*  
INVENTEURS DU MONDE NUMÉRIQUE



QM  
QUANTUM MACHINES



universität  
innsbruck



<https://qucos.eu/>



# PROJECT PROGRESS (highlights)



## CHALLENGE

overhead in quantum error corrections with e.g. surface code  $\approx 100$  physical qubits  $\Rightarrow$  logical qubit



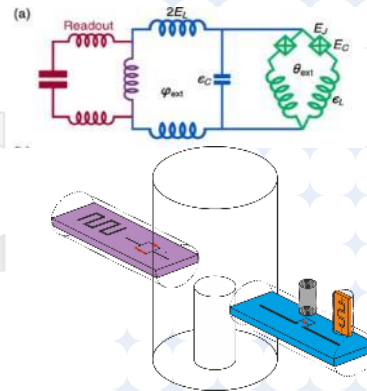
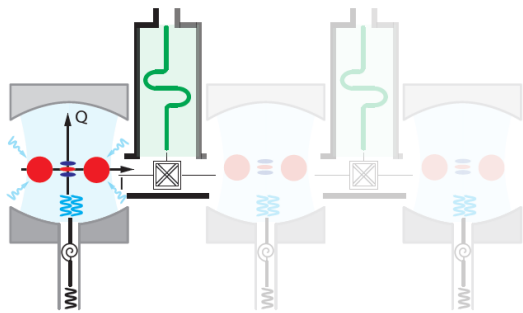
## SOLUTION

hardware efficient encoding with Bosonic codes

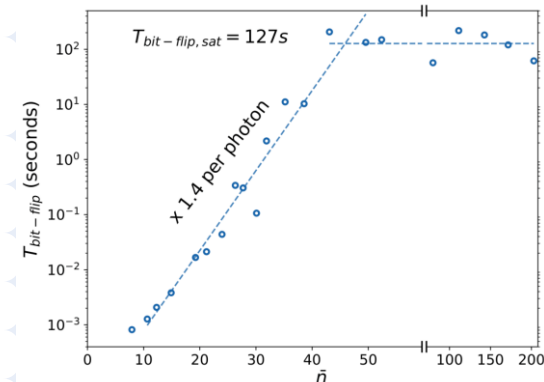


## IMPLEMENTATION

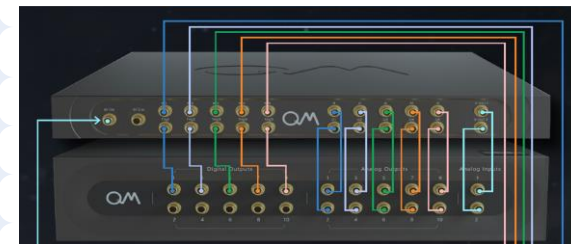
Building components



Biased qubit realization



Hardware Development



Quantum machines Octave



## HURDLES –

Semiconductor deliver times – hardware development  
Limited access to laboratory and cleanroom facilities  
Hiring people due to strong start-up scene

# IMPACT (RRI aspects)



GENDER balance: 20 % female



OPEN SCIENCE:

zenodo

arXiv



SCIENCE EDUCATION:

Summer School speakers

Summer internships for school pupils and students



PUBLIC ENGAGEMENT:

Qiskit Seminar presentations



Pint of science Talk



Long night of research & Day of Physics & Science Fair

Participation in world quantum day



# QUANTERA

ERA-NET Cofund in Quantum Technologies



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 731473.