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EDUCATION

Cambridge University
Ph. D. in Experimental Physics

Cambridge, UK
Oct 2009 – Jan 2013

Dissertation: “Control of single InGaAs quantum dots with frequency-swept optical pulses”

Advisor: Prof. Richard Phillips

United States Army War College
M. S. in Strategic Studies

Carlisle Barracks, PA
June 2019 (expected)

Cambridge University
M. A. (*Cantab*) in Natural Sciences

Cambridge, UK
May 2003

United States Naval Academy
B. S. in Physics

Annapolis, MD
May 2001

EMPLOYMENT HISTORY

CIVILIAN EMPLOYMENT

Assistant Professor, Physics Department, U.S. Naval Academy Aug 2013 – present.

Research Associate, U.S. Navy Research Laboratory Oct 2012 – Aug 2013.

U.S. NAVY (Active and Reserve)

Director of Operations (J3), Navy Reserve USF Korea Dec 2018 – present.

Director of Research (O3R), Office of Naval Research Reserve Component Dec 2015 – Nov 2018.

Director of Current Operations, CJTF Horn of Africa Feb 2017 – Mar 2018 (*Mobilized to active duty*).

Executive Officer, SUBGRU TEN Force Protection Detachment ONE Oct 2014 – 2015.

Department Head, Undersea Warfare Operations Detachment L Feb 2012 – Oct 2014.

Program Officer, Office of Naval Research Global Unit 103 Aug 2009 – Aug 2010.

Military Instructor, Physics Department, U.S. Naval Academy, Aug 2007 – Aug 2009.

Submarine Officer, USS MICHIGAN (SSGN 727), Dec 2004 – Aug 2007.

Naval Nuclear Propulsion Training, Aug 2003 – Aug 2004.

Active Top Secret Clearance

RESEARCH EXPERIENCE

Principal Investigator, Quantum Photonics Laboratory, U.S. Naval Academy, 2013 – present.

NRC Research Associate, Quantum Dot Group, Navy Research Laboratory, 2012 – 2013.

Doctoral Researcher, AMOP Group, Cambridge University (UK), 2009 – 2012.

EPSRC III-V Semiconductor Fabrication Course, Sheffield University (UK), Dec 2009.

Summer Research Assistant, Optical Sciences Division, Navy Research Laboratory, 2008 – 2009.

GRANTS

1. ONR UMBC-USNA Cyber Challenge Grant “Spins integrated in tapered fiber and liquid crystal systems”, \$350,000, 3 years, co-PI, 2018–present.
2. OSD Quantum Science and Engineering Program (QSEP) “Proton irradiation and spectroscopy of SiC for single generating single solid state spin qubits”, \$180,000, 3 years, co-I, 2016–present.
3. ONR UMBC-USNA Collaborative Grant N0001415WX01534 “To investigate a novel quantum information processing platform”, \$449,868, 3 years, co-PI, 2015–2018.
4. ONR Grant N0001414WX20764 “Optical characterization and control of single spins in proton irradiated silicon vacancies in bulk and nanocrystalline silicon carbide”, \$104,000, 2 years, PI, 2014–2016

FELLOWSHIPS AND HONORS

National Research Council Research Associate, 2012 – 2013.
Bill and Melinda Gates Cambridge Scholar, 2001 – 2003, 2009 – 2012.
Defense Meritorious Service Medal.
Navy and Marine Corps Commendation Medal (two awards).
Graduate with Distinction, U.S. Naval Academy, 2001.
Trident Scholar, U.S. Naval Academy, 2000 – 2001.

PROFESSIONAL ACTIVITIES

Reviewer for Solid State Communications, Optics Letters, Optics Express, Optica, Journal of Applied Physics.
Member, American Physical Society (2001–present).
Member, Optical Society of America (2009–present).
Member, American Association of Physics Teachers (2008–present).
Associate Member, Institute of Physics (UK) (2009–present).
Member, IEEE (2009–present).

PUBLISHED ARTICLES

JOURNAL ARTICLES

1. R. Basu, N. Skaggs, S. Shalov and P. G. Brereton, “Evidence of nanodiamond-self-assembly in a liquid crystal, and the consequent impacts on the liquid crystal properties” *AIP Adv.* 7, 075008 (2017).
2. P. M. Vora, A. S. Bracker, S. G. Carter, T. M. Sweeney, M. Kim, C. S. Kim, L. Yang, P. G. Brereton, S. E. Economou, and D. Gammon, “Spin-cavity interactions between a quantum dot molecule and a photonic crystal cavity” *Nat. Comm.* 6, 7665 (2015).
3. T. M. Sweeney, S. G. Carter, A. S. Bracker, M. Kim, C. S. Kim, L. Yang, P. Vora, P. G. Brereton, E. R. Cleveland, and D. Gammon, “Cavity-stimulated Raman emission from a single quantum dot spin” *Nat. Phot.* 8, 442 (2014).
4. M. K. Yakes, L. Yang, A. S. Bracker, T. M. Sweeney, P. G. Brereton, M. Kim, C. S. Kim, P. M. Vora, D. Park, S. G. Carter, and D. Gammon, “Leveraging crystal anisotropy for deterministic growth of InAs quantum dots with narrow optical linewidths”, *Nano Lett.*, 13, 4870 (2013).
5. B. Van Hattem, P. Corfdir, P. G. Brereton, P. Pearce, A. M. Graham, M. J. Stanley, M. Hugues, M. Hopkinson, and R. T. Phillips, “From the artificial atom to the Kondo-Anderson model: Orientation-dependent magnetophotoluminescence of charged excitons in InAs quantum dots”, *Phys. Rev. B*, 87, 205308 (2013).
6. T. M. Godden, J. H. Quilter, A.J. Ramsay, Yanwen Wu, P. G. Brereton, I. J. Luxmoore, J. Puebla, A.M. Fox, and M. S. Skolnick, “Fast preparation of a single-hole spin in an InAs/GaAs quantum dot in a Voigt-geometry magnetic field”, *Phys. Rev. B*, 85, 155310 (2012).
7. T. M. Godden, J. H. Quilter, A.J. Ramsay, Yanwen Wu, P. G. Brereton, S. J. Boyle, I. J. Luxmoore, J. Puebla-Nunez, A.M. Fox, and M. S. Skolnick, “Coherent optical control of the spin of a single hole in a quantum dot”, *Phys. Rev. Lett.*, 108, 017402 (2012).
8. Y. Wu, I. M. Piper, M. Ediger, P. G. Brereton, E. R. Schmidgall, P. R. Eastham, M. Hugues, M. Hopkinson, and R. T. Phillips, “Population Inversion in a Single InGaAs Quantum Dot Using the Method of Adiabatic Rapid Passage”, *Phys. Rev. Lett.*, 106, 067401 (2011).

CONFERENCE PROCEEDINGS

9. B. Van Hattem, P. Corfdir, P. G. Brereton, P. Pearce, A. M. Graham, M. J. Stanley, M. Hugues, M. Hopkinson, and R. T. Phillips, “Photoluminescence in tilted magnetic field of triply negatively charged excitons hybridized with a continuum”, *Acta Physica Polonica A*, 124, QQ 8882 (2013).
10. P. G. Brereton, M. Stanley, A. Graham, B. Van Hattem, P. Corfdir, I. Houghton, Y. Wu., M. Hopkinson, R. T. Phillips, “Adiabatic rapid passage in single InGaAs quantum dots: Towards a method of ‘incoherent control’,” *Bulletin of the American Physical Society*, 58, American Physical Society, 2013, BAPS.2013.MAR.J22.6
11. P. G. Brereton, Y. Wu, I. Piper, M. Ediger, E. Schmidgall, R. Phillips, P. Eastham, M. Hugues and M. Hopkinson. “Robust Optical Inversion of the Excitonic Population of InGaAs Quantum Dots via Adiabatic Rapid Passage”, *Quantum Electronics and Laser Science Conference, Quantum Electronics and Laser Science Conference, Optical Society of America*, 2011, QMK2

CONFERENCE PRESENTATIONS

TALKS

1. Peter Brereton, Donal Puent, Evan Glaser, Sam Carter, “Coherence studies on silicon vacancies in SiC generated via proton irradiation”, *APS March Meeting* (2016)
2. Sam Carter, Evan Claser, Jaime Freitas, Joe Tischler, Peter Brereton, Osama Nayfeh, “SiC qubits”, *OSD QSEP Review* (2016)
3. P. Brereton “Spin qubit generation via proton irradiation of SiC”, *George Mason University Colloquium*, **invited** (2015)
4. Sam Carter, T. M. Sweeney, P. M. Vora, M. Kim, C. S. Kim, L. Yang, P. G. Brereton, D. Solenov, S. E. Economou, T. L. Reinecke, A. S. Bracker and Dan Gammon, “Coupling Spins in Quantum Dots to Photonic Crystal Cavities”, *Frontiers in Optics and Laser Science*, *Tuscon* (2014).
5. P. M. Vora, T. M. Sweeney, S. G. Carter, A. S. Bracker, M. Kim, C. Kim, L. Yang, P. G. Brereton, S. E. Economou, and D. Gammon, “Cavity QED with Single and Couple Quantum Dot Spins”, *International Conference on Quantum Dots*, *Pisa* (2014).
6. P. Vora, S. Carter, C. S. Kim, M. Kim, T. Sweeney, L. Yang, P. Brereton, A. Bracker, and D. Gammon, “Cavity QED in a Quantum Dot Molecule Coupled to a Photonic Crystal Cavity”, *APS March Meeting*, *Denver, CO* (2014).
7. B. Van Hattem, P. Corfdir, P. G. Brereton, P. Pearce, A. M. Graham, M. J. Stanley, M. Hugues, M. Hopkinson, and R. T. Phillips, “Charged excitons coupled to a continuum of states: orientation dependent magnetophotoluminescence of InAs quantum dots”, *Optics of Excitons in Confined Systems 13*, *Rome* (2013).
8. P. G. Brereton, M. J. Stanley, Y. Wu, A. M. Graham, B. Van Hattem, P. M. Corfdir, I. M. P. Houghton, M. Hopkinson, R. T. Phillips “Adiabatic rapid passage in single InGaAs quantum dots: Towards a method of ‘incoherent control’,” *APS March Meeting*, *Baltimore, MD* (2013).
9. P. G. Brereton (talk given by R. T. Phillips), I. M. Piper, Y. Wu, M. Ediger, E. R. Schmidgall, P. R. Eastham, C. Creatore, M. Hughes, M. Hopkinson, R. T. Phillips “Adiabatic rapid passage in semiconductors,” *Optical Properties of Nanostructures*, *University of Bayreuth*, (2013).
10. P. G. Brereton (talk given by R. T. Phillips), Y. Wu, I. M. Piper, M. Ediger, R. T. Phillips, M. Hugues, M. Hopkinson, “Adiabatic rapid passage in semiconductor quantum dots,” *Optics of Excitons in Confined Systems 12*, *Paris* (2011).
11. P. G. Brereton, Y. Wu, I. M. Piper, E. R. Schmidgall, P. R. Eastham, M. Hugues, M. Hopkinson, R. T. Phillips, “Robust optical inversion of the excitonic population of InGaAs quantum dots via adiabatic rapid passage,” *CLEO 2011*, *Baltimore, MD* (2011).
12. P. G. Brereton, Y. Wu, I. M. Piper, M. Ediger, E. R. Schmidgall, P. R. Eastham, M. Hugues, M. Hopkinson, R. T. Phillips, “Robust optical inversion of the excitonic population of InGaAs quantum dots via adiabatic rapid passage,” *IOP Quantum Dot One-Day Meeting 2011*, *Bristol, UK* (2011).
13. Y. Wu, I. M. Piper, M. Ediger, P. G. Brereton, E. R. Hugues, M. Hopkinson, P. R. Eastham and R. T. Phillips, “Adiabatic rapid passage as a route to state preparation in quantum dot systems,” *NOEKS 10*, *Paderborn, Germany* (2010).