

**Abstract.** Quantum error correction with biased-noise qubits can drastically reduce the hardware overhead for universal and fault-tolerant quantum computation. In particular, cat qubits feature an exponential error bias thanks to their non-local encoding in the phase space of a quantum harmonic oscillator, and are thus a promising kind of biased-noise qubits. To confine the state of a quantum oscillator to the cat qubit manifold, two main approaches exist: a Kerr-based conservative confinement with high gate performances, and a dissipative confinement with robust protection from the thermal and dephasing noise that occur in resonators. In this talk, we will present the cat qubit encoding and introduce a combined dissipative and Hamiltonian confinement to benefit from the best of both worlds. (*arXiv:2112.05545, to appear in PRX Quantum*)