



# FT-AQuA

## Fault tolerant atomic qubit array



- Preliminary team: University of Wisconsin-Madison, University of Colorado, University of New Mexico, University of Arizona, Aarhus University, ColdQuanta, SRI, Sandia
- PI - Mark Saffman, UW-Madison
- Preliminary team member list: MS, Robert Joynt, Ivan Deutsch, Poul Jessen, Dana Anderson, Sterling McBride, Klaus Mølmer, Grant Biedermann





## FT-AQuA

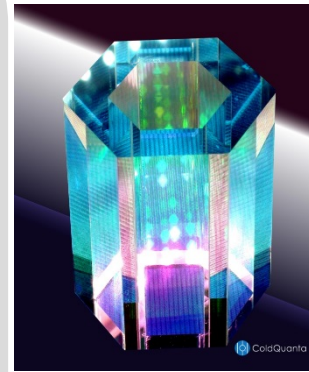
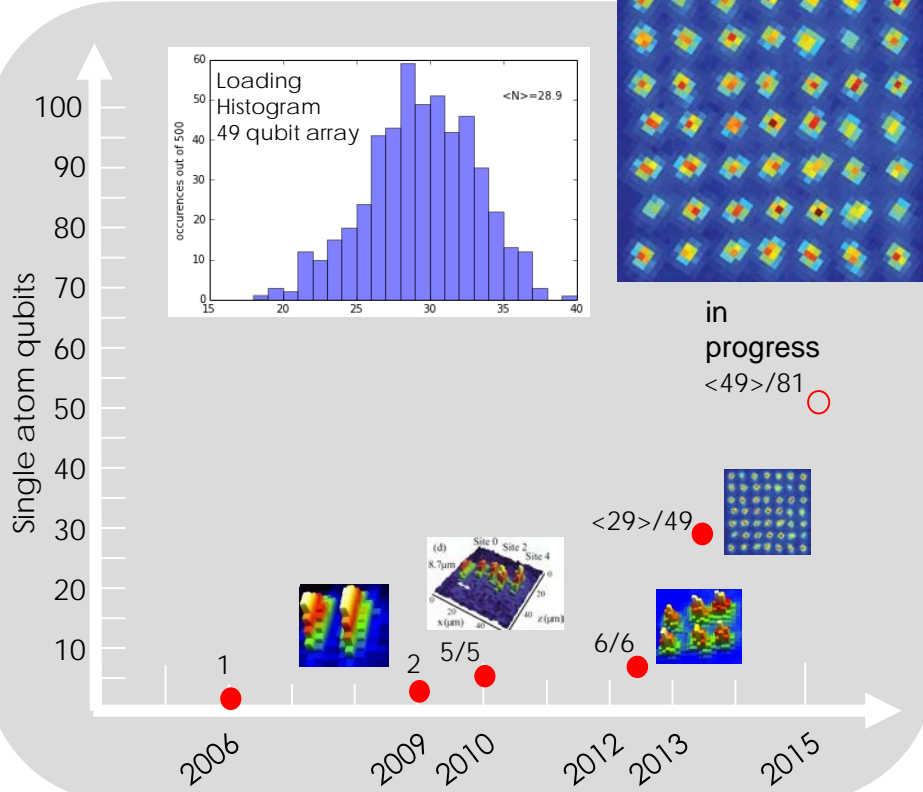
### Fault tolerant atomic qubit array

- Our goal is to demonstrate logical qubit operation based on arrays of neutral atom qubits.
- The project will leverage existing capabilities developed under IARPA-MQCO.    
I A R P A
- We will also develop new capabilities in the areas of: scalable hw/sw for event driven error correction, stable lasers, optical subassemblies, compact UHV cells, protocols for high fidelity single, two and multi-qubit gates, error correction codes optimized for neutral atom qubits

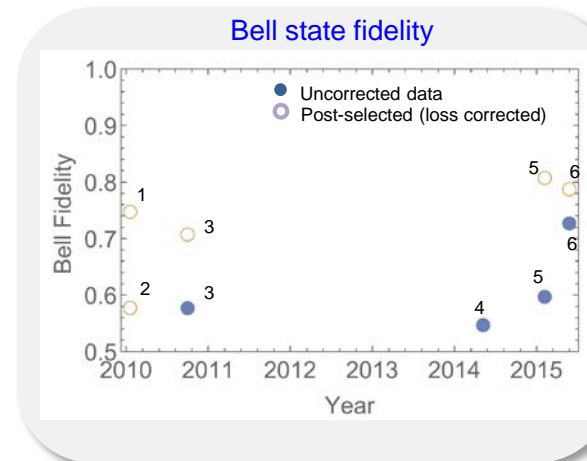
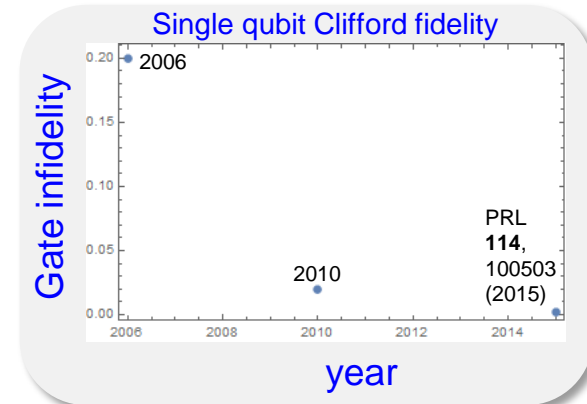


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## Qubit array scaling



ColdQuanta  
SRI International  
SARNOFF



1 PRL 96, 063001 (2006); 2 Nat. Phys. 5, 110 (2009); 5 APL 97, 134101 (2010); 6 unpublished (2012); 29 PRA 88, 013420 (2013), PRL 114, 100503 (2015)

1 Grangier/Browaeys, PRL **104**, 010502 (2010); 2 Madison, PRL **104**, 010503 (2010); 3 Madison PRA **82**, 030306(R) (2010); 4 AQuA site array, unpublished (2014); 5 Biedermann lab Sandia, arXiv: 1501.03862; 6 AQuA 49 site array, April (2015).



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Interested in adding expertise in

- Design and analysis of quantum error correcting codes, optimization for neutral atom qubits with asymmetric error rates
- Real time hw and sw control systems
- Packaging of electro-optical systems



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## Contact Information

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