

# Publications

## Anton Frisk Kockum

### Statistics

[Google Scholar](#) (>10,300 citations, h-index 45, i10-index 74)  
Web of Science ResearcherID: [E-8255-2014](#) (>6,100 citations, h-index 37)

| Journal                                      | Publications | Impact factor (2024) |
|----------------------------------------------|--------------|----------------------|
| <i>Nature</i>                                | 1            | 48.5                 |
| <i>Science</i>                               | 1            | 45.8                 |
| <i>Nature Reviews Physics</i>                | 1            | 39.5                 |
| <i>Nature Photonics</i>                      | 1            | 32.9                 |
| <i>Physics Reports</i>                       | 2            | 29.5                 |
| <i>Nature Physics</i>                        | 1            | 18.4                 |
| <i>Physical Review X</i>                     | 1            | 15.7                 |
| <i>Nature Communications</i>                 | 2            | 15.7                 |
| <i>PRX Quantum</i>                           | 4            | 11.0                 |
| <i>Nano Letters</i>                          | 1            | 9.1                  |
| <i>Physical Review Letters</i>               | 16           | 9.0                  |
| <i>npj Quantum Information</i>               | 5            | 8.3                  |
| <i>ACM Transactions on Quantum Computing</i> | 5            | 6.8                  |
| <i>Quantum</i>                               | 2            | 5.4                  |
| <i>Quantum Science and Technology</i>        | 3            | 5.0                  |
| <i>Physical Review Applied</i>               | 2            | 4.4                  |
| <i>Physical Review Research</i>              | 8            | 4.2                  |
| <i>Scientific Reports</i>                    | 3            | 3.9                  |
| <i>Applied Physics Letters</i>               | 1            | 3.6                  |
| <i>Physical Review A</i>                     | 20           | 2.9                  |
| <i>New Journal of Physics</i>                | 3            | 2.8                  |
| <i>Journal of Physics B</i>                  | 1            | 1.5                  |

### Preprints

- Doublon bound states in the continuum through giant atoms**  
Walter Rieck, [Anton Frisk Kockum](#), and Guangze Chen  
arXiv:[2511.18212](#)
- Quantum measurement tomography with mini-batch stochastic gradient descent**  
Akshay Gaikwad, Manuel Sebastian Torres, and [Anton Frisk Kockum](#)  
arXiv:[2511.15682](#)
- Generating spatially separated correlated multiphoton states in nonlinear waveguide quantum electrodynamics**

Jia-Qi Li, [Anton Frisk Kockum](#), and Xin Wang  
arXiv:[2511.14281](#)

**Tunable frequency conversion and comb generation with a superconducting artificial atom**

Fahad Aziz, Zhengqi Niu, Tzu-Yen Hsieh, Kuan Ting Lin, Yu-Huan Huang, Yen-Hsiang Lin, Ching-Yeh Chen, Yu-Ting Cheng, Kai-Min Hsieh, Jeng-Chung Chen, [Anton Frisk Kockum](#), Guin-Dar Lin, Zhi-Rong Lin, Ping-Yi Wen, and Io-Chun Hoi  
arXiv:[2510.26749](#)

**Lattice surgery with Bell measurements: Modular fault-tolerant quantum computation at low entanglement cost**

Trond Hjerpekjøn Haug, Timo Hillmann, [Anton Frisk Kockum](#), and Raphaël Van Laer  
arXiv:[2510.13541](#)

**Efficient three-qubit gates with giant atoms**

Guangze Chen and [Anton Frisk Kockum](#)  
arXiv:[2510.04545](#)

**Overhead in quantum circuits with time-multiplexed qubit control**

Marvin Richter, Ingrid Strandberg, Simone Gasparinetti, and [Anton Frisk Kockum](#)  
arXiv:[2508.20752](#)

**Intrinsic multi-mode interference for passive suppression of Purcell decay in superconducting circuits**

Mustafa Bakr, Mohammed Alghadeer, Simon Pettersson Fors, Simone D. Fasciati, Shuxiang Cao, Atharv Mahajan, Smain Amari, [Anton Frisk Kockum](#), and Peter Leek  
arXiv:[2507.09715](#)

**Generative flow-based warm start of the variational quantum eigensolver**

Hang Zou, Martin Rahm, [Anton Frisk Kockum](#), and Simon Olsson  
arXiv:[2507.01726](#)

**Quantum computing and artificial intelligence: status and perspectives**

Giovanni Acampora, Andris Ambainis, Natalia Ares, Leonardo Banchi, Pallavi Bhardwaj, Daniele Binosi, G. Andrew D. Briggs, Tommaso Calarco, Vedran Dunjko, Jens Eisert, Olivier Ezratty, Paul Erker, Federico Fedele, Elies Gil-Fuster, Martin Gärttner, Mats Granath, Markus Heyl, Iordanis Kerenidis, Matthias Klusch, [Anton Frisk Kockum](#), Richard Kueng, Mario Krenn, Jörg Lässig, Antonio Macaluso, Sabrina Maniscalco, Florian Marquardt, Kristel Michielsen, Gorka Muñoz-Gil, Daniel Müssig, Hendrik Poulsen Nautrup, Evert van Nieuwenburg, Roman Orus, Jörg Schmiedmayer, Markus Schmitt, Philipp Slusallek, Filippo Vicentini, Christof Weitenberg, and Frank K. Wilhelm  
arXiv:[2505.23860](#)

**Sequential decoding of the  $XYZ^2$  hexagonal stabilizer code**

Basudha Srivastava, Yinzi Xiao, [Anton Frisk Kockum](#), Ben Criger, and Mats Granath  
arXiv:[2505.03691](#)

**Selective and efficient quantum state tomography for multi-qubit systems**

Aniket Patel, Akshay Gaikwad, Tangyou Huang, [Anton Frisk Kockum](#), and Tahereh Abad  
arXiv:[2503.20979](#)

**Scalable quantum simulator with an extended gate set in giant atoms**

Guangze Chen and [Anton Frisk Kockum](#)  
arXiv:[2503.04537](#)

**Engineering the environment of a superconducting qubit with an artificial giant atom**

Jingjing Hu, Dengfeng Li, Yufan Qie, Zelong Yin, [Anton Frisk Kockum](#), Franco Nori, and Shuoming An

arXiv:[2410.15377](#)

**Fast unconditional reset and leakage reduction in fixed-frequency transmon qubits**

Liangyu Chen, Simon Pettersson Fors, Zixian Yan, Anaida Ali, Tahereh Abad, Amr Osman, Eleftherios Moschandreas, Benjamin Lienhard, Sandoko Kosen, Hang-Xi Li, Daryoush Shiri, Tong Liu, Stefan Hill, Abdullah-Al Amin, Robert Rehammar, Mamta Dahiya, Andreas Nylander, Marcus Rommel, Anita Fadavi Roudsari, Marco Caputo, Leif Grönberg, Joonas Govenius, Miroslav Dobsicek, Michele Faucci Giannelli, [Anton Frisk Kockum](#), Jonas Bylander, and Giovanna Tancredi

arXiv:[2409.16748](#)

**Comprehensive explanation of ZZ coupling in superconducting qubits**

Simon Pettersson Fors, Jorge Fernández-Pendás, and [Anton Frisk Kockum](#)

arXiv:[2408.15402](#)

**Nonlinear chiral quantum optics with giant-emitter pairs**

Xin Wang, Jia-Qi Li, Zhihai Wang, [Anton Frisk Kockum](#), Lei Du, Tao Liu, and Franco Nori

arXiv:[2404.09829](#)

**Detecting quantum speedup of random walks with machine learning**

Hanna Linn, Yu Zheng, and [Anton Frisk Kockum](#)

arXiv:[2309.02212](#)

**Synthesizing electromagnetically induced transparency without a control field in waveguide QED using small and giant atoms**

Andreas Ask, Yao-Lung L. Fang, and [Anton Frisk Kockum](#)

arXiv:[2011.15077](#)

**Published articles**

**80. Quantum process tomography with digital twins of error matrices**

Tangyou Huang, Akshay Gaikwad, Ilya Moskalenko, Anuj Aggarwal, Tahereh Abad, Marko Kuzmanović, Yu-Han Chang, Ognjen Stanisavljević, Emil Hogedal, Christopher Warren, Irshad Ahmad, Janka Biznárová, Amr Osman, Mamta Dahiya, Marcus Rommel, Anita Fadavi Roudsari, Andreas Nylander, Liangyu Chen, Jonas Bylander, Gheorghe Sorin Paraoanu, [Anton Frisk Kockum](#), and Giovanna Tancredi

*Physical Review Letters* **135**, 230601 (2025)

arXiv:[2505.07725](#)

**79. Dressed interference in giant superatoms: entanglement generation and transfer**

Lei Du, Xin Wang, [Anton Frisk Kockum](#), and Janine Splettstoesser

*Physical Review Letters* **135**, 223601 (2025)

arXiv:[2504.12942](#)

**78. Simulation of quantum computers: review and acceleration opportunities**

Alessio Cicero, Mohammad Ali Maleki, Muhammad Waqar Azhar, [Anton Frisk Kockum](#),

and Pedro Trancoso

*ACM Transactions on Quantum Computing* **7**, 3 (2025)

arXiv:2410.12660

**77. Gradient-descent methods for fast quantum state tomography**

Akshay Gaikwad, Manuel Sebastian Torres, Shahnawaz Ahmed, and Anton Frisk Kockum  
*Quantum Science and Technology* **10**, 045055 (2025)

arXiv:2503.04526

**76. Group delay controlled by the decoherence of a single artificial atom**

Yu-Ting Cheng, Kai-Min Hsieh, Bang-Yao Wu, Zheng-Qi Niu, Fahad Aziz, Yu-Huan Huang, Ping Yi Wen, Kuan-Ting Lin, Yen-Hsiang Lin, Jeng Chung Chen, Anton Frisk Kockum, Guin-Dar Lin, Zhi-Rong Lin, Yong Lu, and Io-Chun Hoi

*Physical Review Letters* **135**, 073601 (2025)

arXiv:2409.07731

**75. Quantum SWAP gate realized with CZ and iSWAP gates in a superconducting architecture**

Christian Križan, Janka Biznárová, Liangyu Chen, Emil Hogedal, Amr Osman, Christopher W. Warren, Sandoko Kosen, Hang-Xi Li, Tahereh Abad, Anuj Aggarwal, Marco Caputo, Jorge Fernández-Pendás, Akshay Gaikwad, Leif Grönberg, Andreas Nylander, Robert Rehammar, Marcus Rommel, Olga I. Yuzepovich, Anton Frisk Kockum, Joonas Govenius, Giovanna Tancredi, and Jonas Bylander

*New Journal of Physics* **27**, 074507 (2025)

arXiv:2412.15022

**74. Tunable coherent microwave beam splitter and combiner at the single-photon level**

Yu-Huan Huang, Kai-Min Hsieh, Fahad Aziz, Zheng-Qi Niu, Ping-Yi Wen, Yu-Ting Cheng, Yi-Shin Tsai, Jeng-Chung Chen, Xin Wang, Anton Frisk Kockum, Zhi-Rong Lin, Yen-Hsiang Lin, and Io-Chun Hoi

*Applied Physics Letters* **127**, 014002 (2025)

arXiv:2503.20353

**73. Deterministic generation of frequency-bin-encoded microwave photons**

Jiaying Yang, Maryam Khanahmadi, Ingrid Strandberg, Akshay Gaikwad, Claudia Castillo-Moreno, Anton Frisk Kockum, Muhammad Asad Ullah, Göran Johansson, Axel Martin Eriksson, and Simone Gasparinetti

*Physical Review Letters* **134**, 240803 (2025)

arXiv:2410.23202

**72. Entanglement of photonic modes from a continuously driven two-level system**

Jiaying Yang, Ingrid Strandberg, Alejandro Vivas-Viaña, Akshay Gaikwad, Claudia Castillo-Moreno, Anton Frisk Kockum, Muhammad Asad Ullah, Carlos Sánchez Muñoz, Axel Martin Eriksson, and Simone Gasparinetti

*npj Quantum Information* **11**, 69 (2025)

arXiv:2407.07991

**71. Impact of decoherence on the fidelity of quantum gates leaving the computational subspace**

Tahereh Abad, Yoni Schattner, Anton Frisk Kockum, and Göran Johansson

*Quantum* **9**, 1684 (2025)

arXiv:2302.13885

70. **Nearly quantum-limited microwave amplification via interfering degenerate stimulated emission in a single artificial atom**  
 Fahad Aziz, Kuan-Ting Lin, Ping-Yi Wen, Samina, Yu-Chen Lin, Emely Wiegand, Ching-Ping Lee, Yu-Ting Cheng, Yong Lu, Ching-Yeh Chen, Chin-Hsun Chien, Kai-Min Hsieh, Yu-Huan Huang, Haw-Tyng Huang, Hou Ian, Jeng-Chung Chen, Yen-Hsiang Lin, Anton Frisk Kockum, Guin-Dar Lin, and Io-Chun Hoi  
[\*npj Quantum Information\* \*\*11\*\*, 45 \(2025\)](#)  
[arXiv:2302.07442](#)
69. **Unconventional and robust light-matter interactions based on the non-Hermitian skin effect**  
 Lei Du and Anton Frisk Kockum  
[\*Physical Review Research\* \*\*7\*\*, 013140 \(2025\)](#)  
[arXiv:2408.09826](#)
68. **Simulating open quantum systems with giant atoms**  
 Guangze Chen and Anton Frisk Kockum  
[\*Quantum Science and Technology\* \*\*10\*\*, 025028 \(2025\)](#)  
[arXiv:2406.13678](#)
67. **Entangling Schrödinger’s cat states by bridging discrete- and continuous-variable encoding**  
 Daisuke Hoshi, Toshiaki Nagase, Sangil Kwon, Daisuke Iyama, Takahiko Kamiya, Shiori Fujii, Hiroto Mukai, Shahnawaz Ahmed, Anton Frisk Kockum, Shohei Watabe, Fumiki Yoshihara, and Jaw-Shen Tsai  
[\*Nature Communications\* \*\*16\*\*, 1309 \(2025\)](#)  
[arXiv:2406.17999](#)
66. **Measuring the quantum state of photoelectrons**  
 Hugo Laurell, Sizuo Luo, Robin Weissenbilder, Mattias Ammitzböll, Shahnawaz Ahmed, Hugo Söderberg, C. Leon M. Petersson, Vénus Poulain, Chen Guo, Christoph Dittel, Daniel Finkelstein-Shapiro, Richard J. Squibb, Raimund Feifel, Mathieu Gisselbrecht, Cord L. Arnold, Andreas Buchleitner, Eva Lindroth, Anton Frisk Kockum, Anne L’Huillier, and David Busto  
[\*Nature Photonics\* \*\*19\*\*, 352 \(2025\)](#)  
[arXiv:2309.13945](#)
65. **Avoiding decoherence with giant atoms in a two-dimensional structured environment**  
 Emil Raaholt Ingelsten, Anton Frisk Kockum, and Ariadna Soro  
[\*Physical Review Research\* \*\*6\*\*, 043222 \(2024\)](#)  
[arXiv:2402.10879](#)
64. **Applying quantum approximate optimization to the heterogeneous vehicle routing problem**  
 David Fitzek, Toheed Ghandriz, Leo Laine, Mats Granath, and Anton Frisk Kockum  
[\*Scientific Reports\* \*\*14\*\*, 25415 \(2024\)](#)  
[arXiv:2110.06799](#)
63. **Heralding entangled optical photons from a microwave quantum processor**  
 Trond Hjerpekjøn Haug, Anton Frisk Kockum, and Raphaël Van Laer  
[\*Physical Review Applied\* \*\*22\*\*, 034068 \(2024\)](#)  
[arXiv:2308.14173](#)

62. **Signal crosstalk in a flip-chip quantum processor**  
 Sandoko Kosen, Hang-Xi Li, Marcus Rommel, Robert Rehammar, Marco Caputo, Leif Grönberg, Jorge Fernández-Pendás, Anton Frisk Kockum, Janka Biznárová, Liangyu Chen, Christian Križan, Andreas Nylander, Amr Osman, Anita Fadavi Roudsari, Daryoush Shiri, Giovanna Tancredi, Joonas Govenius, and Jonas Bylander  
[\*PRX Quantum\* \*\*5\*\*, 030350 \(2024\)](#)  
 Selected for an accompanying Synopsis in [\*Physics\* \*\*17\*\*, s113 \(2024\)](#)  
[arXiv:2403.00285](#)
61. **Extended quantum process tomography of logical operations on an encoded bosonic qubit**  
 Mikael Kervinen, Shahnawaz Ahmed, Marina Kudra, Axel Eriksson, Fernando Quijandría, Anton Frisk Kockum, Per Delsing, and Simone Gasparinetti  
[\*Physical Review A\* \*\*110\*\*, L020401 \(2024\)](#)  
[arXiv:2303.01451](#)
60. **Quantum amplification and simulation of strong and ultrastrong coupling of light and matter**  
 Wei Qin, Anton Frisk Kockum, Carlos Sánchez Muñoz, Adam Miranowicz, and Franco Nori  
[\*Physics Reports\* \*\*1078\*\*, 1–59 \(2024\)](#)  
[arXiv:2401.04949](#)
59. **Tuning atom-field interaction via phase shaping**  
 Yu-Ting Cheng, Chin-Hsun Chien, Kai-Min Hsieh, Yu-Huan Huang, Ping Yi Wen, Wei-Ju Lin, Yong Lu, Fahad Aziz, Ching-Ping Lee, Kuan-Ting Lin, Ching-Yeh Chen, Jeng-Chung Chen, Chih-Sung Chuu, Anton Frisk Kockum, Guin-Dar Lin, Yen-Hsiang Lin, and Io-Chun Hoi  
[\*Physical Review A\* \*\*109\*\*, 023705 \(2024\)](#)  
[arXiv:2305.13750](#)
58. **Giant emitters in a structured bath with non-Hermitian skin effect**  
 Lei Du, Lingzhen Guo, Yan Zhang, and Anton Frisk Kockum  
[\*Physical Review Research\* \*\*5\*\*, L042040 \(2023\)](#)  
[arXiv:2308.16148](#)
57. **Unconventional saturation effects at intermediate drive in a lossy cavity coupled to few emitters**  
 Therese Karmstrand, Benjamin Rousseaux, Anton Frisk Kockum, Timur Shegai, and Göran Johansson  
[\*Physical Review A\* \*\*108\*\*, 053706 \(2023\)](#)  
[arXiv:2110.00595](#)
56. **Mitigation of frequency collisions in superconducting quantum processors**  
 Amr Osman, Jorge Fernández-Pendás, Christopher Warren, Sandoko Kosen, Marco Scigliuzzo, Anton Frisk Kockum, Giovanna Tancredi, Anita Fadavi Roudsari, and Jonas Bylander  
[\*Physical Review Research\* \*\*5\*\*, 043001 \(2023\)](#)  
[arXiv:2303.04663](#)
55. **Gaussian conversion protocol for heralded generation of generalized Gottesman-Kitaev-Preskill states**  
 Yu Zheng, Alessandro Ferraro, Anton Frisk Kockum, and Giulia Ferrini  
[\*Physical Review A\* \*\*108\*\*, 012603 \(2023\)](#)  
[arXiv:2301.10030](#)

54. **Extensive characterization and implementation of a family of efficient three-qubit gates at the coherence limit**  
 Christopher W. Warren, Jorge Fernández-Pendás, Shahnawaz Ahmed, Tahereh Abad, Andreas Bengtsson, Janka Biznárová, Kamanasish Debnath, Xiu Gu, Christian Križan, Amr Osman, Anita Fadavi Roudsari, Per Delsing, Göran Johansson, Anton Frisk Kockum, Giovanna Tancredi, and Jonas Bylander  
[\*npj Quantum Information\* \*\*9\*\*, 44 \(2023\)](#)  
[arXiv:2207.02938](#)
53. **Gradient-descent quantum process tomography by learning Kraus operators**  
 Shahnawaz Ahmed, Fernando Quijandría, and Anton Frisk Kockum  
[\*Physical Review Letters\* \*\*130\*\*, 150402 \(2023\)](#)  
[arXiv:2208.00812](#)
52. **Transmon qubit readout fidelity at the threshold for quantum error correction without a quantum-limited amplifier**  
 Liangyu Chen, Hang-Xi Li, Yong Lu, Christopher W. Warren, Christian J. Križan, Sandoko Kosen, Marcus Rommel, Shahnawaz Ahmed, Amr Osman, Janka Biznárová, Anita Fadavi Roudsari, Benjamin Lienhard, Marco Caputo, Kestutis Grigoras, Leif Grönberg, Joonas Govenius, Anton Frisk Kockum, Per Delsing, Jonas Bylander, and Giovanna Tancredi  
[\*npj Quantum Information\* \*\*9\*\*, 26 \(2023\)](#)  
[arXiv:2208.05879](#)
51. **Interaction between giant atoms in a one-dimensional structured environment**  
 Ariadna Soro, Carlos Sánchez Muñoz, and Anton Frisk Kockum  
[\*Physical Review A\* \*\*107\*\*, 013710 \(2023\)](#)  
 Highlighted by *Physical Review A* as one of their most downloaded papers in 2023  
 (8 out of 2132 papers highlighted)  
[arXiv:2208.04102](#)
50. **Universal fidelity reduction of quantum operations from weak dissipation**  
 Tahereh Abad, Jorge Fernández-Pendás, Anton Frisk Kockum, and Göran Johansson  
[\*Physical Review Letters\* \*\*129\*\*, 150504 \(2022\)](#)  
[arXiv:2110.15883](#)
49. **Deterministic loading and phase shaping of microwaves onto a single artificial atom**  
 Wei-Ju Lin, Yong Lu, Ping-Yi Wen, Yu-Ting Chen, Ching-Ping Lee, Kuan-Ting Lin, Kuan-Hsun Chiang, Ming Che Hsieh, Jeng-Chung Chen, C.-S. Chuu, Franco Nori, Anton Frisk Kockum, Guin-Dar Lin, Per Delsing, and Io-Chun Hoi  
[\*Nano Letters\* \*\*22\*\*, 8137 \(2022\)](#)  
[arXiv:2012.15084](#)
48. **Robust preparation of Wigner-negative states with optimized SNAP-displacement sequences**  
 Marina Kudra, Mikael Kervinen, Ingrid Strandberg, Shahnawaz Ahmed, Marco Scigliuzzo, Amr Osman, Daniel Pérez Lozano, Mats O. Tholén, Riccardo Borgani, David B. Haviland, Giulia Ferrini, Jonas Bylander, Anton Frisk Kockum, Fernando Quijandría, Per Delsing, and Simone Gasparinetti  
[\*PRX Quantum\* \*\*3\*\*, 030301 \(2022\)](#)  
 Selected as an Editors' Suggestion  
[arXiv:2111.07965](#)

47. **Building blocks of a flip-chip integrated superconducting quantum processor**  
 Sandoko Kosen, Hang-Xi Li, Marcus Rommel, Daryoush Shiri, Christopher Warren, Leif Grönberg, Jaakko Salonen, Tahereh Abad, Janka Biznárová, Marco Caputo, Liangyu Chen, Kestutis Grigoras, Göran Johansson, [Anton Frisk Kockum](#), Christian Križan, Daniel Pérez Lozano, Graham J. Norris, Amr Osman, Jorge Fernández-Pendás, Anita Fadavi Roudsari, Slawomir Simbierowicz, Giovanna Tancredi, Andreas Wallraff, Christopher Eichler, Joonas Govenius, and Jonas Bylander  
[Quantum Science and Technology](#) **7**, 035018 (2022)  
[arXiv:2112.02717](#)
46. **Giant atoms in a synthetic frequency dimension**  
 Lei Du, Yan Zhang, Jin-Hui Wu, [Anton Frisk Kockum](#), and Yong Li  
[Physical Review Letters](#) **128**, 223602 (2022)  
[arXiv:2111.05584](#)
45. **The  $XYZ^2$  hexagonal stabilizer code**  
 Basudha Srivastava, [Anton Frisk Kockum](#), and Mats Granath  
[Quantum](#) **6**, 698 (2022)  
[arXiv:2112.06036](#)
44. **Error-rate-agnostic decoding of topological stabilizer codes**  
 Karl Hammar, Alexei Orekhov, Patrik Wallin Hybelius, Anna Katariina Wisakanto, Basudha Srivastava, [Anton Frisk Kockum](#), and Mats Granath  
[Physical Review A](#) **105**, 042616 (2022)  
[arXiv:2112.01977](#)
43. **Deterministic one-way logic gates on a cloud quantum computer**  
 Zhi-Peng Yang, Alakesh Baishya, Huan-Yu Ku, Yu-Ran Zhang, [Anton Frisk Kockum](#), Yueh-Nan Chen, Fu-Li Li, Jaw-Shen Tsai, and Franco Nori  
[Physical Review A](#) **105**, 042610 (2022)  
[arXiv:2108.03865](#)
42. **Steady-state heat transport and work with a single artificial atom coupled to a waveguide: emission without external driving**  
 Yong Lu, Neill Lambert, [Anton Frisk Kockum](#), Ken Funo, Andreas Bengtsson, Simone Gasparinetti, Franco Nori, and Per Delsing  
[PRX Quantum](#) **3**, 020305 (2022)  
[arXiv:2107.12700](#)
41. **Organic charged polaritons in the ultrastrong coupling regime**  
 Mao Wang, Suman Mallick, [Anton Frisk Kockum](#), and Karl Börjesson  
[Physical Review Research](#) **4**, 023016 (2022)  
[arXiv:2108.13901](#)
40. **Revealing higher-order light and matter energy exchanges using quantum trajectories in ultrastrong coupling**  
 Vincenzo Macrì, Fabrizio Minganti, [Anton Frisk Kockum](#), Alessandro Ridolfo, Salvatore Savasta, and Franco Nori  
[Physical Review A](#) **105**, 023720 (2022)  
[arXiv:2107.08759](#)
39. **Chiral quantum optics with giant atoms**  
 Ariadna Soro and [Anton Frisk Kockum](#)  
[Physical Review A](#) **105**, 023712 (2022)  
[arXiv:2106.11946](#)

38. **Fast multi-qubit gates through simultaneous two-qubit gates**  
 Xiu Gu, Jorge Fernández-Pendás, Pontus Vikstål, Tahereh Abad, Christopher Warren, Andreas Bengtsson, Giovanna Tancredi, Vitaly Shumeiko, Jonas Bylander, Göran Johansson, and [Anton Frisk Kockum](#)  
[PRX Quantum](#) **2**, 040348 (2021)  
[arXiv:2108.11358](#)
37. **Classification and reconstruction of optical quantum states with deep neural networks**  
 Shahnawaz Ahmed, Carlos Sánchez Muñoz, Franco Nori, and [Anton Frisk Kockum](#)  
[Physical Review Research](#) **3**, 033278 (2021)  
[arXiv:2012.02185](#)
36. **Quantum state tomography with conditional generative adversarial networks**  
 Shahnawaz Ahmed, Carlos Sánchez Muñoz, Franco Nori, and [Anton Frisk Kockum](#)  
[Physical Review Letters](#) **127**, 140502 (2021)  
[arXiv:2008.03240](#)
35. **Ultimate quantum limit for amplification: a single atom in front of a mirror**  
 Emely Wiegand, Ping-Yi Wen, Per Delsing, Io-Chun Hoi, and [Anton Frisk Kockum](#)  
[New Journal of Physics](#) **23**, 043048 (2021)  
[arXiv:2012.09800](#)
34. **Characterizing decoherence rates of a superconducting qubit by direct microwave scattering**  
 Yong Lu, Andreas Bengtsson, Jonathan J. Burnett, Emely Wiegand, Baladitya Suri, Philip Krantz, Anita Fadavi Roudsari, [Anton Frisk Kockum](#), Simone Gasparinetti, Göran Johansson, and Per Delsing  
[npj Quantum Information](#) **7**, 35 (2021)  
[arXiv:1912.02124](#)
33. **Engineering the level structure of a giant artificial atom in waveguide quantum electrodynamics**  
 A. M. Vadiraj, Andreas Ask, Thomas G. McConkey, Ibrahim Nsanzineza, C. W. Sandbo Chang, [Anton Frisk Kockum](#), and C. M. Wilson  
[Physical Review A](#) **103**, 023710 (2021)  
[arXiv:2003.14167](#)
32. **Tunable chiral bound states with giant atoms**  
 Xin Wang, Tao Liu, [Anton Frisk Kockum](#), Hong-Rong Li, and Franco Nori  
[Physical Review Letters](#) **126**, 043602 (2021)  
[arXiv:2008.13560](#)
31. **Oscillating bound states for a giant atom**  
 Lingzhen Guo, [Anton Frisk Kockum](#), Florian Marquardt, and Göran Johansson  
[Physical Review Research](#) **2**, 043014 (2020)  
[arXiv:1911.13028](#)
30. **Simulating ultrastrong-coupling processes breaking parity conservation in Jaynes–Cummings systems**  
 Carlos Sánchez Muñoz, [Anton Frisk Kockum](#), Adam Miranowicz, and Franco Nori  
[Physical Review A](#) **102**, 033716 (2020)  
[arXiv:1910.12875](#)

29. **Improved success probability with greater circuit depth for the quantum approximate optimization algorithm**  
 Andreas Bengtsson, Pontus Vikstål, Christopher Warren, Marika Svensson, Xiu Gu, [Anton Frisk Kockum](#), Philip Krantz, Christian Križan, Daryoush Shiri, Ida-Maria Svensson, Giovanna Tancredi, Göran Johansson, Per Delsing, Giulia Ferrini, and Jonas Bylander  
*Physical Review Applied* **14**, 034010 (2020)  
[arXiv:1912.10495](#)
28. **Waveguide quantum electrodynamics with giant superconducting artificial atoms**  
 Bharath Kannan, Max J. Ruckriegel, Daniel L. Campbell, [Anton Frisk Kockum](#), Jochen Braumüller, David K. Kim, Morten Kjaergaard, Philip Krantz, Alexander Melville, Bethany M. Niedzielski, Antti Vepsäläinen, Roni Winik, Jonilyn L. Yoder, Franco Nori, Terry P. Orlando, Simon Gustavsson, and William D. Oliver  
*Nature* **583**, 775 (2020)  
[arXiv:1912.12233](#)
27. **Deep Q-learning decoder for depolarizing noise on the toric code**  
 David Fitzek, Mattias Eliasson, [Anton Frisk Kockum](#), and Mats Granath  
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