Allen David Boozer

Department of Mathematics
Princeton University
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EDUCATION

University of California, Los Angeles
PhD in Mathematics (Advisor: Ciprian Manolescu) 2020

- Dissertation Year Fellowship
- Departmental Teaching Assistant Award
- Barrett O'Neill Travel Award

California Institute of Technology
PhD in Physics 2005

- Special Institute Fellowship

University of Virginia
BS with Highest Distinction in Mathematics and Physics 1996

- McShane Prize (awarded to top math major in graduating class)
- James W. Elkins Award (awarded to top physics major in graduating class)
- Edwin E. Floyd Prize in Mathematics
- Departmental Recognition in Physics
- Echols Scholarship
- Barry M. Goldwater Scholarship
- Phi Beta Kappa

TEACHING EXPERIENCE

Princeton University 2020–
Instructor, Department of Mathematics

- MAT 103: Calculus I

University of California, Los Angeles 2014–2019
Teaching Assistant, Department of Mathematics, average evaluation score 8.2/9

- Math 31A: Differential and Integral Calculus
- Math 31B: Integration and Infinite Series
- Math 32A: Calculus of Several Variables (Differential)
- Math 32B: Calculus of Several Variables (Integral)
- Math 32BH: Calculus of Several Variables (Integral, Honors)

California Institute of Technology 1997–1999, 2010
Teaching Assistant, Department of Physics

EMPLOYMENT

Princeton University 2020–
Instructor, Department of Mathematics

University of New Mexico 2010–2011
Post-doctoral scholar, Quantum Information and Control group

California Institute of Technology 2006–2009
Staff scientist, Quantum Optics group

California Institute of Technology 2005–2006
Post-doctoral scholar, Quantum Optics group

PROFESSIONAL SERVICE

Referee for journals

- Physical Review Letters
- Physical Review A
- Journal of Physics A: Mathematical and Theoretical
- American Journal of Physics

INVITED TALKS

1. Princeton University, April 2020.
2. Stanford University, February 2020.
3. University of Oregon, January 2020.
4. Massachusetts Institute of Technology, December 2019.
5. Columbia University, November 2019.
6. Michigan State University, September 2019.
7. Park City Mathematics Institute, July 2019.
8. Rutgers University, July 2018.

PUBLISHED AND SUBMITTED MANUSCRIPTS (MATHEMATICS)

1. David Boozer, "The moduli space of stable rank 2 parabolic bundles over an elliptic curve with 3 marked points," **arXiv:2007.02524**.
2. David Boozer, "Computer bounds for Kronheimer-Mrowka foam evaluation," to appear in Experimental Mathematics, **arXiv:1908.07133**.
3. David Boozer, "Holonomy perturbations of the Chern-Simons functional for lens spaces," [submitted] **arXiv:1811.01536**.
4. David Boozer, "Moduli spaces of Hecke modifications for rational and elliptic curves," to appear in Algebraic & Geometric Topology, **arXiv:1805.11184**.

PUBLISHED AND SUBMITTED MANUSCRIPTS (PHYSICS)

1. David Boozer, "Classical Field Theory", Book Review, *Am. J. Phys.* **86** 398 (2018).
2. A. D. Boozer, "Thermodynamic time asymmetry and the Boltzmann equation," *Am. J. Phys.* **83** 223 (2015).
3. A. D. Boozer, "Time-reversal invariance and time asymmetry in classical electrodynamics," *Am. J. Phys.* **81** 585 (2013).
4. A. D. Boozer, "Time-optimal synthesis of $SU(2)$ transformations for a spin-1/2 system," *Phys. Rev. A* **85** 012317 (2012).
5. A. D. Boozer, "Dynamical symmetries in classical mechanics," *Eur. J. Phys.* **33** 73–83 (2012). [in top 3% of downloads for that quarter across all IOP journals]
6. A. D. Boozer, "Boltzmann equations for a binary one-dimensional ideal gas," *Phys. Rev. E* **84** 031127 (2011).
7. A. D. Boozer, "Nordström gravity in $(1+1)$ dimensions coupled to matter," *Phys. Rev. D* **84** 024035 (2011).
8. A. D. Boozer, "Boltzmann's H-theorem and the assumption of molecular chaos," *Eur. J. Phys.* **32** 1391–1403 (2011).
9. A. D. Boozer, "Classical Yang-Mills theory," *Am. J. Phys.* **79** (9) 925–931 (2011).
10. A. D. Boozer, "Periodic lattices in Minkowski space," *Am. J. Phys.* **78** (12) 1379–1383 (2010).
11. A. D. Boozer, "Nordström gravity coupled to point particles in $(1+1)$ dimensions," *Phys. Rev. D* **81** 064022 (2010).

12. A. D. Boozer, "The role of spatial topology in a toy model of classical electrodynamics in $(1+1)$ dimensions," *Phys. Lett. A* **374** 1901–1908 (2010).
13. A. D. Boozer, "Simulating a one-dimensional plasma," *Am. J. Phys.* **78** (6) 580–584 (2010).
14. A. D. Boozer, "The momentum distribution of a one-dimensional ideal gas of N atoms." *Am. J. Phys.* **78** (1) 20–23 (2010).
15. A. D. Boozer, "Simulating a toy model of electrodynamics in (1+1) dimensions," *Am. J. Phys.* **77** (3) 262–269 (2009).
16. A. D. Boozer, "Hidden variable theories and quantum nonlocality," *Eur. J. Phys.* **30** 355–365 (2009). [in top 10% of downloads for that quarter across all IOP journals]
17. A. D. Boozer, "Laserlike and atomlike regimes in a one-atom laser," *Phys. Rev. A* **78** 053814 (2008).
18. A. D. Boozer, "Time asymmetry in a dynamical model of the one-dimensional ideal gas," *Am. J. Phys.* **76** (11) 1026–1030 (2008).
19. A. D. Boozer, "Advanced action in classical electrodynamics," *J. Phys. A: Math. Theor.* **41** 425202 (2008).
20. A. D. Boozer, "Theory of Raman transitions in cavity QED," *Phys. Rev. A* **78** 033406 (2008).
21. A. D. Boozer, "A toy model of quantum electrodynamics in (1+1) dimensions," *Eur. J. Phys.* 29 815–830 (2008).
22. A. D. Boozer, "General relativity in (1+1) dimensions," *Eur. J. Phys.* **29** 319–333 (2008). [in top 10% of downloads for that quarter across all IOP journals]
23. A. D. Boozer, "Stimulated Raman adiabatic passage in a multilevel atom," *Phys. Rev. A* **77** 023411 (2008).
24. A. D. Boozer, R. Miller, T. E. Northup, A. Boca, and H. Kimble, "Optical pumping via incoherent Raman transitions," *Phys. Rev. A* **76** 063401 (2007).
25. A. D. Boozer, "Retarded potentials and the radiative arrow of time," *Eur. J. Phys.* **28** 1131–1143 (2007).
26. A. D. Boozer, "Quantum field theory in (0+1) dimensions," *Eur. J. Phys.* **28** 729–745 (2007).
27. A. D. Boozer, "A toy model of electrodynamics in (1+1) dimensions," *Eur. J. Phys.* **28** 447–464 (2007). [in top 10% of downloads for that quarter across all IOP journals]
28. A. D. Boozer, A. Boca, R. Miller, T. E. Northup, and H. Kimble, "Reversible state transfer between light and a single trapped atom," *Phys. Rev. Lett.* **98** 193601 (2007). [editor's choice]
29. A. D. Boozer, A. Boca, R. Miller, T. E. Northup, and H. Kimble, "Cooling to the ground state of axial motion for one atom strongly coupled to an optical cavity," *Phys. Rev. Lett.* **97** 083602 (2006). [cover article]
30. K. M. Birnbaum, A. Boca, R. Miller, A. D. Boozer, T. E. Northup, and H. J. Kimble, "Photon blockade in an optical cavity with one trapped atom," *Nature* **436** 87 (2005).
31. R. Miller, T. E. Northup, K. M. Birnbaum, A. Boca, A. D. Boozer, and H. J. Kimble, "Trapped atoms in cavity QED: coupling quantized light and matter," *Journal of Physics B* **38** S551 (2005).
32. A. Boca, R. Miller, K. M. Birnbaum, A. D. Boozer, J. McKeever, and H. J. Kimble, "Observation of the vacuum-Rabi spectrum for one trapped atom," *Phys. Rev. Lett.* **93** 233603 (2004).
33. J. McKeever, J. R. Buck, A. D. Boozer, and H. J. Kimble, "Determination of the number of atoms trapped in an optical cavity," *Phys. Rev. Lett.* **93** 143601 (2004).
34. J. McKeever, A. Boca, A. D. Boozer, R. Miller, J. R. Buck, A. Kuzmich, and H. J. Kimble, "Deterministic generation of single photons from one atom trapped in a cavity," *Science* **303** 1992 (2004).
35. A. D. Boozer, A. Boca, J. R. Buck, J. McKeever, and H. J. Kimble, "Comparison of theory and experiment for a one-atom laser in a regime of strong coupling," *Phys. Rev. A* **70** 023814 (2004).
36. J. McKeever, A. Boca, A. D. Boozer, J. R. Buck, and H. J. Kimble, "Experimental realization of a one-atom laser in the regime of strong coupling," *Nature* **425** 268 (2003).

37. A. Kuzmich, W. P. Bowen, A. D. Boozer, A. Boca, C.-W. Chou, L.-M. Duan, and H. J. Kimble, "Generation of nonclassical photon pairs for scalable quantum communication with atomic ensembles," *Nature* **423** 731 (2003).

38. J. McKeever, J. R. Buck, A. D. Boozer, A. Kuzmich, H. C. Nagerl, D. M. Stamper-Kurn, and H. J. Kimble, "State-insensitive cooling and trapping of single atoms in an optical cavity," *Phys. Rev. Lett.* **90** 133602 (2003).

39. X. Z. Tang, E. R. Tracy, A. D. Boozer, A. deBrauw, and R. Brown, "Symbol sequence statistics in noisy chaotic signal reconstruction," *Phys. Rev. E* **51** 3871 (1995).

40. X. Z. Tang, E. R. Tracy, A. D. Boozer, A. deBrauw, and R. Brown, "Reconstruction of chaotic signals using symbolic data," *Phys. Lett. A* **190** 393 (1994).