

ADAM SHAW

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EDUCATION

California Institute of Technology	Oct 2018 - Apr 2024
Ph.D. PHYSICS, advised by Manuel Endres	
Minor QUANTUM SCIENCE AND ENGINEERING	
Harvey Mudd College , HIGHEST DISTINCTION, GPA: 3.86/4.00	Sep 2014 - May 2018
B.S. PHYSICS Major GPA: 3.96/4.00	

ACADEMIC EMPLOYMENT

Stanford University , Postdoctoral Scholar	Sep 2024 - Present
· <i>Stanford Science Fellow</i>	
· <i>Urbanek-Chodorow Fellow</i>	
· <i>Bloch Fellow</i>	

AWARDS AND HONORS

Selected awards are **highlighted**.

[17] Stanford Science Postdoctoral Fellowship; <i>Stanford University</i>	2024-
[16] Urbanek-Chodorow Postdoctoral Fellowship; <i>Stanford University</i>	2024-
[15] Felix Bloch Postdoctoral Fellowship; <i>Stanford University</i>	2024-
[14] Attendance at the Lindau Nobel Laureate Meeting in Physics; <i>Lindau</i>	2024
[13] Everhart Lecture, supporting; <i>Caltech</i>	2024
[12] Boeing Quantum Creator's Prize; <i>University of Chicago</i>	2023
[11] James A. Cullen Memorial Prize in Physics; <i>Caltech</i>	2023
[10] Finalist; Three Minute Thesis competition; <i>Caltech</i>	2023
[9] Eddleman Graduate Fellowship; <i>Caltech</i>	2021
[8] Applied Physics Research Fellowship; <i>Caltech</i>	2018-2019
[7] Thomas Brown Award for Outstanding Senior Physics Research; <i>Harvey Mudd</i>	2018
[6] Departmental High Honors; <i>Harvey Mudd</i>	2018
[5] Honorable Mention; <i>NSF Graduate Research Fellowship</i>	2018
[4] Best undergraduate poster; <i>The Metals, Minerals, and Materials Conference</i>	2017/2018
[3] Laspa Fellowship; <i>Harvey Mudd</i>	2016-2018
[2] First place; <i>Google Games Irvine</i>	2016/2017
[1] Dean's List; <i>Harvey Mudd</i>	2014-2018

PUBLICATIONS

Selected publications by journal: 4x Nature, 1x Science, 2x Nature Physics, 2x PRX, 1x PRXQ, 2x PRL

† and **highlight** indicates co-first author contribution, * indicates pre-print.

- [17] * RBS Tsai†, X Sun†, **AL Shaw**, R Finkelstein, M Endres. Benchmarking and linear response modeling of high-fidelity Rydberg gates. arXiv:2407.20184, 2024
- [16] * **AL Shaw**†, DK Mark†, J Choi, R Finkelstein, P Scholl, S Choi, M Endres. Universal fluctuations and noise learning from Hilbert-space ergodicity. arXiv:2403.11971, 2024
- [15] DK Mark, FM Surace, A Elben, **AL Shaw**, J Choi, G Refeal, M Endres, S Choi. A maximum entropy principle in deep thermalization and Hilbert-space ergodicity. In press at *PRX*, arXiv:2403.11970, 2024
- [14] R Finkelstein†, RBS Tsai†, X Sun, P Scholl, S Direkci, T Gefen, J Choi, **AL Shaw**, M Endres. Universal quantum operations and ancilla-based readout for tweezer clocks. In press at *Nature*, arXiv:2402.16220, 2024
- [13] **AL Shaw**†, P Scholl†, R Finkelstein†, RBS Tsai, J Choi, M Endres. Erasure-cooling, control, and hyper-entanglement of motion in atom arrays. In press at *Science*, arXiv:2311.15580, 2023
- [12] **AL Shaw**† (**corresponding author**), Z Chen†, J Choi†, DK Mark†, P Scholl, R Finkelstein, A Elben, S Choi, M Endres. Benchmarking highly entangled states on a 60-atom analog quantum simulator. *Nature* 628, 2024

- [11] **AL Shaw**[†], R Finkelstein[†], RBS Tsai, P Scholl, TH Yoon, J Choi, M Endres. Multi-ensemble metrology by programming local rotations with atom movements. *Nature Physics* 20, 2024
- [10] P Scholl[†], **AL Shaw**[†], RBS Tsai, R Finkelstein, J Choi, M Endres. Erasure conversion in a high-fidelity Rydberg quantum simulator. *Nature* 622, 2023
- [9] DK Mark, J Choi, **AL Shaw**, M Endres, S Choi. Benchmarking quantum simulators using ergodic quantum dynamics. *Phys Rev Lett* 131, 2023
- [8] **AL Shaw**, P Scholl, R Finkelstein, IS Madjarov, B Grinkemeyer, M Endres. Dark-state enhanced loading of an optical tweezer array. *Phys Rev Lett* 130, 2023
- [7] JS Cotler[†], DK Mark[†], HY Huang[†], F Hernandez, J Choi, **AL Shaw**, M Endres, S Choi. Emergent quantum state designs from individual many-body wave functions. *Phys Rev X Quantum* 4, 2023
- [6] J Choi[†], **AL Shaw**[†], IS Madjarov, X Xie, R Finkelstein, JP Covey, JS Cotler, DK Mark, HY Huang, A Kale, H Pichler, FGSL Brando, S Choi, M Endres. Preparing random states and benchmarking with many-body quantum chaos. *Nature* 613, 2023
- [5] A Soper, **AL Shaw**, PLJ Conway, GS Pomrehn, M Ferry, L Bassman, A Pribram-Jones, KJ Laws. Assessing MgSc(rare earth) ternary phase stability via constituent binary cluster expansions. *Comp Mat Sci* 207, 2022
- [4] E Hwang, E Cuddy, J Lin, JL Kaufman, **AL Shaw**, PLJ Conway, A Pribram-Jones, KJ Laws, L Bassman. Predicting ductility in quaternary-like alloys. *Phys Rev Mat* 5, 2021
- [3] IS Madjarov[†], JP Covey[†], **AL Shaw**, J Choi, A Kale, A Cooper, H Pichler, V Schkolnik, JR Williams, M Endres. High-fidelity entanglement and detection of alkaline-earth Rydberg atoms. *Nat Phys* 16, 2020
- [2] IS Madjarov, A Cooper, **AL Shaw**, JP Covey, V Schkolnik, TH Yoon, JR Williams, M Endres. An atomic-array optical clock with single-atom readout. *Phys Rev X* 9, 2019
- [1] PLJ Conway, **AL Shaw**, L Bassman, M Ferry, KJ Laws. Stabilisation of disordered bcc phases in magnesium-rare earth alloys. *Mag Tech* 1, 2017

TALKS

* indicates invited talk.

- [15] * High-fidelity and high-entanglement quantum science with tweezer arrays. *Quantum Gases*, Aug 2024
- [14] * Building a quantum computer, one atom at a time. *Lindau Nobel Meeting*, Jul 2024
- [13] * Digital and analog quantum science with tweezer arrays. *DAMOP*, Jun 2024
- [12] * Using chaos to characterize a programmable analog quantum simulator. *Simon's Institute*, Apr 2024
- [11] * Benchmarking large scale quantum devices. *Google Quantum AI*, Jan 2024
- [10] * Benchmarking large scale quantum devices. *Physics of Quantum Electronics (Snowbird)*, Jan 2024
- [9] * Approaching the frontier of analog quantum advantage. *QuEra Computing*, Oct 2023
- [8] * Fingerprints of randomness on a 60-atom quantum simulator. *Quantum Creator's Prize Symposium*, Oct 2023
- [7] Improving clocks by moving atoms. *ReQuIEM collaboration*, Sep 2023
- [6] Experimentally quantifying the boundary between classical and quantum advantage. *DAMOP*, Jun 2023
- [5] * Physics from the bottom: One atom at a time. *Harvey Mudd College physics colloquium*, May 2023
- [4] Improving the optical tweezer platform with atomic dark states. *Quantum systems accelerator colloquium*, May 2023
- [3] * Benchmarking an analog quantum system beyond the exact simulation threshold. *CIQC annual meeting*, Jun 2022
- [2] High-fidelity quantum science with Rydberg atom arrays. *IQIM colloquium*, Nov 2022
- [1] Emergent randomness from many-body quantum chaos. *DAMOP*, Jun 2021