# Curriculum Vitae - Shimon Kolkowitz

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## Research Appointments

*University of California, Berkeley*

- Herst Chair Associate Professor of Physics - Department of Physics, July, 2023 - present.
- Visiting Associate Professor - Department of Physics, November, 2022 - June, 2023.

*University of Wisconsin - Madison*

- Associate Professor - Department of Physics, July, 2022 - June, 2023.
- Assistant Professor - Department of Physics, January, 2018 - July, 2022.
- Faculty Affiliate - Department of Engineering Physics, 2019 - 2023.

*JILA, NIST, and University of Colorado, Boulder*

- National Research Council (NRC) postdoctoral research associate, 2015 - 2017.

## Education

- Ph.D. Physics, Harvard University, 2015.
- A.M. Physics, Harvard University, 2011.
- B.S. Physics, *with distinction*, Stanford University, 2008.

## Honors and Awards

- Moore Foundation Experimental Physics Investigator, 2024.
- Sloan Research Fellowship, 2022.
- NSF CAREER Award, 2022.
- International Quantum U Tech Accelerator (AFRL/AFOSR) competition winner, 2020.
- Packard Fellowship for Science and Engineering, 2019.
- Gordon and Betty Moore Foundation Lectureship Award, 2019.

- National Research Council (NRC) Postdoctoral Fellowship, 2015 - 2017.
- Outstanding Presentation Award, NIST Boulder Laboratories Postdoctoral Poster Symposium, 2016.
- National Science Foundation Graduate Research Fellowship, 2013 - 2015.
- National Defense Science and Engineering Graduate Fellowship, 2010 - 2013.

## Journal publications

- M. Cambria, S. Chand, C.M. Reiter, and S. Kolkowitz, "Scalable parallel measurement of individual nitrogen-vacancy centers," accepted for publication at *Physical Review X* (2025). https://arxiv.org/abs/2408.11715
- M.A. Wolfe, B.X. Coe, J.S. Edwards, T.J. Kovach, T. McJunkin, B. Harpt, D.E. Savage, M.G. Lagally, R. McDermott, M. Friesen, S. Kolkowitz, and M.A. Eriksson, "Control of threshold voltages in Si/SiGe quantum devices via optical illumination," *Physical Review Applied* **22** 034044 (2024). https://journals.aps.org/prapplied/abstract/10.1103/PhysRevApplied.22.034044
- Z. Yuan, S. Mukherjee, A. Gardill, J.D. Thompson, S. Kolkowitz, N.P. de Leon, "An instructional lab apparatus for quantum experiments with single nitrogen-vacancy centers in diamond," *American Journal of Physics*, **92** 892-900 (2024). https://pubs.aip.org/aapt/ajp/article/92/11/892/3317286
- P. Niroula, J. Dolde, X. Zheng, J. Bringewatt, A. Ehrenberg, K.C. Cox, J. Thompson, M.J. Gullans, S. Kolkowitz, and A.V. Gorshkov, "Quantum Sensing with Erasure Qubits," *Physical Review Letters*, **133** 080801 (2024). https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.133.080801
- R. Vidrio, D. Vincent, B. Bachman, C. Saucedo, M. Zahedian, Z. Xu, J. Lai, T.A. Grotjohn, S. Kolkowitz, J.-H. Seo, R.J. Hamers, K.G. Ray, Z. Ma, J.T. Choy, "XPS analysis of molecular contamination and $sp^2$ amorphous carbon on oxidized (100) diamond," *Materials for Quantum Technology*, **4** 025201 (2024). https://iopscience.iop.org/article/10.1088/2633-4356/ad4e8a/pdf
- X. Zheng, J. Dolde, and S. Kolkowitz, "Reducing the instability of an optical lattice clock using multiple atomic ensembles," *Physical Review X*, **14** 011006 (2024). https://journals.aps.org/prx/abstract/10.1103/PhysRevX.14.011006
- M.C. Cambria, G. Theiring, A. Norambuena, H.T. Dinani, A. Gardill, I. Kemeny, V. Lordi, A. Gali, J.R. Maze, and S. Kolkowitz, "A physically motivated analytical expression for the temperature dependence of the zero-field splitting of the nitrogen-vacancy center in diamond," *Physical Review B*, **108** L180102 (2023). https://journals.aps.org/prb/abstract/10.1103/PhysRevB.108.L180102
- X. Zheng, J. Dolde, M.C. Cambria, H.M. Lim, and S. Kolkowitz, "A lab-based test of the gravitational redshift with a miniature clock network," *Nature Communications*, **14** 4886

(2023).
https://www.nature.com/articles/s41467-023-40629-8

- D.F. Jackson Kimball, D. Budker, T.E. Chupp, A.A. Geraci, S. Kolkowitz, J .T. Singh, and A.O. Sushkov, "Probing fundamental physics with spin-based quantum sensors," *Physical Review A*, **108** 010101 (2023).
https://journals.aps.org/pra/abstract/10.1103/PhysRevA.108.010101

- M.C. Cambria, A. Norambuena, H.T. Dinani, G. Theiring, A. Gardill, I. Kemeny, Y. Li, V. Lordi, A. Gali, J.R. Maze, and S. Kolkowitz, "Temperature-dependent phonon-induced relaxation of the nitrogen-vacancy spin triplet in diamond," *Physical Review Letters*, **130** 256903 (2023).
https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.130.256903

- M. Zahedian, J. Liu, R. Vidrio, S. Kolkowitz, and J.T. Choy, "Modeling of Radiative Emission from Shallow Color Centers in Single Crystalline Diamond," *Laser and Photonics Review*, 2200529 (2023). https://doi.org/10.1002/lpor.202200529

- J. Rovny, Z. Yuan, M. Fitzpatrick, A.I. Abdalla, L. Futamura, C. Fox, M.C. Cambria, S. Kolkowitz, and N.P. de Leon, "Nanoscale covariance magnetometry with diamond quantum sensors," *Science*, **378**, no. 6626 (2022). https://doi.org/10.1126/science.ade9858

- I. Alonso, et al. "Cold Atoms in Space: Community Workshop Summary and Proposed Road-Map." *EPJ Quantum Technology* **9** (1), 1-55 (2022). https://doi.org/10.1140/epjqt/s40507-022-00147-w

- V. Schkolnik, et al. "Optical Atomic Clock aboard an Earth-orbiting Space Station (OACESS): Enhancing searches for physics beyond the standard model in space." *Quantum Science and Technology* **8** (1), 014003 (2022). https://doi.org/10.1088/2058-9565/ac9f2b

- A. Gardill, I. Kemeny, Y. Li, M. Zahedian, M.C. Cambria, X. Xu, V. Lordi, A. Gali, J.R. Maze, J. Choy, and S. Kolkowitz, "Super-resolution Airy disk microscopy of individual color centers in diamond," *ACS Photonics*, (2022). https://doi.org/10.1021/acsphotonics.2c00713

- X. Zheng, J. Dolde, V. Lochab, B.N. Merriman, H. Li, and S. Kolkowitz, "Differential clock comparisons with a multiplexed optical lattice clock," *Nature* **602**, 425-430 (2022).
https://www.nature.com/articles/s41586-021-04344-y

- Y. Wu, S. Kolkowitz, S. Puri, and J.D. Thompson, "Erasure conversion for fault-tolerant quantum computing in alkaline earth Rydberg atom arrays," *Nature Communications*, **13**, 4657 (2022). https://www.nature.com/articles/s41467-022-32094-6

- A. Gardill, I. Kemeny, M.C. Cambria, Y. Li, H.T. Dinani, A. Norambuena, J.R. Maze, V. Lordi, and S. Kolkowitz, "Probing charge dynamics in diamond with an individual color center," *Nano Letters*, **21** (16), 6960-6966 (2021).
https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.1c02250

- L.V.H. Rodgers, L.B. Hughes, M. Xie, P.C. Maurer, S. Kolkowitz, A.C. Bleszynski Jayich, and N.P. de Leon, "Materials challenges for quantum technologies based on color centers in

diamond," *MRS Bulletin*, **46**, 623-633 (2021).
https://link.springer.com/article/10.1557/s43577-021-00137-w

- B.F. Bachman, Z.R. Jones, G.R. Jaffe, J. Salman, R. Wambold, Z. Yu, J.T. Choy, S.J. Kolkowitz, M.A. Eriksson, M.A. Kats, and R.J. Hamers, "High-Density Covalent Grafting of Spin-Active Molecular Moieties to Diamond Surfaces," *Langmuir*, **37** (30), 9222-9231 (2021).
https://pubs.acs.org/doi/full/10.1021/acs.langmuir.1c01425

- J. Van Damme, X. Zheng, M. Saffman, M.G. Vavilov, and S. Kolkowitz, "Impacts of random filling on spin squeezing via Rydberg dressing in optical clocks," *PRA,* **103**, 023106 (2021).
https://journals.aps.org/pra/abstract/10.1103/PhysRevA.103.023106

- M.C. Cambria, A. Gardill, Y. Li, A. Norambuena, J.R. Maze, and S. Kolkowitz, "State-dependent phonon-limited spin relaxation of nitrogen-vacancy centers," *Physical Review Research,* **3**, 013123 (2021).
https://journals.aps.org/prresearch/abstract/10.1103/PhysRevResearch.3.013123

- R.A. Wambold, Z. Yu, Y. Xiao, B. Bachman, G. Jaffe, S. Kolkowitz, J.T. Choy, M. Eriksson, R.J. Hamers, and M.A. Kats, "Adjoint-optimized nanoscale light extractor for nitrogen-vacancy centers in diamond," *Nanophotonics,* **10**(1), 393-401 (2021).
https://www.degruyter.com/document/doi/10.1515/nanoph-2020-0387/html

- A. Gardill, M.C. Cambria, and S. Kolkowitz, "Fast relaxation on qutrit transitions of nitrogen-vacancy centers in nanodiamonds," *Physical Review Applied* **13**, 034010 (2020).
https://journals.aps.org/prapplied/abstract/10.1103/PhysRevApplied.13.034010

- E. Barausse, *et al.* (LISA Consortium), "Prospects for Fundamental Physics with LISA," *General Relativity and Gravitation,* **52**, 81 (2020).
https://link.springer.com/article/10.1007/s10714-020-02691-1

- M.A. Sedda, *et al.*, "The Missing Link in Gravitational-Wave Astronomy: Discoveries waiting in the decihertz range," *Classical & Quantum Gravity* **37**, 21 (2020).
https://doi.org/10.1088/1361-6382/abb5c1

- S. Kimmel and S. Kolkowitz, "No-go bounds for quantum seals," *Physical Review A* **100**, 052326 (2019). https://journals.aps.org/pra/abstract/10.1103/PhysRevA.100.052326

- S.L. Bromley, S. Kolkowitz, T. Bothwell, D. Kedar, A. Safavi-Naini, M.L. Wall, C. Salomon, A.M. Rey, and J. Ye, "Dynamics of interacting fermions under spin-orbit coupling in an optical lattice clock," *Nature Physics* **14**, 399-404 (2018).
https://www.nature.com/articles/s41567-017-0029-0

- S. Kolkowitz, S.L. Bromley, T. Bothwell, M.L. Wall, G.E. Marti, A.P. Koller, X. Zhang, A.M. Rey, and J. Ye, "Spin-orbit coupled fermions in an optical lattice clock," *Nature* **542**, 66-70 (2017). https://www.nature.com/articles/nature20811

- S. Kolkowitz, I. Pikovski, N. Langellier, M.D. Lukin, R.L. Walsworth, and J. Ye, "Gravitational wave detection with optical lattice atomic clocks," *Physical Review D* **94**, 124043 (2016).
https://journals.aps.org/prd/abstract/10.1103/PhysRevD.94.124043

- S. Kolkowitz, A. Safira, A.A. High, R.C. Devlin, S. Choi, Q.P. Unterreithmeier, D. Patterson, A.S. Zibrov, V.E. Manucharyan, H. Park, and M.D. Lukin, "Probing Johnson noise and ballistic transport in normal metals with a single spin qubit," *Science* **347**, no. 6226 (2015). https://www.science.org/doi/10.1126/science.aaa4298

- S. Kolkowitz, Q.P. Unterreithmeier, S.D. Bennett, and M.D. Lukin, "Sensing distant nuclear spins with a single electron spin." *Physical Review Letters*, **109**: 137601 (2015). https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.109.137601

- S. Kolkowitz, A.C.B. Jayich, Q.P. Unterreithmeier, S.D. Bennett, P. Rabl, J.G.E. Harris, and M.D. Lukin, "Coherent sensing of a mechanical resonator with a single-spin qubit," *Science* **335**, no. 6076 (2012). https://www.science.org/doi/10.1126/science.1216821

- S.D. Bennett, S. Kolkowitz, Q.P. Unterreithmeier, P. Rabl, A.C.B. Jayich, J.G.E. Harris, and M.D. Lukin, "Measuring mechanical motion with a single spin," *New Journal of Physics* **14**, 125004 (2012). https://iopscience.iop.org/article/10.1088/1367-2630/14/12/125004

- P. Rabl, S. Kolkowitz, F.H.L. Koppens, J.G.E. Harris, P. Zoller, and M.D. Lukin, "A quantum spin transducer based on nanoelectromechanical resonator arrays," *Nature Physics* **6**, 602-608 (2010). https://www.nature.com/articles/nphys1679

- P. Fierlinger, R. DeVoe, B. Flatt, G. Gratta, M. Green, S. Kolkowitz, F. Leport, M. Montero Diez, R. Neilson, K. O'Sullivan, A. Pocar, and J. Wodin, "A microfabricated sensor for thin dielectric layers," *Review of Scientific Instruments* **79**, 045101 (2008). https://aip.scitation.org/doi/10.1063/1.2906402

- D.S. Leonard, *et al.* (EXO Collab.), "Systematic study of trace radioactive impurities in candidate construction materials for EXO-200," *Nuclear Instruments and Methods in Physics Research Sect. A* **591**, 490 (2008). https://www.sciencedirect.com/science/article/abs/pii/S016890020800346X

- R. Abramitzky, L. Einav, S. Kolkowitz, and R. Mill, "On the optimality of line call challenges in professional tennis," *International Economic Review* **53**, 939-964 (2012). https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-2354.2012.00706.x

## Submitted pre-prints

- S. Ma, J. Dolde, X. Zheng, D. Ganapathy, A. Shtov, J. Chen, A. Stoeltzel, and S. Kolkowitz, "Enhancing optical lattice clock coherence times with erasure conversion," *arXiv:2505.06437* (2025). https://arxiv.org/abs/2505.06437

- J. Dolde, D. Ganapathy, X. Zheng, S. Ma, K. Beloy, and S. Kolkowitz, "Direct measurement of the $^3P_0$ clock state natural lifetime in $^{87}Sr$," *arXiv:2505.06440* (2025). https://arxiv.org/abs/2505.06440

- J. Rovny, S. Kolkowitz, and N.P. de Leon, "Multi-qubit nanoscale sensing with entanglement as a resource," *arXiv:2504.12533* (2025). https://arxiv.org/abs/2504.12533

- R. Vidrio, C. Saucedo, V. Lordi, S. Kolkowitz, K.G. Ray, R.J. Hamers, and J.T. Choy, "Sub-nanometer-thick native $sp^2$ carbon on oxidized diamond surfaces," *arXiv:2409.06934* (2024) https://arxiv.org/abs/2409.06934
- A. Sharma, S. Kolkowitz, and M. Saffman, "Analysis of a Cesium lattice optical clock," *arXiv:2203.08708* (2022). https://arxiv.org/abs/2203.08708

## Book chapters

- S. Kolkowitz and J. Ye, "Precision Timekeeping: Optical Atomic Clocks," pp. 139-156 in Handbook of Laser Technology & Applications, 2nd Ed., C. Guo, Ed., CRC Press, London (2021). (Invited) https://tinyurl.com/2p83dcvs

## Technical reports and white papers

- D. Antypas, et al. "New Horizons: Scalar and Vector Ultralight Dark Matter." *arXiv:2203.14915* (2022). https://arxiv.org/abs/2203.14915
- S. Kolkowitz, J.M. Hogan, I. Pikovski, J.K. Thompson, J. Ye, "Decadal Survey on Biological and Physical Sciences (BPS) Research in Space 2023-2032 - Topical: Gravitational wave detection with optical atomic clocks in space." (2021). https://tinyurl.com/4f3c6y56
- D. Carney, et al. "Snowmass 2021: Quantum Sensors for HEP Science–Interferometers, Mechanics, Traps, and Clocks." *arXiv:2203.07250* (2022). https://arxiv.org/abs/2203.07250
- Z. Ahmed, et al. "New Technologies for Discovery." *arXiv:1908.00194* (2019). https://arxiv.org/abs/1908.00194

## Patents

- S. Kolkowitz, A. Sharma, M. Saffman, "Alkali Metal Optical Clock." United States Patent Application #2023/0297033-A1, published 9/21/2023.
- S. Kolkowitz, M.C. Cambria, A. Gardill, "Super-Resolution Optical Microscope." United States Patent #11,733,537, published 8/22/2023.
- S. Kolkowitz, J. Thompson, "Efficient Quantum Error Correction in Neutral Atoms by Conversion to Erasure Errors." Provisional patent application filed with USPTO, January, 2022.
- S. Kolkowitz, A. Safira, A.A. High, R.C. Devlin, S. Choi, Q.P. Unterreithmeier, D. Patterson, A.S. Zibrov, V.E. Manucharyan, H. Park, M.D. Lukin, "A sensor for measurements using Johnson noise in materials." United States Patent #10,197,497, published 2/5/2019.

## Professional Activities

- UC Berkeley Department of Physics Vice Chair of Faculty Affairs, September, 2024 - present.
- Vice-Chair of the 2025 AMO Physics Gordon Research Conference
- Co-organizer of the 2024 ITAMP Workshop on Table-Top AMO for Fundamental Physics
- APS DAMOP 2024 Program Committee Member.
- Co-chair of the NASA Fundamental Physics Program Analysis Group (FunPAG) Technology working subgroup.
- Member of the NASA Executive Committee of the Fundamental Physics Program Analysis Group (FunPAG).
- Completed the Teaching Excellence Colloquium for new Berkeley faculty during the 2023-24 Academic Year.
- Co-founder and organizing board member for the Virtual AMO Seminar (VAMOS) series.
- Member of the 2023 National Academy of Sciences Panel on Review of the National Institute of Standards and Technology's Physical Measurements Laboratory.
- Education, Workforce Development, and Outreach Major Activities Lead for Hybrid Quantum Architectures and Networks NSF QLCI Institute, 2020-2023.
- Panelist and research proposal reviewer for US National Science Foundation, US Department of Energy, US Army Research Office, Israel Science Foundation, U.S.–Israel Binational Science Foundation, Research Corporation for Science Advancement, National Research Foundation of Singapore, German Research Foundation (DFG) and NWO Domain Science.
- Referee for journals including *Physical Review Letters, Physical Review X, Physical Review X Quantum, Physical Review A, Physical Review B, Physical Review Applied, New Journal of Physics, Journal of Optics, Nature Communications, Nature Physics, npj Quantum, Review of Scientific Instruments, Communications Chemistry, Journal of Micromechanics and Microengineering,* and *Nano Letters.*
- Madison Teaching and Learning Excellence Fellow.

## Research funding

- PI on current and former grants from ARO, AFOSR, DOE, David and Lucile Packard Foundation, John Templeton Foundation, Moore Foundation, Noyce Foundation, NASA, National Science Foundation, NIST, Northwestern Center for Fundamental Physics, Simons Foundation, Sloan Foundation, and other funding agencies.

## Invited talks

- Joint Quantum Institute Seminar, College Park, MD - May 12th, 2025
- 2025 MRS April Meeting, Seattle, WA - April 9th, 2025
- University of California, Davis Physics Colloquium, Davis, CA - March 31st, 2025
- QDiamond 2025, Budapest, Hungary - Feb. 25th, 2025
- Institute of Navigation Precise Time and Time Interval Systems and Applications (PTTI) Tutorial, Long Beach, CA - Jan. 27th, 2025
- PQE 2025, Snowbird, UT - Jan. 9th, 2025
- Max Planck Quantum Institute (MPQ) Colloquium, Munich, Germany - Dec. 17th, 2024
- Physikalisch-Technische Bundesanstalt (PTB)/University of Hannover DQ-mat Colloquium, Braunschweig, Germany - Dec. 12th, 2024
- Cal State Easy Bay Spitzer Seminar, Hayward, CA - Dec. 6th, 2024
- Berkeley Sensor & Actuator Center (BSAC) Seminar, Berkeley, CA - Nov. 19th, 2024
- 2024 KLA Engineering Conference, Monterey, CA - Oct. 15th, 2024
- Japan-US Joint Seminar on Quantum Electronics & Laser Spectroscopy, Stanford, CA - Sep. 25th, 2024
- Packard Fellow Meeting - Graduating Fellow Presentation - Sep. 5th, 2024
- Quantum Science Gordon Research Conference, Easton, MA - Aug. 1st, 2024
- Cold Atoms and Molecules for Fundamental Physics - ICAP Satellite Workshop, Cambridge, England - July 23rd, 2024
- European Frequency and Time Forum, Neuchâtel, Switzerland - June 27th, 2024
- Keynote Speaker, Ultrafast Dynamics & Ultrafast Bandgap Photonics - Quantum Sensing and Control, Hersonissos, Crete, Greece - June 17th, 2024
- NASA Fundamental Physics Workshop, San Diego, CA - May 15th, 2024
- Physics colloquium, Colorado State University, Fort Colllins, CO - March 25th, 2024
- Featured Speaker, Nebraska Research and Innovation Conference, Lincoln, NE - March 14th, 2024
- Physics colloquium, Naval Postgraduate School, Monterey, CA - Feb. 16th, 2024
- CIQC Quantum Spark Talk, UC Berkeley, CA - Feb. 2nd, 2024
- PQE 2024, Snowbird, UT - Jan. 8th, 2024

- Physics colloquium, UC Berkeley, CA - Nov. 16th, 2023
- ARO Physics Review meeting, (virtual) - Nov. 1st, 2023
- Princeton Quantum Technology Conference, Princeton, NJ - October 17th, 2023
- KITP workshop: Frontiers of Quantum Metrology: Fundamental Physics, Unexpected Connections, and Novel Applications, Santa Barbara, CA - October 9th, 2023
- 31st Annual International Laser Physics Workshop, (virtual) - July 3rd, 2023
- AMO Physics Gordon Research Conference, Newport, RI - June 13th, 2023
- CLEO 2023, San Jose, CA - May 10th, 2023
- Q-FARM Seminar, Stanford University, CA - March 15th, 2023
- APS March Meeting, Las Vegas, NV - March 7th, 2023
- Physics colloquium, EPFL, Lausanne, Switzerland - Feb. 20th, 2023
- SPIE Photonics West, San Francisco, CA - Jan. 28th, 2023
- PQE 2023, Snowbird, UT - Jan. 9th, 2023
- Center for Ultracold Atoms Seminar, MIT - Oct. 18th, 2022
- Physics colloquium, Harvard University - Oct. 17th, 2022
- Texas A&M Condensed Matter Seminar, College Station, TX - September 23rd, 2022
- ICAP 2022, Toronta, Canada - July 20th, 2022
- Ultrafast Dynamics and Metastability VII, Hersonissos, Crete, Greece - June 8th, 2022
- DAMOP 2022, Orlando, FL - June 1st, 2022
- NSLS-II CFN Joint Users' Meeting Workshop, (virtual) - May 26th, 2022
- Quantum Matter Seminar, Caltech, CA - April 1st, 2022
- Special Seminar, UC Santa Barbara, CA - March 11th, 2022
- AMO Seminar, UC Berkeley, CA - Feb. 14th, 2022
- SPIE Photonics West On-Demand, (virtual) - February, 2022
- PQE 2022, (virtual) - Jan. 10th, 2022
- DOE BES Theoretical Condensed Matter Physics PI Meeting, (virtual) - Nov. 26th, 2021
- Workshop on Q-NEXT characterization needs for Argonne Scientific User Facilities, (virtual) - Sep. 30th, 2021

- Community Workshop on Cold Atoms in Space (CERN Quantum Technology Initiative), (virtual) - Sep. 23rd, 2021
- OSA Optical Sensors and Sensing Congress, (virtual) - July 21st, 2021
- MRS Bulletin Webinar, "Materials Science for Quantum Computing," (virtual) - July 14th, 2021
- SPIE Photonics West, (virtual) - March, 2021
- ARO Physics Review meeting, (virtual) - April 14th, 2021
- Physics colloquium (virtual), North Carolina State - Oct. 19th, 2020
- Packard Fellow Meeting - Virtual New Fellow Presentation - Sep. 20th, 2020
- CQE Research Briefing - Virtual seminar - May. 21st, 2020
- SPIE Photonics West, San Francisco, CA - Feb. 2nd, 2020
- ARO Atomic and Molecular Physics Review meeting, Durham, NC - Jan. 30th, 2020
- PQE 2020, Snowbird, UT - Jan. 10th, 2020
- ITAMP Workshop: "Laboratory Cosmology: AMO Physics Techniques and Applications," Harvard, MA - Sep. 16th, 2019
- Gordon and Betty Moore Foundation Lecture, Stevens Institute of Technology, NJ - July 10th, 2019
- Engineering Physics Seminar, University of Wisconsin-Madison, WI - May. 7th, 2019
- Physical Chemistry Seminar, University of Wisconsin-Madison, WI - March. 5th, 2019
- Physics colloquium, Lawrence University, WI - Feb. 19th, 2019
- SPIE Photonics West, San Francisco, CA - Feb. 6th, 2019
- CPAD Instrumentation Frontier Workshop 2018, Brown University, RI - Dec. 9th, 2018
- Midwest Cold Atom Workshop, University of Illinois Urbana-Champaign, IL - Nov. 10th, 2018
- Chaos and Complex Systems Seminar, University of Wisconsin-Madison, WI - Sep. 11th, 2018
- AMO/QI seminar, University of Illinois Urbana-Champaign, IL - Mar. 28th, 2018
- Physics Department colloquium, University of Wisconsin-Madison, WI - Feb. 23rd, 2018
- SRitp workshop: "Beyond Standard Model Physics in direct, indirect and tabletop experiments," Weizmann Institute, Israel - Nov. 13th, 2017
- AMO seminar, UC Berkeley, CA - Oct. 4th, 2017
- College of Optical Sciences colloquium, University of Arizona, AZ - Feb. 2nd, 2017

- Atomic Physics Seminar, University of Wisconsin-Madison, WI - Jan. 24th, 2017
- Special Physics colloquium, UC Santa Barbara, CA - Jan. 5th, 2017
- CNAM colloquium, University of Maryland, MD - Oct. 6th, 2016
- ITAMP workshop: "Laboratory Cosmology: AMO Physics Techniques and Applications for Cosmological Phenomena," Harvard, MA - Sep. 12th, 2016
- NASA Fundamental Physics workshop, Dana Point, CA - Apr. 11th, 2016
- ITAMP weekly seminar, Harvard, MA - Mar. 31st, 2016
- Winter school workshop: "Advanced atomic sources and extreme cooling of atoms and molecules: techniques and applications," Les Houches, France - Jan. 27th, 2016
- Condensed Matter and Biophysics seminar, Washington University in St. Louis, MO - Dec. 1st, 2014
- AMO seminar, UC Berkeley, CA - Nov. 25th, 2014
- Boston Area Carbon Nanoscience seminar, MIT, MA - Oct. 24th, 2014
- Atomic, Bio, and Condensed Matter seminar, University of Washington, WA - Oct. 16th, 2014
- Center for Ultracold Atoms triple feature seminar, Harvard-MIT, MA - Sep. 30th, 2014
- California NanoSystems Institute seminar, UC Santa Barbara, CA - June 1st, 2012
- ITAMP workshop: "Optomechanics and Macroscopic Cooling," Harvard, MA - Feb. 7th, 2011
- Condensed Matter special seminar, Weizmann Institute, Israel - Jan. 31st, 2011

## Public outreach lectures

- Teens Take The Magnes, Magnes Collection of Jewish Art and Life, CA - March 3rd, 2024
- Compass Lecture, UC Berkeley, CA - Oct. 27th, 2023
- Space Place Public Lecture, University of Wisconsin - Madison, WI - March 8th, 2022
- Industrial Internet Consortium Member Meeting Keynote speaker, (virtual) - June, 2021
- Madison Astronomical Society Talk, Virtual - Aug. 14th, 2020
- Business Engagement Day on Campus RED Talk, University of Wisconsin - Madison, WI - Aug. 15th, 2019
- Science on Tap public talk, Madison, WI - May 1st, 2019
- Science Hall colloquium, Lawrence University, WI - Feb. 18th, 2019
- Madison Technical Club lecture, Madison, WI - Feb. 13th

- Technology Advisors Circle seminar, Benhamou Global Ventures, Palo Alto, CA - Feb. 5th, 2019
- Contributed talk, "Color: Pixels, Palettes, and Perception Symposium," University of Wisconsin - Madison, WI - Mar. 3rd, 2018

## Courses taught:

- (UC Berkeley) C191: Introduction to Quantum Computing (Spring 2024)
- (UC Berkeley) Physics 5A: Introductory Mechanics and Relativity (Fall 2023)
- (UW-Madison) Physics 779: Advanced Quantum Computing (Spring 2020, Spring 2021, Spring 2022, Spring 2023)
- (UW-Madison) Physics 545: Introduction to Atomic Structure (Fall 2020, Fall 2021, Fall 2022)
- (UW-Madison) Physics 707: Quantum Computing Laboratory (Summer 2020)
- (UW-Madison) Physics 625: Applied Optics (Fall 2018, Fall 2019)
- (UW-Madison) Physics 325: Wave Motion and Optics (Spring 2018)