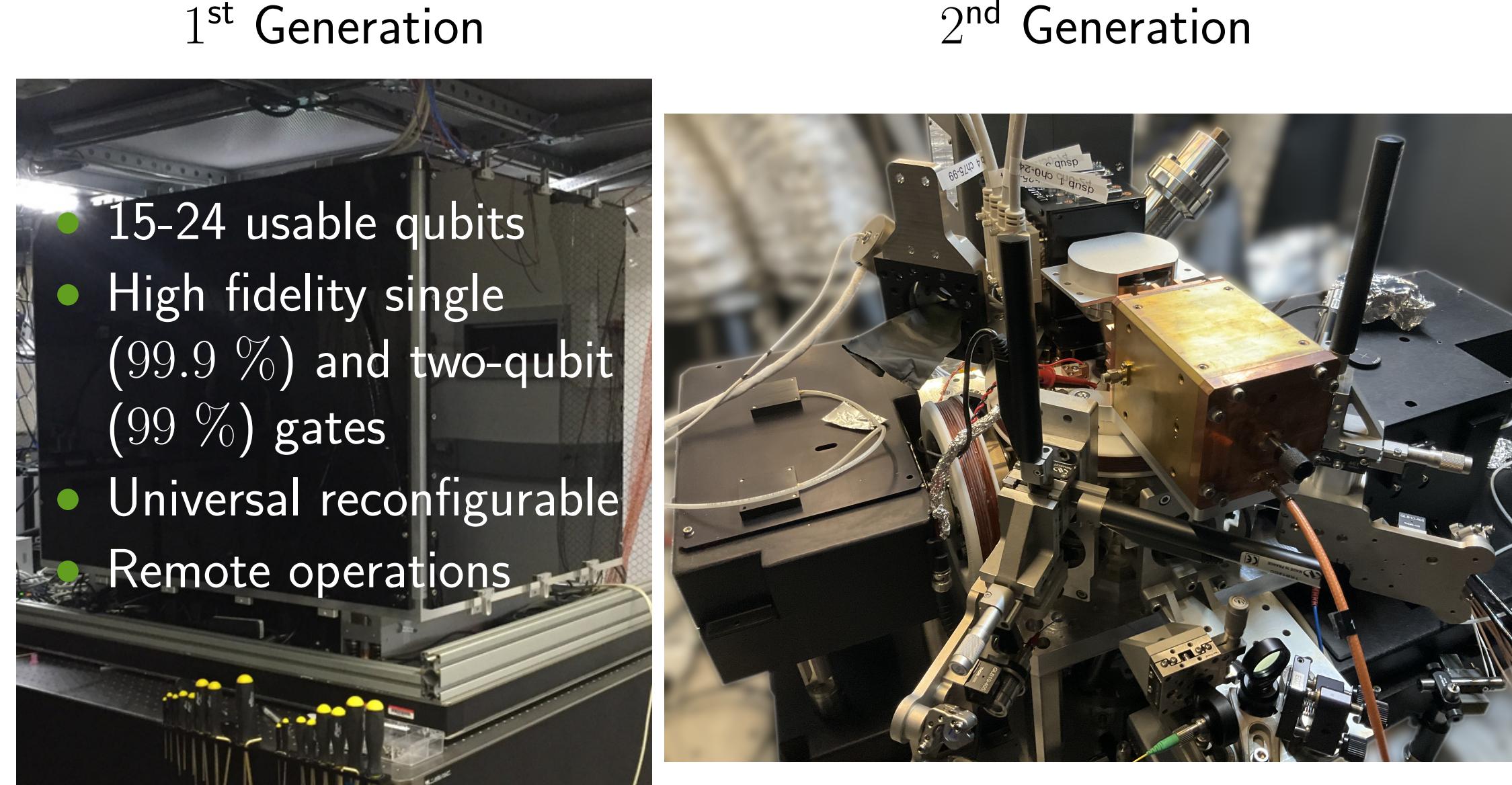


# A next-generation trapped ion quantum computing system - a.k.a. "brassboard"

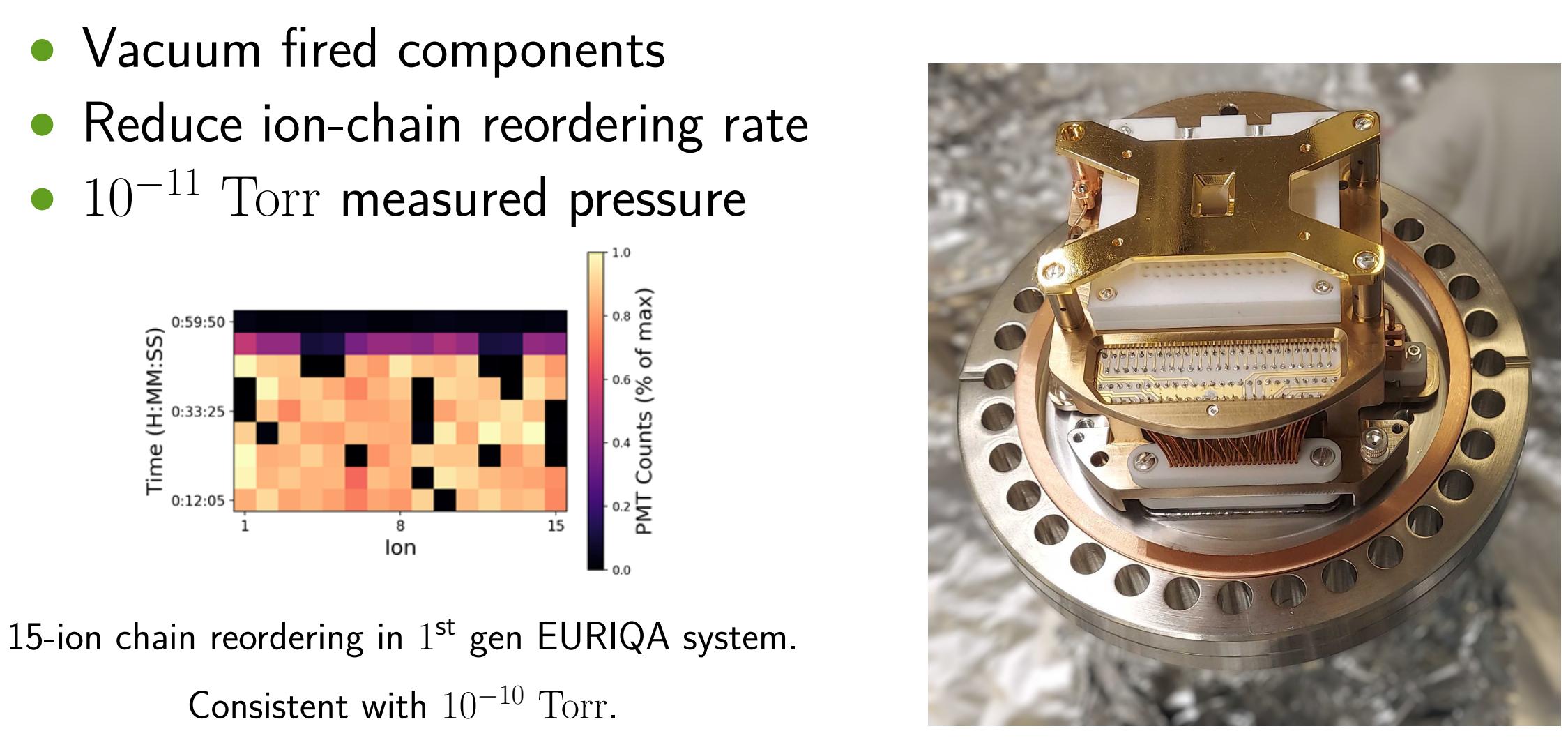
Yichao Yu <sup>1</sup>, Liudmila Zhukas <sup>1</sup>, Lei Feng <sup>1,2</sup>, Marko Cetina <sup>1,2</sup>, Crystal Noel <sup>1,2</sup>,  
Debopriyo Biswas <sup>1,2</sup>, Andrew Risinger <sup>2</sup>, Alexander Kozhanov <sup>1</sup>, Christopher R Monroe <sup>1,2,3</sup>

<sup>1</sup>Duke Quantum Center, Duke University <sup>2</sup>Joint Quantum Institute, University of Maryland <sup>3</sup>IonQ, Inc.

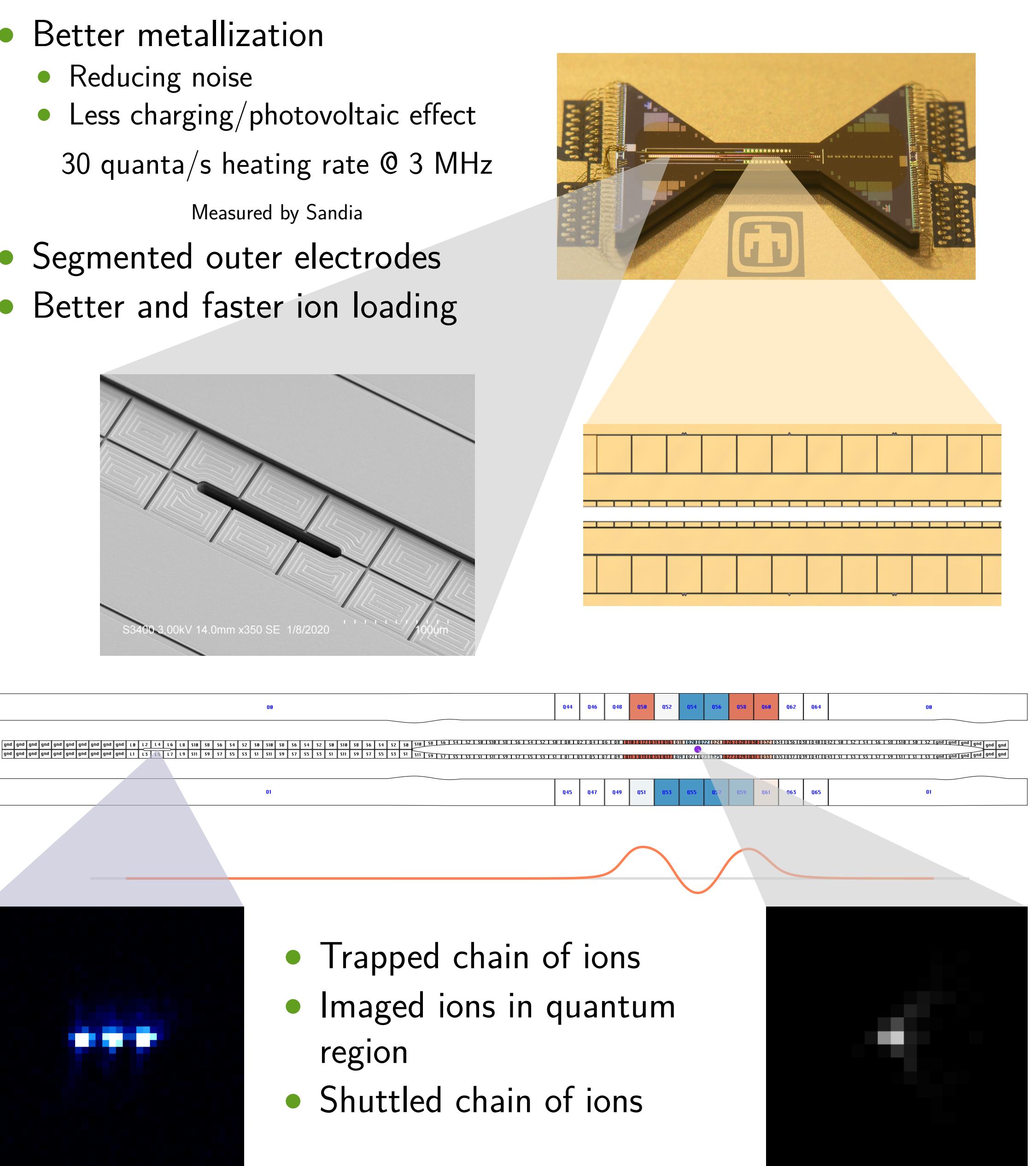
## Error-corrected Universal Reconfigurable Ion-trap Quantum Archetype



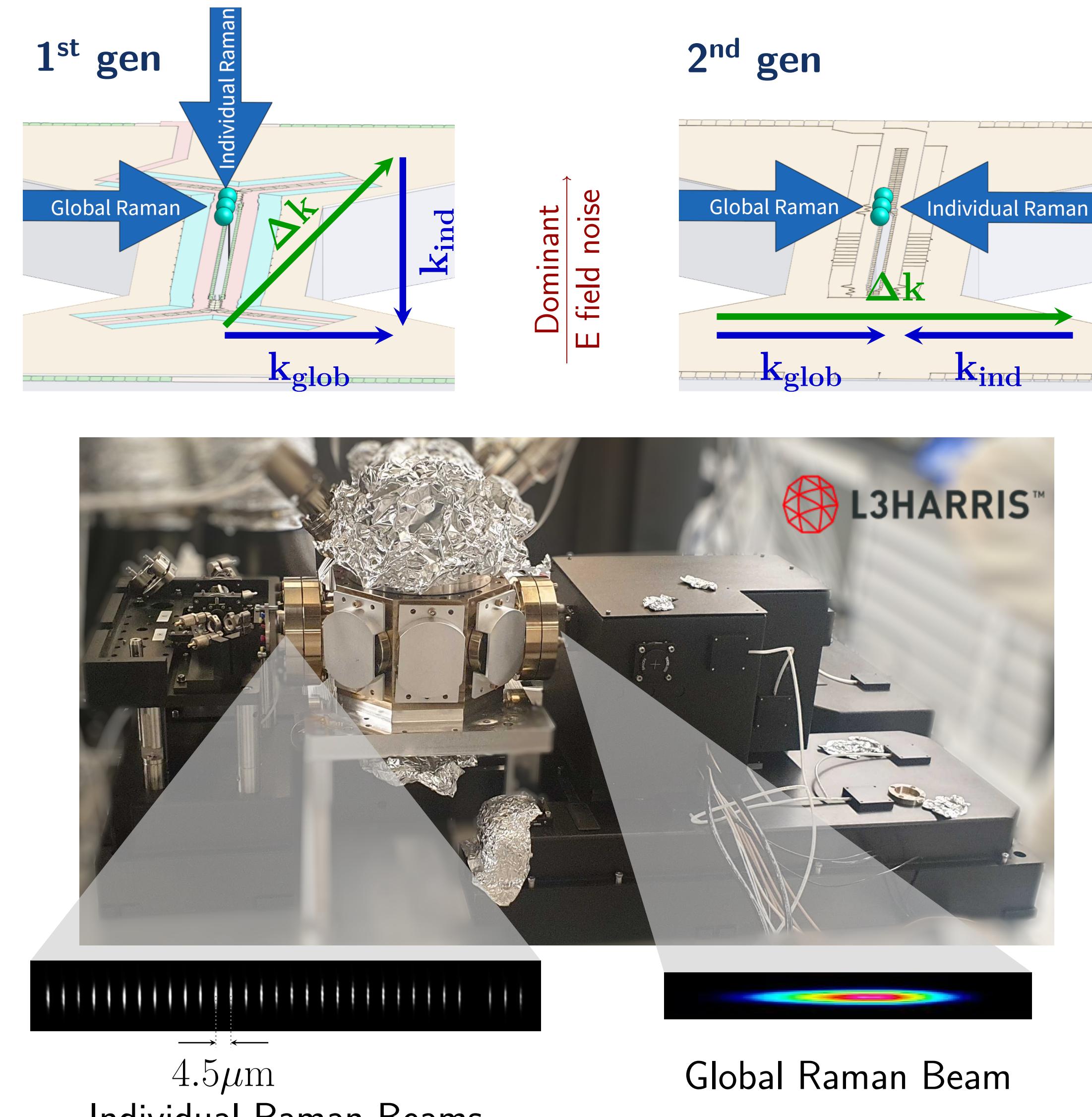
## Vacuum System



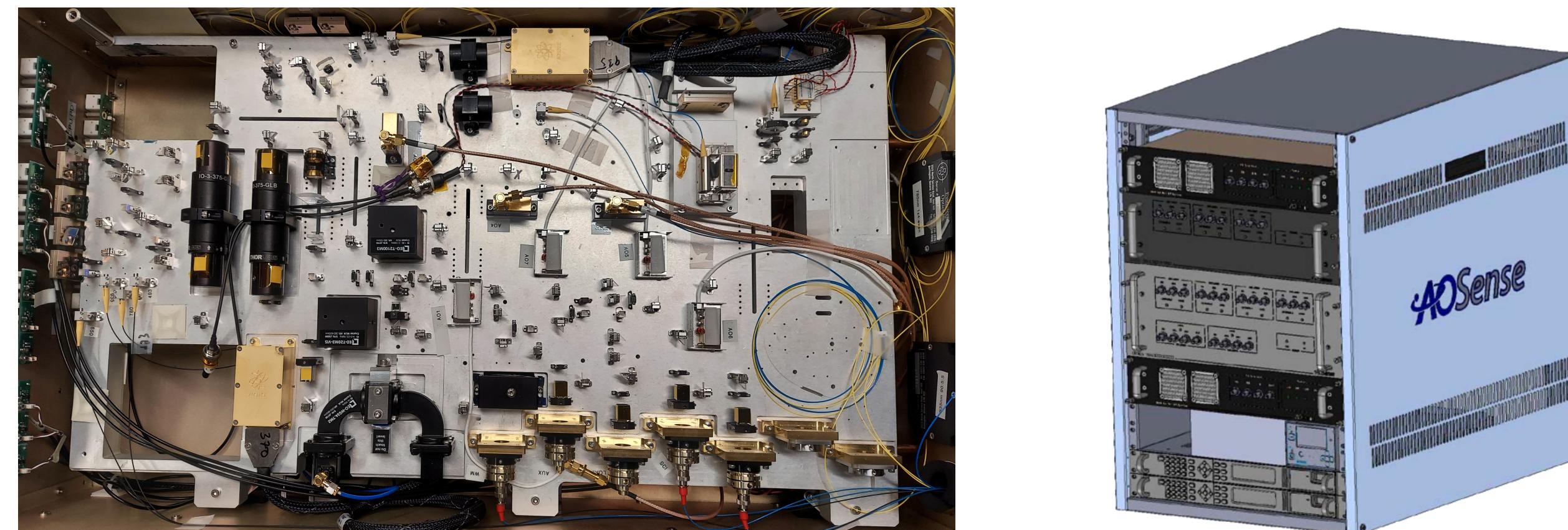
## Phoenix Surface Trap



## Raman System

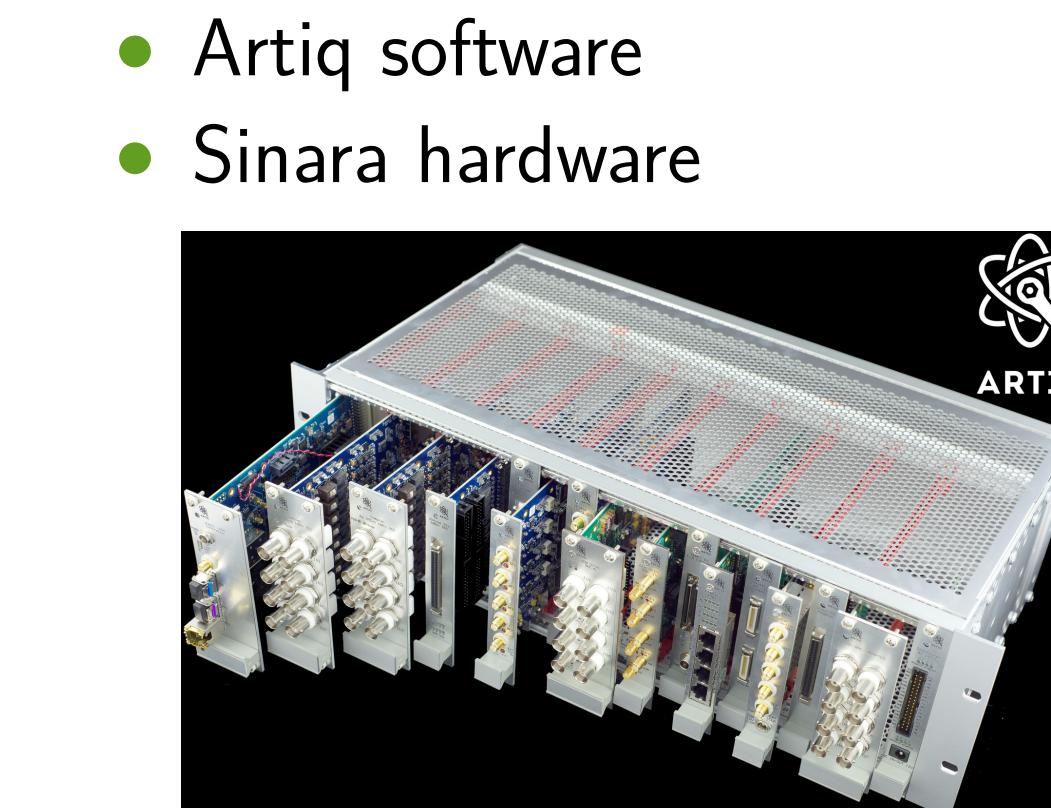


## Miniaturized 369/399/780/935nm Beam Path

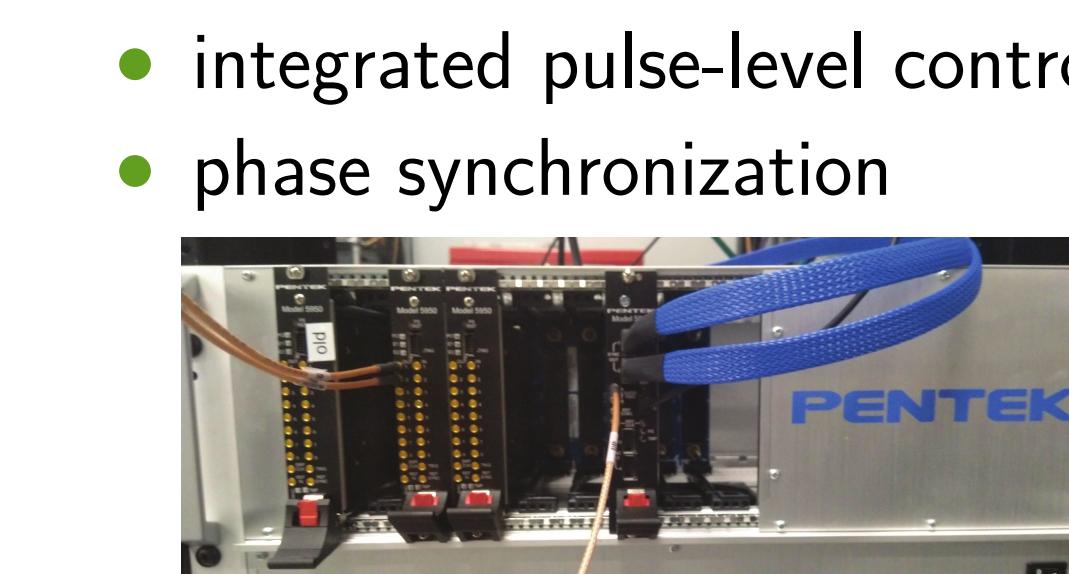


## Control System

### ARTIQ

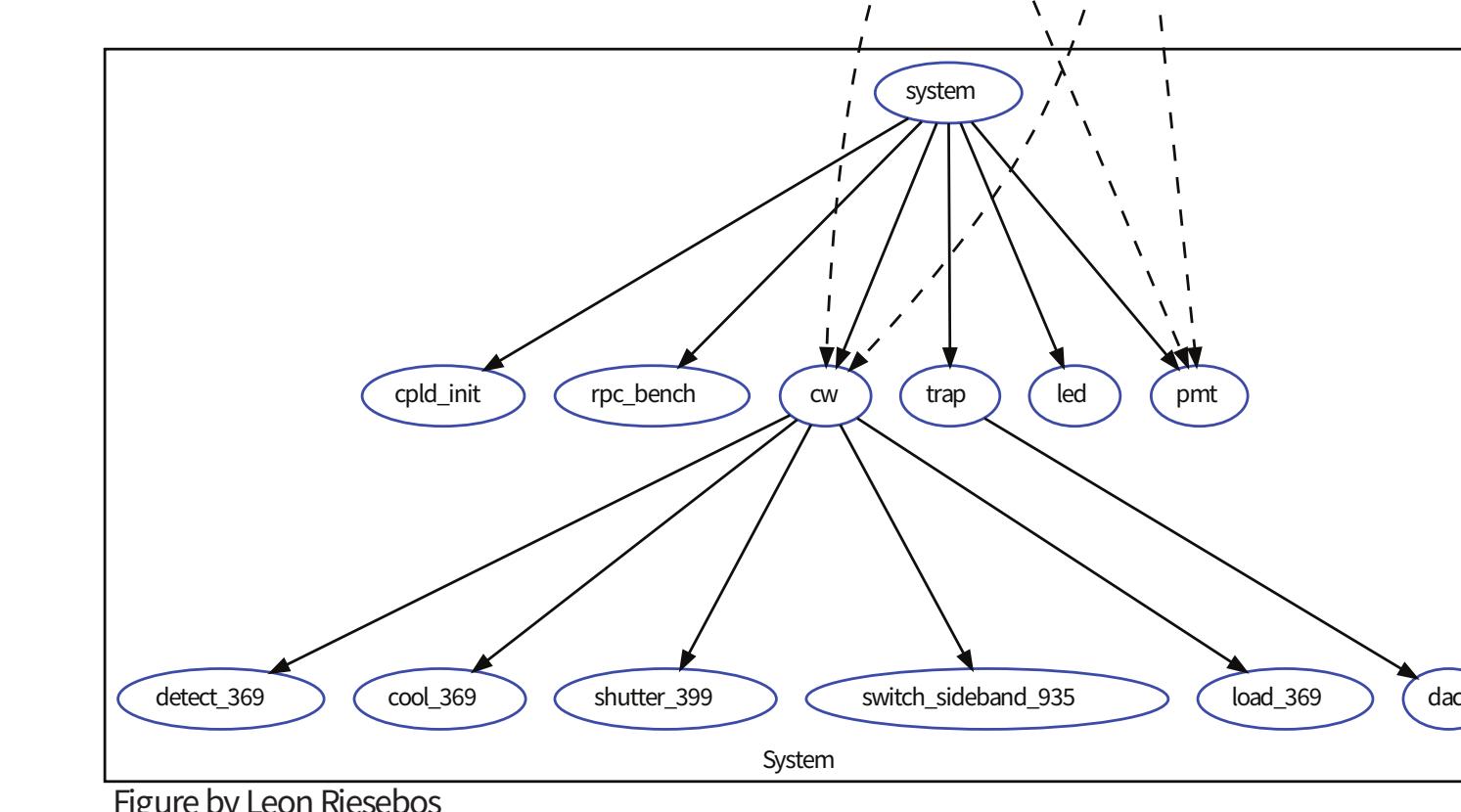


### RFSoC/Pentek



### Duke Artiq Extensions

- modular control software
- system code organization



## Imaging System

