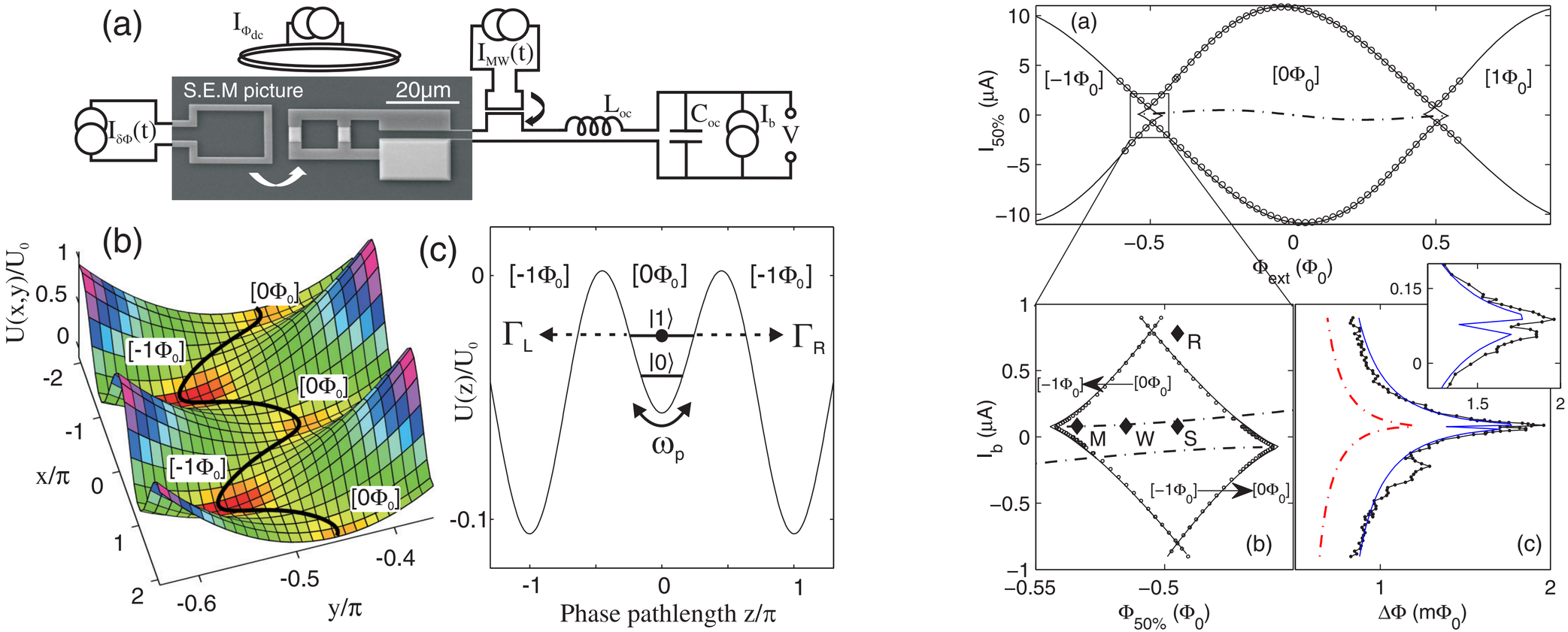
PhD defense, November 24th 2009, Grenoble

Quantum Dynamics in a Camelback Potential of a dc SQUID

E. Hoskinson,[1] F. Lecocq,[1] N. Didier,[2] A. Fay,[1] F. W. J. Hekking,[2] W. Guichard,[1] and O. Buisson[1]
[1]*Institut Néel, C.N.R.S.–Université Joseph Fourier, BP 166, 38042 Grenoble-cedex 9, France*
[2]*LPMMC, C.N.R.S.–Université Joseph Fourier, BP 166, 38042 Grenoble-cedex 9, France*

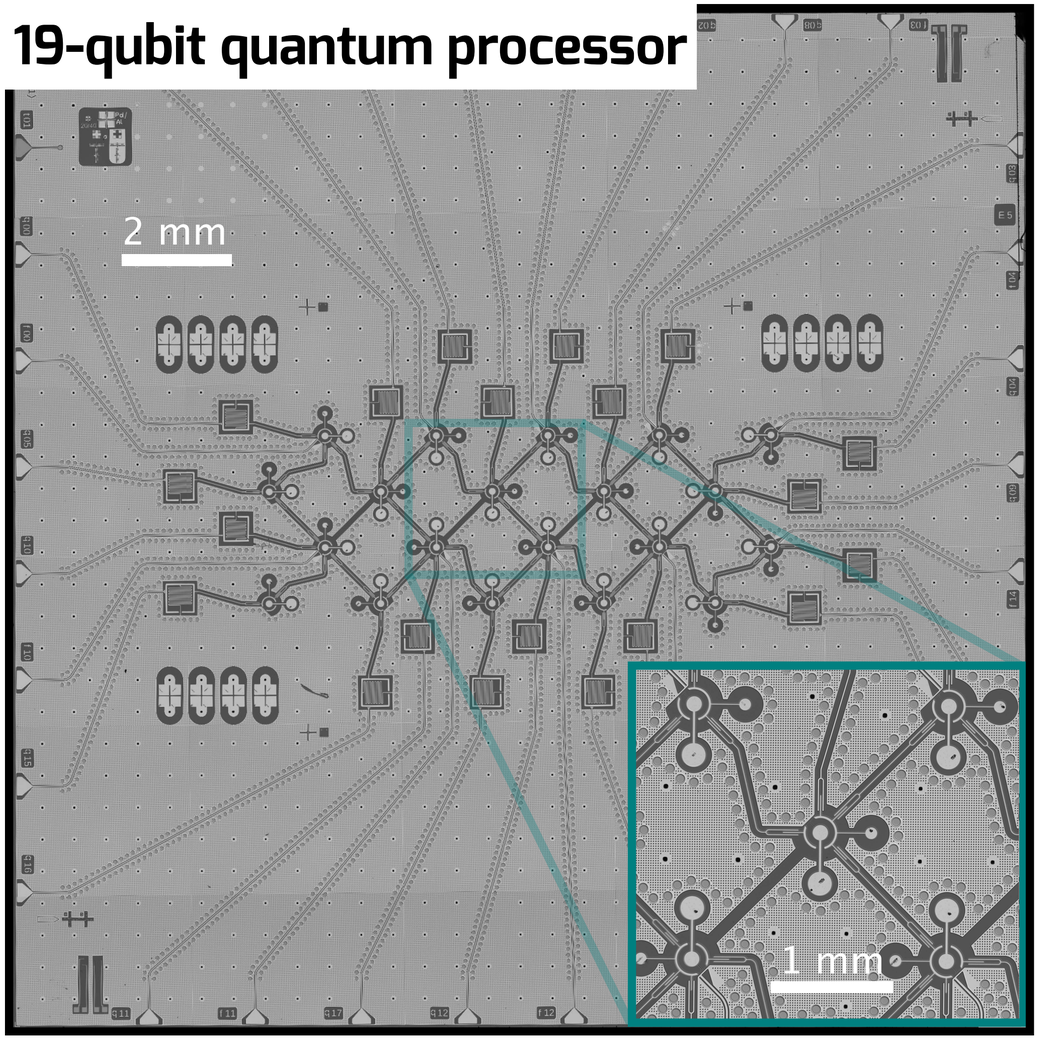
R. Dolata, B. Mackrodt, and A. B. Zorin
Physikalisch-Technische Bundesanstalt, Bundesallee 100, 38116 Braunschweig, Germany



Macroscopic quantum tunneling in quartic and sextic potentials: Application to a phase qubit
ND and Frank Hekking, Phys. Rev. B 85, 104522 (2012)

Rigetti Computing:
Full stack quantum computing

19-qubit quantum processor



Fremont, CA

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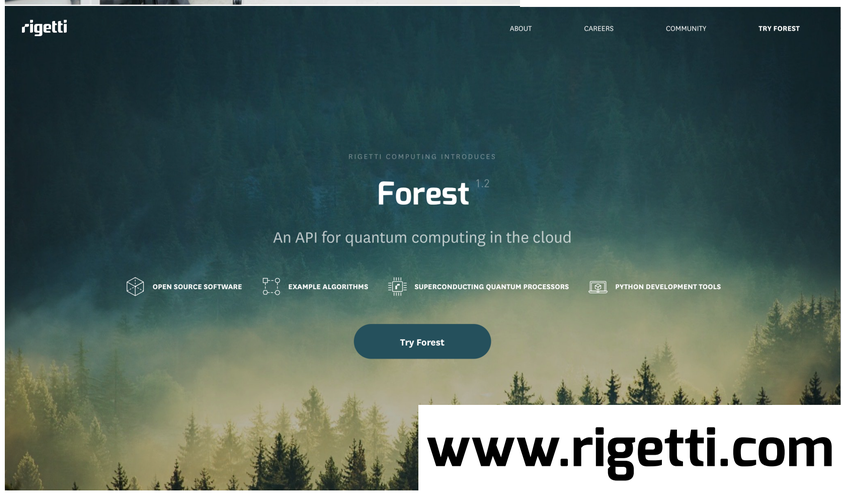
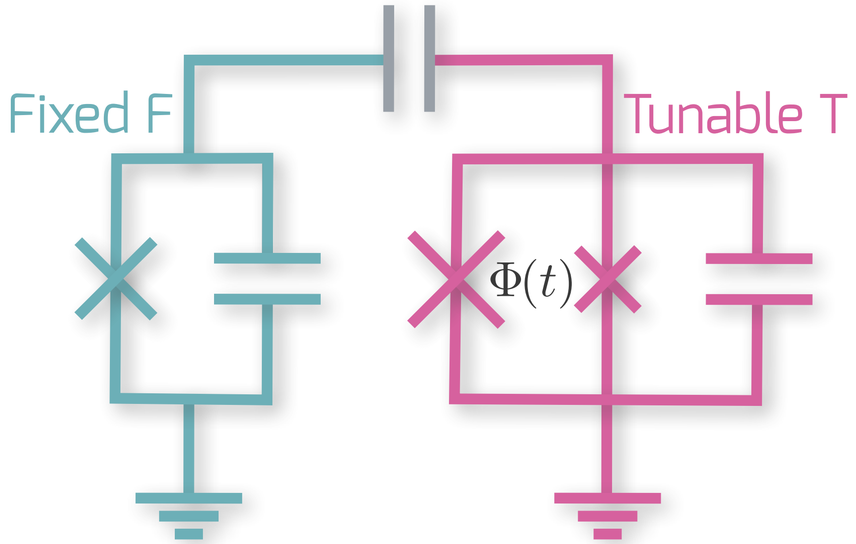
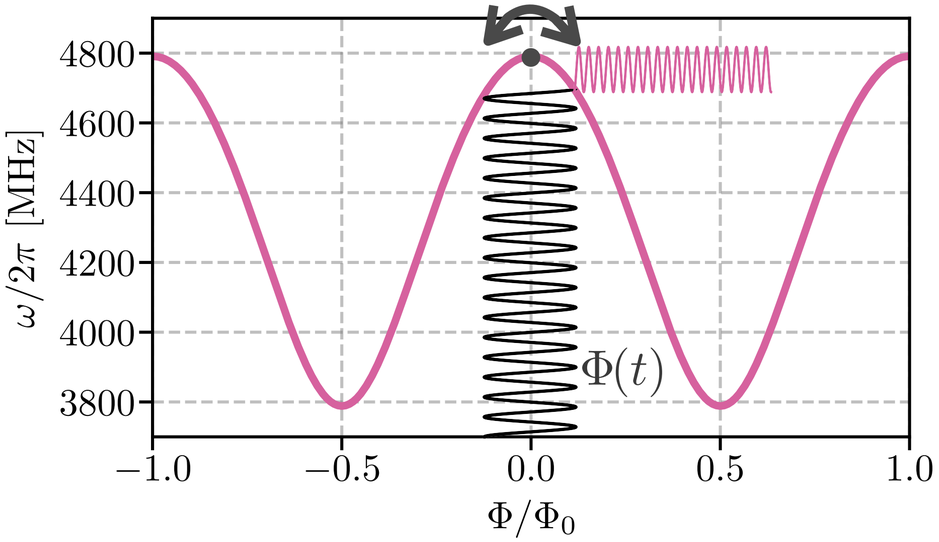


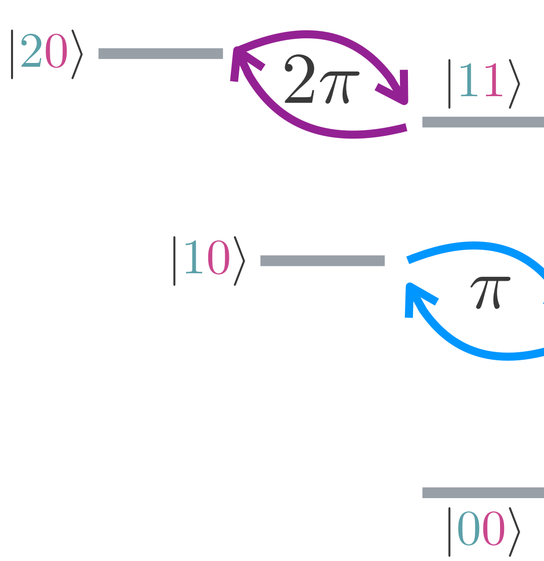
www.rigetti.com

Parametrically-activated entangling gates





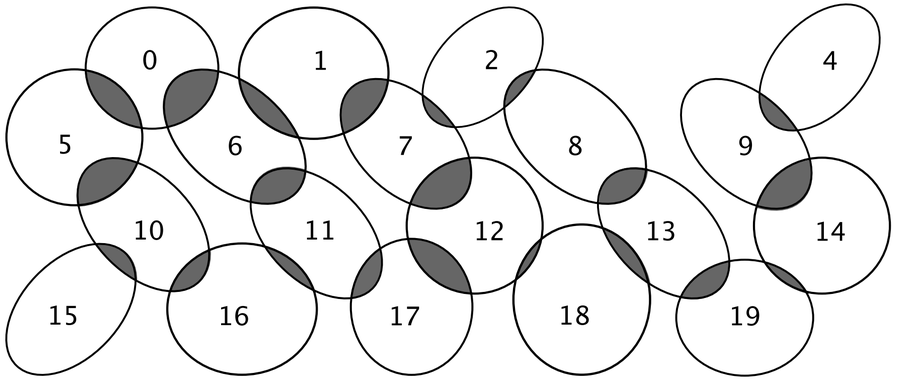
Analytical model: arXiv:1706.06566
2-qubit demo: arXiv:1706.06562
8-qubit proc: arXiv:1706.06570
19-qubit proc: arXiv:1712.05771

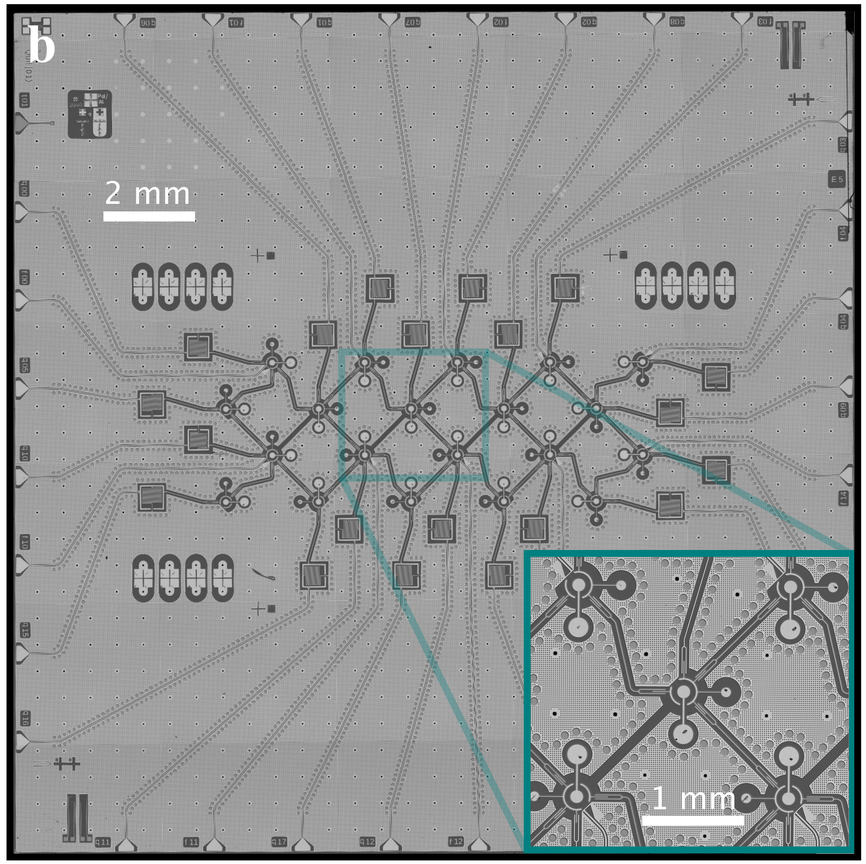


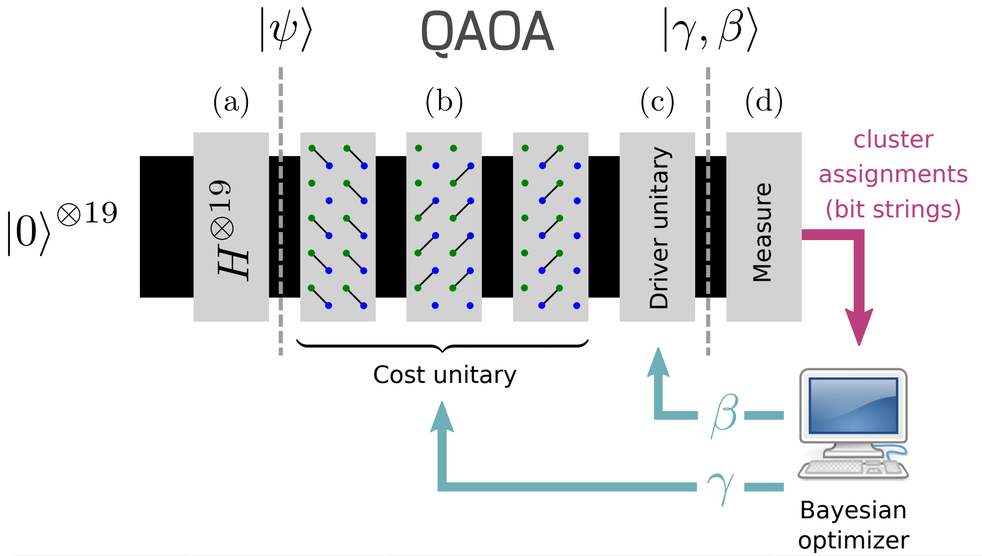
$$\hat{U}_{\mathrm{CZ}} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$$

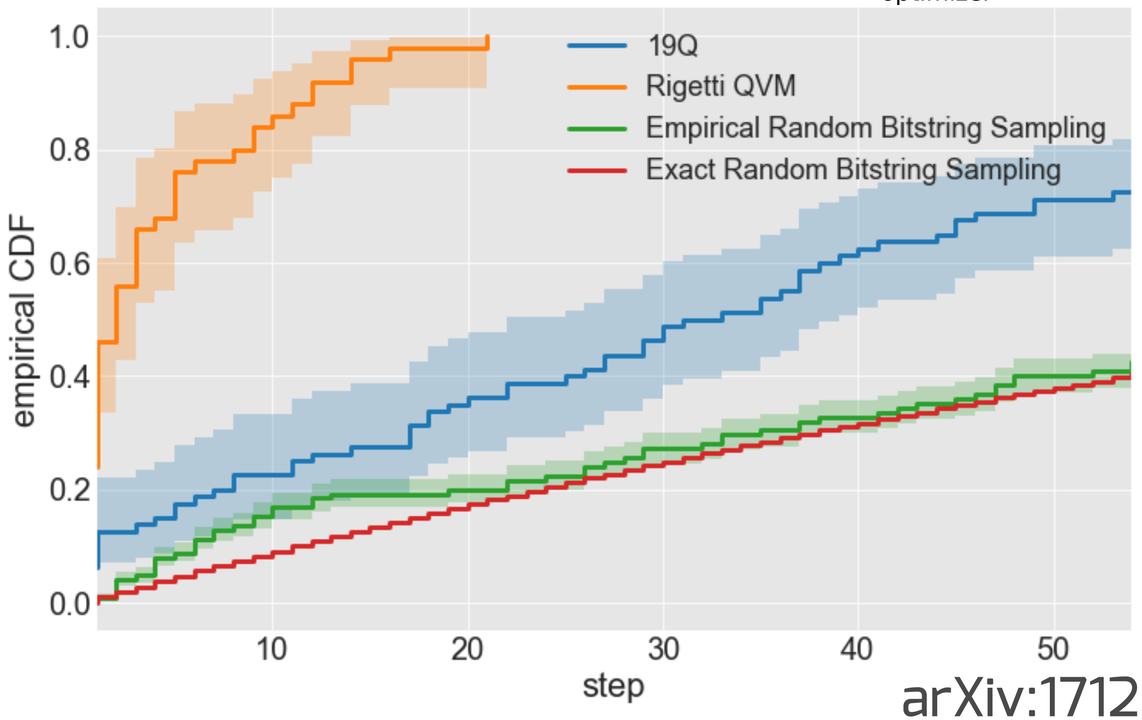
$$\hat{U}_{\mathrm{iSWAP}} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & i & 0 \\ 0 & i & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

Hybrid quantum-classical algorithm: clustering









arXiv:1712.05771