

Nathaniel P. Stern

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PROFESSIONAL INTERESTS

Condensed matter physics, quantum optics, spins in nanomaterials, magnetism and magnetic materials

EDUCATION

- Ph. D. in Physics, **University of California, Santa Barbara**, 2008
- M. A. in Physics, **University of California, Santa Barbara**, 2006
- B. S. in Physics with Honors, **Harvey Mudd College**, 2003

APPOINTMENTS

- Assistant Professor, Department of Physics and Astronomy, **Northwestern University**, 2011-
- Richard C. Tolman Prize Postdoctoral Fellow, **California Institute of Technology**, 2008-2011

HONORS AND AWARDS

- **Early Career Research Award**, Office of Science, U.S. Department of Energy, 2014
- **Alfred P. Sloan Research Fellowship**, Alfred P. Sloan Foundation, 2013 -
- **Richard C. Tolman Prize Postdoctoral Fellowship**, California Institute of Technology, 2008-2011
- **Hertz Fellow**, Fannie and John Hertz Foundation, 2003-2008
- **LeRoy Apker Award**, American Physical Society, 2004
- **NSF Graduate Research Fellowship**, National Science Foundation, (*declined for Hertz*), 2003
- **National Defense Science and Engineering Graduate Fellowship**, Department of Defense, (*declined for Hertz*), 2003

SELECTED PUBLICATION LIST

1. E. J. Lenferink, G. Wei, and N. P. Stern. "Coherent optical non-reciprocity in axisymmetric resonators." *Optics Express* **22**, 16099 (2014), arXiv:1404.4863.
2. A. Goban, K. S. Choi, D. J. Alton, D. Ding, C. Lacroûte, M. Pototschnig, T. Thiele, N. P. Stern, H. J. Kimble. "Demonstration of a state-insensitive, compensated nanofiber trap." *Phys. Rev. Lett.* **109**, 033603 (2012), <http://prl.aps.org/abstract/PRL/v109/i3/e033603>.
3. C. Lacroûte, K. S. Choi, A. Goban, D. J. Alton, D. Ding, N. P. Stern, and H. J. Kimble. "A state-insensitive, compensated nanofiber trap." *New J. Phys.* **14**, 023056, (2012), <http://iopscience.iop.org/1367-2630/14/2/023056/>
4. N. P. Stern, D. J. Alton, and H. J. Kimble. "Simulations of atomic trajectories near a dielectric surface." *New J. Phys.* **13**, 085004 (2011), <http://iopscience.iop.org/1367-2630/13/8/085004/>
5. D. J. Alton, N. P. Stern, Takao Aoki, H. Lee, E. Ostby, K. J. Vahala, and H. J. Kimble. "Strong interactions of single atoms and photons near a dielectric boundary." *Nature Physics*, **7**, 159, (2011), <http://www.nature.com/nphys/journal/v7/n2/full/nphys1837.html>.

6. N. P. Stern, D. W. Steuerman, S. Mack, A. C. Gossard, and D.D. Awschalom. "Time-resolved dynamics of the spin Hall effect." *Nature Physics*, **4**, 843, (2008), <http://www.nature.com/nphys/journal/v4/n11/full/nphys1076.html>
7. N. P. Stern, D. W. Steuerman, S. Mack, A. C. Gossard, and D.D. Awschalom. "Drift and diffusion of spins generated by the spin Hall effect." *Appl. Phys. Lett.* **91**, 062109, (2007), <http://dx.doi.org/10.1063/1.2768633>
8. N. P. Stern, S. Ghosh, G. Xiang, M. Zhu, N. Samarth, and D. D. Awschalom. "Current-Induced Polarization and the Spin Hall Effect at Room Temperature." *Phys. Rev. Lett.* **97** 126603, (2006), <http://prl.aps.org/abstract/PRL/v97/i12/e126603>
9. N. P. Stern, M. Poggio, M. H. Bartl, E. L. Hu, G. D. Steeves, and D. D. Awschalom. "Spin dynamics in electrochemically charged CdSe quantum dots." *Phys. Rev. B*, **72** 161303(R), (2005), <http://prb.aps.org/abstract/PRB/v72/i16/e161303>
10. R. C. Myers, M. Poggio, N. P. Stern, A. C. Gossard, and D. D. Awschalom. "Antiferromagnetic s-d exchange coupling in GaMnAs." *Phys. Rev. Lett.* **95**, 017204, (2005), <http://prl.aps.org/abstract/PRL/v95/i1/e017204>

RESEARCH OVERVIEW

My research explores the interconnections between light and matter, primarily at the quantum scale of a single photon. The frontiers of quantum physics lie not only in the manipulation of single particles but in the design of complex systems piece-by-piece; my work studying quantum optical effects in novel materials broadly contributes to this vision by expanding the mechanisms available to link isolated quantum systems together while preserving their unique properties. Progress toward this goal will lead to understanding of new cooperative quantum phenomena potentially relevant for fundamental materials and optical physics, energy efficient opto-electronics, and enhanced control of information.

PROFESSIONAL ACTIVITIES

- **Member:** APS - American Physical Society, SPIE – the international society for optics and photonics
- **Reviewer:** *Nature Publishing Group, Applied Physics Letters, Journal of Applied Physics, European Physical Society, International Journal of Nanotechnology, Optical Society of America, DOE Office of Science Graduate Research Fellowship Program*
- **Invited Professional Presentations:** Over 20 invited presentations at national and international conferences and professional seminars

SYNERGISTIC ACTIVITIES

- **Science Fair/competition Judge (at all levels):** *California State Science Fair*, May 2011, Physics, Senior Division; *Intel International Science and Engineering Fair*, May 2011, SPIE Special Awards Judge; *Caltech SURF*, 2009, Perpall Speaking Award Judge
- **Mentor for undergraduate researchers in science** – 6 students, including underrepresented groups through Caltech MURF (*Minority Undergraduate Research Fellowship*), Northwestern SROP (*Summer Research Opportunity Program*, encouraging minority and other disadvantaged groups)
- **Education/Outreach:** Authored Spintronics chapter for the *Open Textbook for National Nanotechnology Infrastructure Network*, www.nnin.org, 2008