

## Jacob E. Muldoon

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### Institution:

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Department of Physics, LD 154  
Indiana University Purdue University of Indianapolis (IUPUI)  
402 N. Blackford Street, Indianapolis, IN 46202

**Research Interests:** PT Symmetry, Open Quantum Systems, Quantum Maps, Condensed Matter, Superconducting Circuits, Quantum Information

### Education

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Ph.D. (Physics)	(IUPUI), August 2022
M.S. (Physics)	(IUPUI), May 2018
B.S. (Physics)	(IUPUI), May 2015
B.S. (Chemistry)	(IUPUI), December 2015

### Professional & Teaching Experience

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Post-Doctoral Fellow	Department of Physics (WUSTL), 2024 - Present
Post-Doctoral Fellow	Department of Physics (IUPUI), 2022 - 2024
SEED & STEM Program Mentor	Department of Physics (IUPUI), 2019 - Present
Research Assistant	Department of Physics (IUPUI), 2021 - 2022
Undergraduate Instructor (Recitation, Lab)	Department of Physics (IUPUI), 2013 - 2022

### Publications

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1. W. Chen, M. Abbasi, S. Erdamar, J. Muldoon, Y. N. Joglekar, and K. W. Murch. Engineering nonequilibrium steady states through floquet liouvillians, 2024, <https://doi.org/10.48550/arXiv.2403.09769>
2. J. Muldoon and Y. N. Joglekar.  $\mathcal{PT}$ -symmetry breaking in quantum spin chains with exceptional non-hermiticities. *Physical Review A*, 108(6), Dec. 2023, <http://doi.org/10.1103/PhysRevA.108.062205>
3. A. Quinn, J. Metzner, J. E. Muldoon, I. D. Moore, S. Brudney, S. Das, D. T. C. Allcock, and Y. N. Joglekar. Observing super-quantum correlations across the exceptional point in a single, two-level trapped ion, 2023, <https://doi.org/10.48550/arXiv.2304.12413>
4. S. Erdamar, M. Abbasi, B. Ha, W. Chen, J. Muldoon, Y. Joglekar, and K. W. Murch. Constraining work fluctuations of non-hermitian dynamics across the exceptional point of a superconducting qubit, 2023, <https://doi.org/10.48550/arXiv.2309.12393>
5. A. V. Varma, J. E. Muldoon, S. Paul, Y. N. Joglekar, and S. Das. Extreme violation of the leggett-garg inequality in nonunitary dynamics with complex energies. *Physical Review A*, 108(3):032202, Sept. 2023, <https://doi.org/10.1103/PhysRevA.108.032202>
6. K. S. Agarwal, J. Muldoon, and Y. N. Joglekar. Conserved quantities in non-hermitian systems via vectorization method. *Acta Polytechnica*, 62(1):1-7, feb 2022, <https://doi.org/10.14311/AP.2022.62.0001>
7. J. Gunderson, J. Muldoon, K. W. Murch, and Y. N. Joglekar. Floquet exceptional contours in lindblad dynamics with time-periodic drive and dissipation. *Physical Review A*, 103(2):023718, feb 2021, <https://doi.org/10.1103/PhysRevA.103.023718>

### Conferences

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1. J. Muldoon. Super-quantum correlations across the exceptional point (revision). Center for Quantum Technologies (Seminar), Indianapolis, Indiana, US, Oct. 2023
2. J. Muldoon. Super-quantum correlations across the exceptional point. 3rd Annual Quantum Summer School (Seminar), West Lafayette, Indiana, US, Apr. 2023
3. J. Muldoon. Floquet exceptional contours in lindblad dynamics with time-periodic drive and dissipation. Pseudo-Hermitian Hamiltonians in Quantum Physics (PTSeminar), London, United Kingdom, Sept. 2021

### Grants & Awards

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(IUPUI) School of Science Outstanding Graduate Student Award	Spring 2022
(IUPUI) School of Science Dean's List, Fall 2011	Spring 2015
(IUPUI) School of Science Scholar's List Recipient	Fall 2011 - Spring 2015
(IUPUI) Honors College Member	Fall 2011 - Spring 2015
(BSA) Eagle Scout Award	October 2011