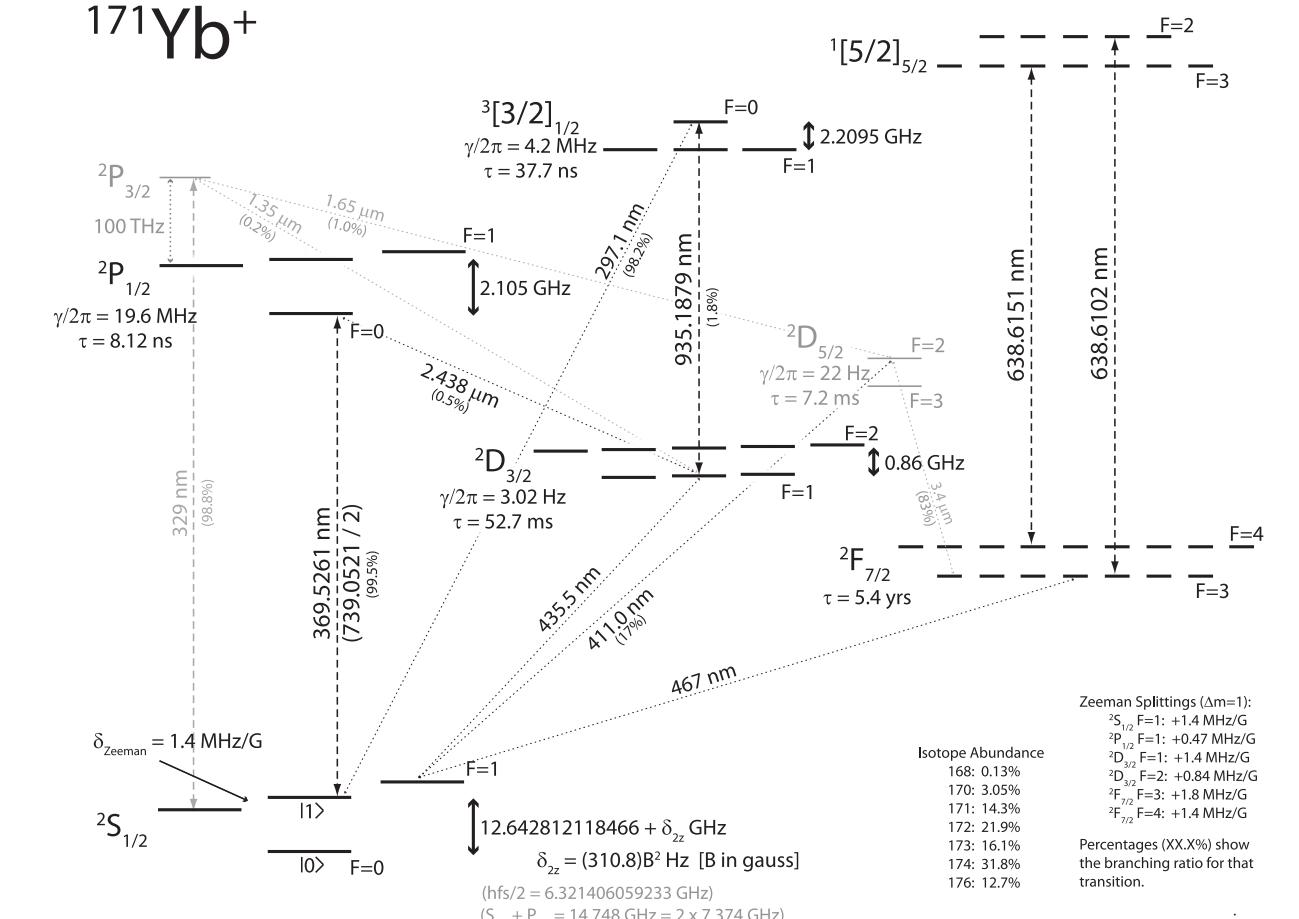


# A next-generation trapped ion quantum computing system - a.k.a. "brassboard"

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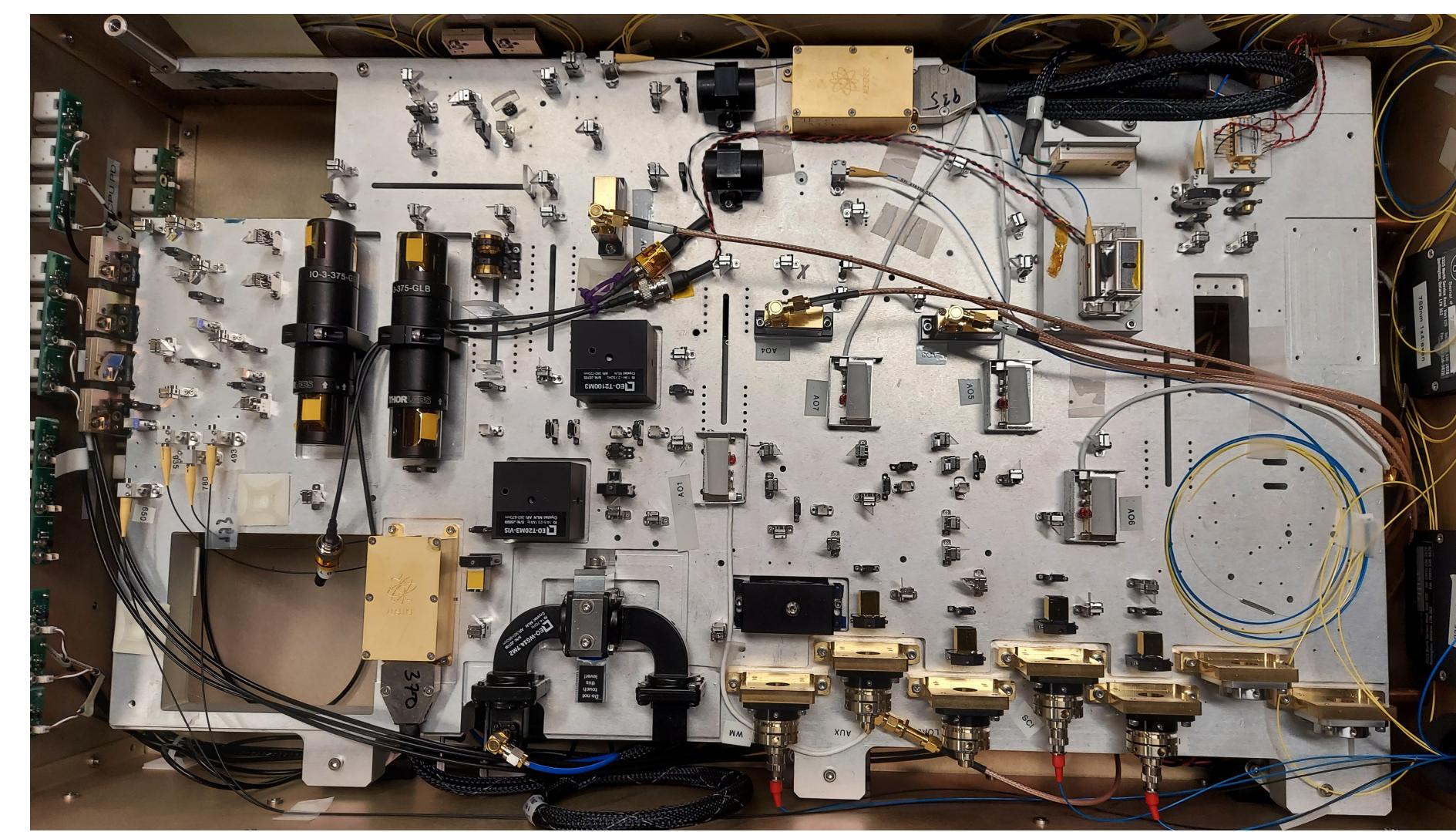
## Trapped Ion Quantum Computing



## Vacuum System

## Raman System

### Miniaturized 369/399/780/935nm Beam Path



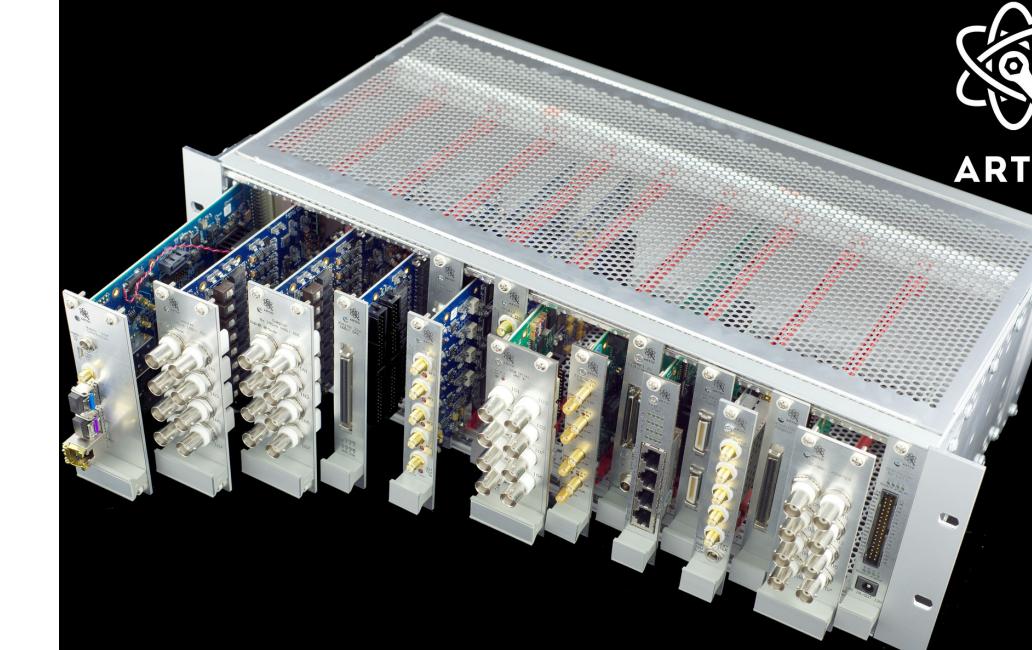
## Imaging System

## Phoenix Surface Trap

## Control System

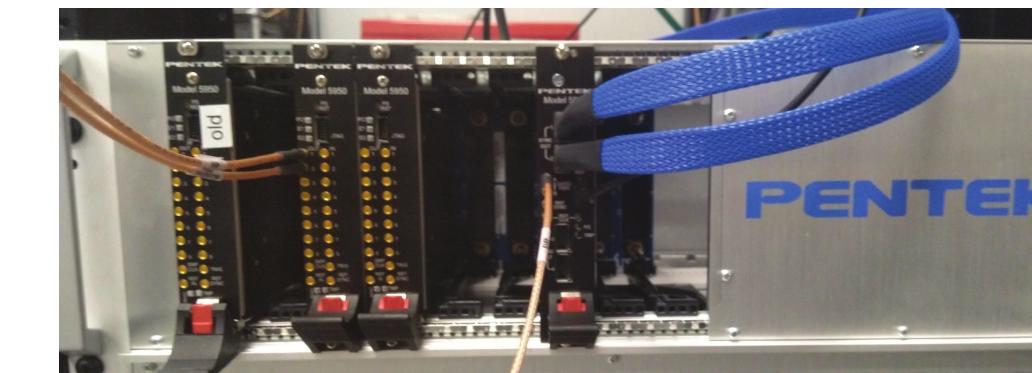
### ARTIQ

- Artiq software
- Sinara hardware



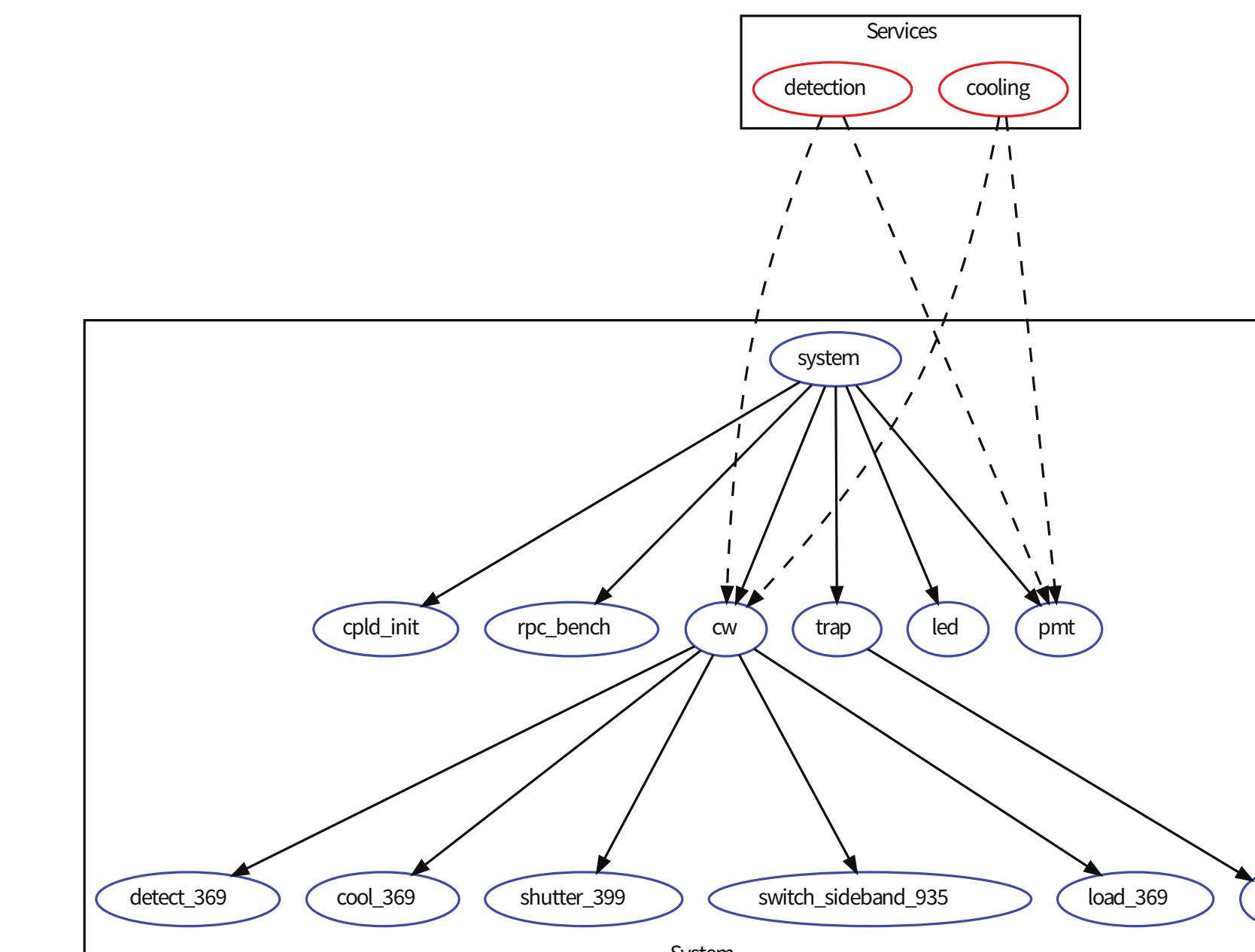
### RFSoC/Pentek

- integrated pulse-level control
- phase synchronization



### Duke Artiq Extensions

- modular control software
- system code organization



## Applications

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

