Daniel Ang

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Positions

2023-present	**Quantum Technology Center Scientist**, Walsworth Group, Quantum Technology Center, University of Maryland
2018-23	**Visiting Pre-Doctoral Fellow in Physics** , Gabrielse Lab, Center for Fundamental Physics, Northwestern University
2020	**Teaching Fellow, Applied Physics 50A**, Department of Physics (under Eric Mazur), Harvard University
2015-23	**Graduate Research Assistant**, Gabrielse Lab & ACME collaboration, Department of Physics, Harvard University
2013	**Visiting Undergraduate Fellow in Physics**, ACME Collaboration, Harvard University
2012-15	**Research Assistant**, Hunter Lab, Amherst College

Education

Harvard University *Cambridge, MA*

PhD, Physics *2023*

- Member, ACME collaboration
- Dissertation: *Progress towards an Improved Measurement of the Electron Electric Dipole Moment*
- PhD committee: Gerald Gabrielse (main advisor), Roxanne Guenette, Isaac Silvera, Ronald Walsworth

Harvard University *Cambridge, MA*

MA, Physics *2017*

Amherst College *Amherst, MA*

BA with Honors, Mathematics, Music, Physics *2015*

- Summa cum laude with Distinction
- Senior thesis in physics: *In Search of New Geometries for Probing Spin-Spin Interactions* (advisor: Larry Hunter)
- Senior thesis in music: *In Pursuit of Feeling* (advisor: Eric Sawyer)

Publications

* denotes equal contribution.

Journal articles

12. R.A. Escalante*, A. Beling*, **D. G. Ang**, N. Reed, J. Welter, J. Blanchard, C. Campos, E. Coronel, K. Krambrock, A.S. Leal, P.N. Prasad, R.L. Walsworth, "Direct Measurement of the Singlet Lifetime and Photoexcitation Behavior of the Boron Vacancy Center in Hexagonal Boron Nitride," *Advanced Optical Materials*, e71351 (2026).
11. **D. G. Ang***, J. Tang*, R.L. Walsworth, "Design of a quantum diamond microscope with efficient scanning confocal readout," *Academia Quantum* 2(2) (2025).
10. T. Masuda, A. Hiramoto, **D.G. Ang**, C. Meisenhelder, C. D. Panda, N. Sasao, S. Uetake, X. Wu, D. P. DeMille, J. M. Doyle, G. Gabrielse, K. Yoshimura, "High-sensitivity low-noise photodetector using large-area silicon photomultiplier," *Optics Express* **31**(2), 1943–1957 (2023).
9. **D.G. Ang**, C. Meisenhelder, C. Panda, X. Wu, D. DeMille, J. Doyle, G. Gabrielse, "Measurement of the $H^3\Delta_1$ Radiative Lifetime in ThO," *Physical Review A* **106**, 022808 (2022).
8. X. Wu, P. Hu, Z. Han, **D.G. Ang**, C. Meisenhelder, G. Gabrielse, J.M. Doyle, D. DeMille, "Electrostatic focusing of cold and heavy molecules for the ACME electron EDM search," *New Journal of Physics* **24**, 073043 (2022).
7. T. Masuda, **D.G. Ang**, N. R. Hutzler, C. Meisenhelder, N. Sasao, S. Uetake, X. Wu, D. DeMille, G. Gabrielse, J.M. Doyle, K. Yoshimura, "Suppression of the optical crosstalk in a multi-channel silicon photomultiplier array," *Optics Express* **29**(11), 16914–16926 (2021).

6. X. Wu, Z. Han, J. Chow, **D.G. Ang**, C. Meisenhelder, C.D. Panda, E. West, G. Gabrielse, J.M. Doyle, D. DeMille, "The metastable Q $^3\Delta_2$ state of ThO: A new resource for the ACME electron EDM search," *New Journal of Physics* **22**, 023013 (2020).
5. C.D. Panda, C. Meisenhelder, M. Verma, **D.G. Ang**, J. Chow, Z. Lasner, X. Wu, D. DeMille, J.M. Doyle, G. Gabrielse, "Attaining the shot-noise-limit in the ACME measurement of the electron electric dipole moment," *Journal of Physics B* **52**, 235003 (2019).
4. The ACME Collaboration: V. Andreev, **D.G. Ang**, D. DeMille, J.M. Doyle, J. Haefner, N.R. Hutzler, Z. Lasner, C. Meisenhelder, B.R. O'Leary, C.D. Panda, A.D. West, E.P. West, X. Wu, "Improved limit on the electric dipole moment of the electron," *Nature* **562**, 355–360 (2018).
3. S.K. Peck, N. Lane, **D.G. Ang**, and L.R. Hunter, "Using Tensor Light Shifts to Measure and Cancel a Cell's Quadrupolar Frequency Shift," *Physical Review A* **93**, 023426 (2016).
2. L.R. Hunter, **D.G. Ang**, "Using Geoelectrons to Search for Velocity-Dependent Spin-Spin Interactions," *Physical Review Letters* **112**, 091803 (2014).
1. L.R. Hunter, J. Gordon, S. Peck, **D. Ang**, and J.-F. Lin, "Using the Earth as a polarized electron source to search for long-range spin-spin interactions," *Science* **339**, 928 (2013).

Conference Proceedings

4. **D.G. Ang**, J.S. Tang, M. Shen, M. Camp, A. Gilpin, G. Liyanage, R. Walsworth, "Progress towards a solid-state directional dark matter detector," in S. Hirose, P. Stengel, et al., *Mineral Detection of Neutrinos and Dark Matter 2025 Proceedings*, arXiv:2508.20482 (2025).
3. **D.G. Ang**, X.X. Liu, J.S. Tang, M. Shen, R. Ebadi, R. Walsworth, "Progress towards a solid-state directional dark matter detector," in S. Baum, P. Huber, P. Stengel, et al., *Mineral Detection of Neutrinos and Dark Matter 2024 Proceedings*, arXiv:2405.01626 (2024).
2. A. Hiramoto, T. Masuda, **D.G. Ang**, C. Meisenhelder, C. Panda, N. Sasao, S. Uetake, X. Wu, D. DeMille, J.M. Doyle, G. Gabrielse, K. Yoshimura, "SiPM module for the ACME III electron EDM search," *Nuclear Instruments and Methods in Physics Research* A **1045**, 167513 (2023).
1. L.R. Hunter, S.K. Peck, **D.G. Ang**, D.K. Kim, D. Stein, D. Orbaker, A. Foss, M.T. Hummon, J.E. Gordon, J.F. Lin, "Bounds on LLI violation and long-range spin-spin interactions using Hg, Cs, and the earth," *Proceedings of the 6th Meeting on CPT and Lorentz Symmetry, CPT 2013* (2014).

Colloquia and Seminars

"From recoils to readout: recent progress and open questions in diamond-based mineral detection"
MDDM collaboration annual meeting, University of Michigan, Ann Arbor, MI, May 20, 2026 **(invited talk)**

"Directional Dark Matter Detection and Beyond: Diamond as a Platform for Mineral Detectors"
Mineral Detection of Neutrinos and Dark Matter Meeting 2026, Karlsruhe, Germany, April 14, 2026 **(invited talk)**

"Progress in Directional Dark Matter Detection Using Nitrogen Vacancy Centers in Diamond"
Center for Neutrino Physics Seminar, Virginia Tech, Blacksburg, VA, November 5, 2025 **(invited talk)**

"Progress in Directional Dark Matter Detection Using Nitrogen Vacancy Centers in Diamond"
HEP - Astro Seminar, University of Michigan, Ann Arbor, MI, September 8, 2025 **(invited talk)**

"Towards Quantum Sensing for Directional Dark Matter Detection Using Nitrogen Vacancy Centers in Diamond"
Mineral Detection of Neutrinos and Dark Matter Meeting 2025, Yokohama, Japan, May 20, 2025 **(invited talk)**

"Towards Quantum Sensing for Directional Dark Matter Detection Using Nitrogen-Vacancy Centers in Diamond"
APS Global Physics Summit, Anaheim, CA, March 18, 2025

"Quantum Sensing with Diamond Defects: From Navigation to Dark Matter Detection"
Naval Surface Warfare Center - Carderock Division, Carderock, MD, October 31, 2024 **(invited talk)**

"Progress in directional DM detection with quantum diamond sensors"
Mineral Detection of Neutrinos and Dark Matter Meeting 2024, Arlington, VA, January 9, 2024

"Progress in directional DM detection with quantum diamond sensors"
8th CYGNUS Workshop on Directional Recoil Detection, Sydney, Australia, December 14, 2023

"ACME EDM: Probing TeV-Scale New Physics in a Tabletop Experiment"
Naval Research Laboratory **(invited talk)**, Washington, DC, July 20, 2023

"ACME EDM: Probing TeV-Scale New Physics in a Tabletop Experiment"
MIT LNS Lunchtime seminar **(invited talk)**, Cambridge, MA, May 16, 2023

"Progress in the ACME III Search for the Electron EDM"
53rd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Orlando, FL, June 1, 2022

"A New Lifetime Measurement of the $H^3\Delta_1$ state of Thorium Monoxide for the ACME electron EDM experiment"
52nd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (virtual), June 2, 2021

"New H-state lifetime measurement for the ACME electron EDM search"
51st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (virtual), June 3, 2020

"Beyond the ACME II Limit on the Electron EDM"
Gordon Research Conference (Atomic Physics) on Cold Controlled Atoms and Molecules, Ultrafast Spectroscopy and Precision Measurements, Newport, RI, June 9-14, 2019 (poster)

"Characterization and Suppression of Systematic Errors in the ACME II Measurement of the Electron Electric Dipole Moment"
49th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics APS Meeting, Ft. Lauderdale, FL, May 28 - June 1, 2018 (poster)

"Progress Towards an Order of Magnitude Improvement on the Measurement of the Electron Electric Dipole Moment"
48th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Sacramento, CA, June 5-9, 2017 (poster)

Research Grants

2025-present	**Solid-State Quantum Sensors: Investigation and Optimization for DoD-Relevant Applications**, Army Research Office, Quantum Technology Center, UMD | *Senior Personnel (PI: Ronald Walsworth)*	*$3.1 million*
2026	**I-Corps: NVantage - Quantum Sensors for Diamond Tool Condition Monitoring**, National Science Foundation, Quantum Technology Center, UMD | *Principal Investigator*	*$50,000*

Awards & Fellowships

2025-26	**Wheaton Fellowship**, Wheaton College	
2023-24	**Veritas Scholars Program**, Veritas Forum	
2019-22	**Harvey Fellowship**, Mustard Seed Foundation	*$ 48,000*
2015-18	**Rufus B. Kellogg Amherst Graduate Fellowship**, Amherst College	*$ 90,000*
2015	**Joint Quantum Institute Graduate Fellowship (declined)**, University of Maryland	
	Stifler Prize in physics, Amherst College	
	Sundquist Prize in music composition and performance, Amherst College	
	Elected to Phi Beta Kappa, Amherst College	
	Elected to Sigma Xi, Amherst College	
2014	**Winner, Third Degree (National category) and Honorary Mention (International category)**, Golden Key Festival Piano Composition Competition, Vienna, Austria	
	Finalist, ASCAP Morton Gould Young Composers' Awards	
2012	**Schupf Scholarship**, Amherst College	*$ 25,000*
	Bassett Prize in physics, Amherst College	
2011-15	**International Student Scholarship**, Amherst College	
2007-10	**School-Based Scholarship, Anglo-Chinese School (Independent)**, Ministry of Education, Singapore	

Teaching Experience

Fall 2020	**Physics as a Foundation for Science and Engineering, Part I**, Teaching Fellow (under Eric Mazur)	*Harvard University*
Fall 2012	**Introductory Physics I: Mechanics**, Grader	*Amherst College*
Spring 2012	**Introductory Physics I: Mechanics**, Teaching Assistant & Grader	*Amherst College*

Mentoring

2023-current	**Leader**, directional dark matter detection subgroup, Walsworth group, University of Maryland
2023-26	**Richard Escalante**, Postdoc, University of Maryland
2023-current	**Andrew Beling, Xingxin Liu, Smriti Bhalerao, Niko Reed, Maximilian Shen, Jiashen Tang, Jiarui Yu, Mason Camp, Gavishta Liyanage**, Graduate research assistants, University of Maryland
2023-current	**Andrew Gilpin, Priyanshu Bhattacharya, Chinmay Bharatulwar, Anson Cook, Jordan Giandrea**, Undergraduate research assistants, University of Maryland
2024	**Dakota Pippins**, High school research assistant, Montgomery Blair High School
2022	**Maya Watts, Collin Diver, John Mitchell**, Graduate research assistants, Northwestern University
2015-2023	**Paules Zakhary, Siyuan Liu, Elizabeth Choi, Piroz Bahar**, Undergraduate research assistants, Harvard University

Professional Service

Manuscript reviewer for journals including *Nature Electronics*, *Nature Communications*, and *EPJ Quantum Technology*.

Extracurricular Activities

2018-19	**Philosophy of Science Discussion Group**, Organizer	*Harvard University*
2016-18	**Dudley World Music Ensemble, Dudley House**, Music Director & Dudley Fellow	*Harvard University*
2011-15	**Amherst College Symphony Orchestra**, Principal Cellist	*Amherst College*

Certified accurate and complete.

Daniel G. Ang

Date: June 14, 2026