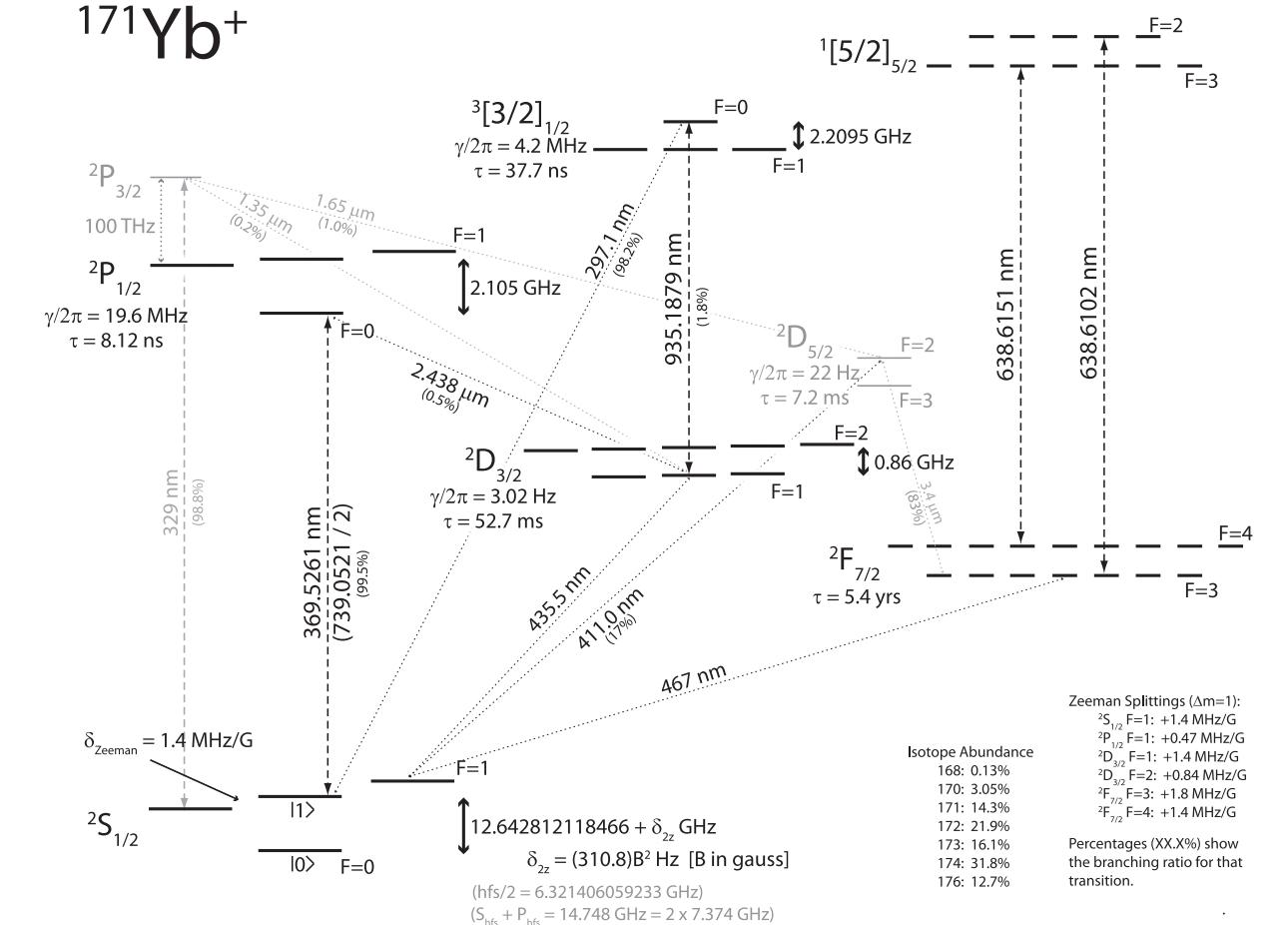


A next-generation trapped ion quantum computing system - a.k.a. "brassboard"

Yichao Yu ¹, Liudmila Zhukas ¹, Lei Feng ^{1,2}, Marko Cetina ^{1,2}, Crystal Noel ^{1,2},
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Trapped Ion Quantum Computing

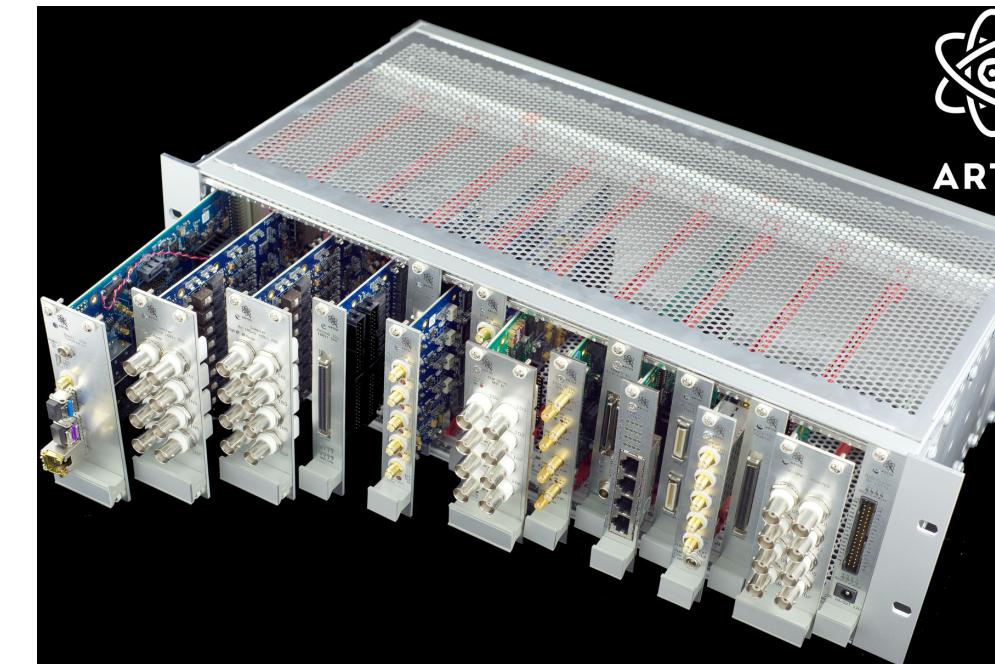


Vacuum System

Phoenix Surface Trap

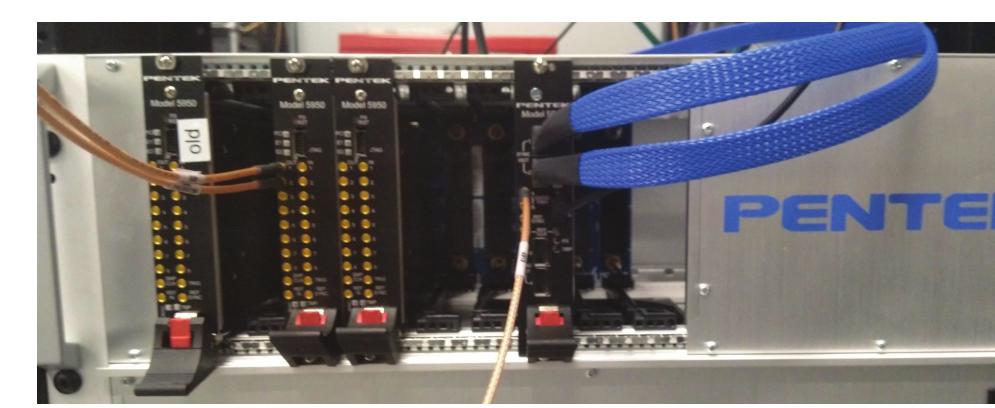
ARTIQ

- Artiq software
- Sinara hardware



RFSoC/Pentek

- integrated pulse-level control
- phase synchronization



Raman System

Miniaturized Beam Path

Control System

Duke Artiq Extensions

- modular control software
- system code organization

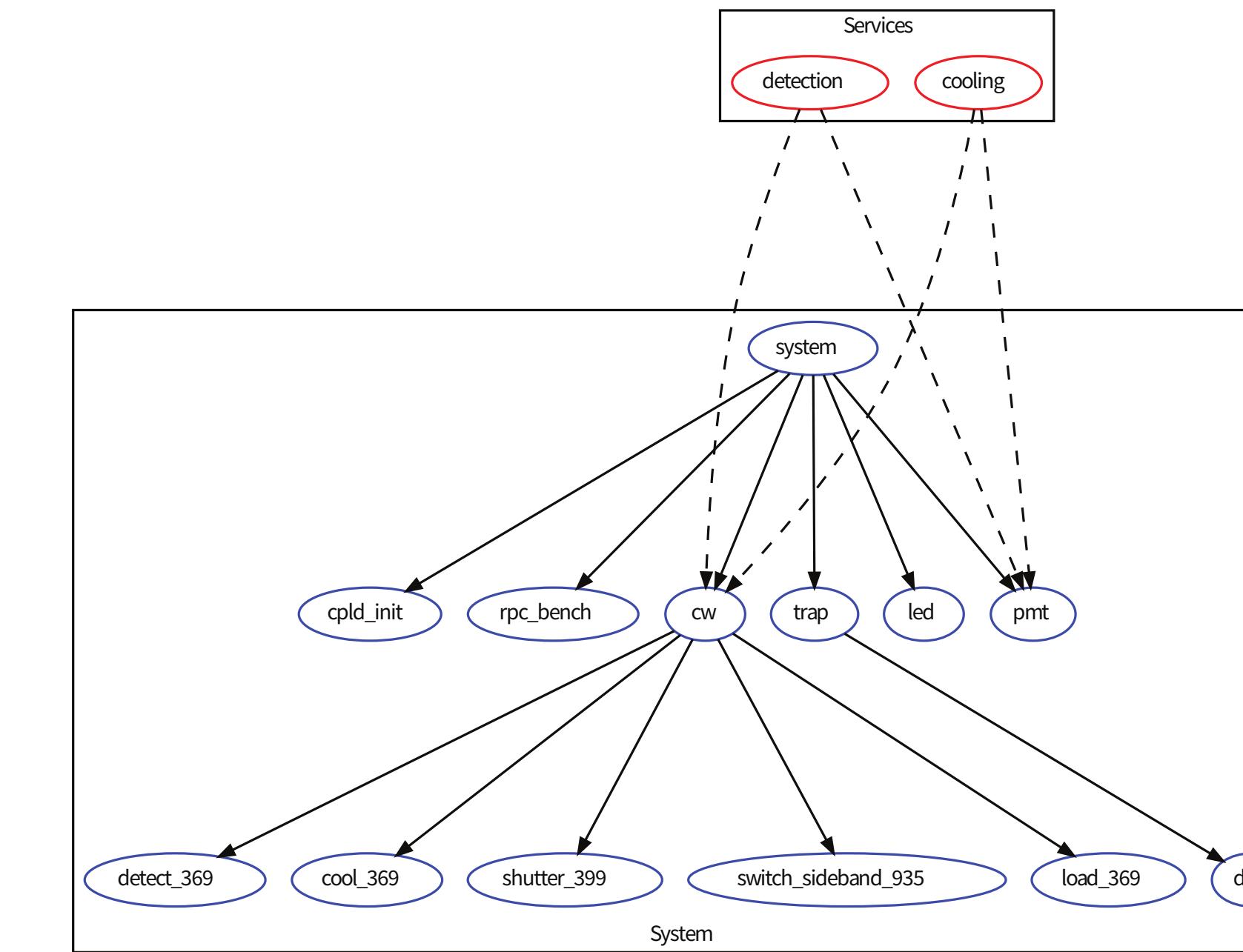


Figure by Leon Riesenbos

Imaging System

Applications

- Universal Quantum Computer
- 20+ qubits and high fidelity
- Quantum simulations of many body physics
- Quantum chemistry
- Quantum gravity
- Nuclear theory
- Quantum Error Correction

