

DANIEL GORDON ANG

Gabrielse Lab
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RESEARCH INTERESTS

Electric dipole moments, tabletop searches for new physics, precision measurements and fundamental constants

EDUCATION

Doctor of Philosophy in Physics Expected 2022
Harvard University, Cambridge, MA
Passed PhD qualifying examinations (January 2018).
Focus on precision measurements using atomic, molecular and optical physics techniques.
Dissertation committee: Gerald Gabrielse (main adviser), Ronald Walsworth, Roxanne Guenette.

Master of Arts in Physics May 2017
Harvard University, Cambridge, MA

Bachelor of Arts *summa cum laude* with Distinction May 2015
Amherst College, Amherst, MA
Majors: Mathematics, Music, Physics
Double senior honors theses in Music (*summa cum laude*) and Physics (*magna cum laude*)
Phi Beta Kappa, Sigma Xi

International Baccalaureate Diploma February 2011
Anglo-Chinese School (Independent), Singapore
43/45 points (97% percentile worldwide)
Music Extended Essay selected for official IBO publication *50 More Excellent Extended Essays*

PROFESSIONAL POSITIONS

Northwestern University, Evanston, IL October 2018-present
Visiting Pre-Doctoral Fellow in Physics (Gabrielse Group)

Harvard University, Cambridge, MA September 2015-present
Graduate student researcher, ACME Collaboration
Adviser: Gerald Gabrielse in collaboration with John Doyle, David DeMille

Amherst College, Amherst, MA May 2014-May 2015
Senior thesis researcher, spin-spin interactions experiment, Hunter Lab
Adviser: Larry Hunter

Harvard University, Cambridge, MA Summer 2013
Visiting Undergraduate Fellow in Physics, ACME Collaboration
Adviser: David DeMille

Amherst College, Amherst, MA Summer 2012-Spring 2013
Summer research fellow, spin-spin interactions experiment, Hunter Lab
Adviser: Larry Hunter

TEACHING EXPERIENCE

Harvard University, Teaching Fellow (with Prof. Eric Mazur) Fall 2020
APPHY 50A: Physics as a Foundation for Science and Engineering, Part I

Amherst College, grader Fall 2012
PHYS-116 Introductory Physics I: Mechanics

Amherst College, Physics Teaching Assistant & Grader Spring 2012
PHYS-116 Introductory Physics I: Mechanics

MENTORING EXPERIENCE

- September 2018-May 2019 - Piroz Bahar (undergraduate)
- Summer 2018 - Elizabeth Choi (high school student)
- Summer 2017 - Paules Zakhary, Siyuan Liu (undergraduate)

MISCELLANEOUS PROFESSIONAL EXPERIENCE

Harvard University, Cambridge, MA September 2016-May 2018
Dudley Fellow and Music Director, World Music Ensemble

IT Supervisor/Specialist September 2011-May 2015
Amherst College IT Department, Amherst, MA

PUBLICATIONS

Journal articles:

1. 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).
2. 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).
3. 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).
5. 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).
6. L.R. Hunter, **D.G. Ang**, "Using Geoelectrons to Search for Velocity-Dependent Spin-Spin Interactions," *Physical Review Letters* **112**, 091803 (2014).
7. 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 and other publications:

1. L.R. Hunter, S.K. Peck, **D. 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," *CPT and Lorentz Symmetry - Proceedings of the Sixth Meeting*. Edited by Alan Kostelecky. World Scientific Publishing Co. Pte. Ltd., 2014, pp. 1-4
2. **D.G. Ang**, "Shape and Size Matter for Projectile Drag," *Journal of the Advanced Undergraduate Physics Laboratory Investigation: Vol. 1: Iss. 1, Article 2* (2013).

CONFERENCE PRESENTATIONS

1. "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 (oral presentation)

2. “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)
3. “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)
4. “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)

HONORS AND AWARDS

- Harvey Fellowship, Mustard Seed Foundation, \$48,000 (2019-22)
- Rufus B. Kellogg Amherst Graduate Fellowship, \$90,000 (2015-18)
- Joint Quantum Institute Graduate Fellowship, University of Maryland (declined)
- Stifler Prize in physics, Amherst College (2015)
- Sundquist Prize in music composition and performance, Amherst College (2015)
- Winner, Third Degree (National category) and Honorary Mention (International category), Golden Key Festival Piano Composition Competition, Vienna, Austria (2014)
- Finalist in ASCAP Morton Gould Young Composers’ Awards (2014)
- Schupf Scholarship (2012-15): \$25,000 for independent research and projects
- Bassett Prize in physics, Amherst College (2012)
- Amherst College International Student Scholarship (2011-15)
- Singapore Ministry of Education School-Based Scholarship (2007-10)

Media articles

- “When One—or Two—Isn’t Enough: Triple Majors Balance Academics, Ambition and Time”, Elaine Jeon, Amherst College News, July 2015.
- “One-Man Orchestra Composes His Own Path”, Jingwen Zhang, Amherst *Student*, May 2015.
- “Playing Where Brahms Once Played”, William Sweet, *Amherst* magazine, August 2014.

LANGUAGES

English, Indonesian (fluent), Malay (advanced).

ORGANIZATIONS

- American Physical Society (2011-present)
- Society of Physics Students (2011-2015)

EXTRACURRICULAR ACTIVITIES

- Member, Trinity Cambridge Church Music Ministry (2018-present). Music Ministry Leader (2019-present).
- Member of leadership committee, Harvard Graduate Christian Fellowship (2017-19).
- Musician, Dudley World Music Ensemble (2015-present). Dudley Fellow and Music Director (2016-18).
- Participant and presenter, Harvard Philosophy of Science Club (2016-2019). Main organizer (2018-19).
- Cellist, Park Street Church and Restore Christian Church Quincy (2015-18)
- Cellist, Mather Chamber Music Program (2015-16, 2017)

Undergraduate activities:

- Cellist, Five College Early Music Program (2015)
- Cellist, Amherst College Jazz Combo Program (2013-15)

- Cellist, Harvard-Radcliffe MIHNUET program (summer 2013)
- Cellist and pianist, First Baptist Church of Amherst (2011-15)
- Cellist, Buckley Boys String Quartet, Amherst College Chamber Music Program (2011-15)
- Principal Cellist, Amherst College Symphony Orchestra (2011-15)