Dustin A. Gilbert

NIST Center for Neutron Research
100 Bureau Drive, MS 6100
Gaithersburg, MD, 20899
Website: http://www.dustingilbert.com/
Google Scholar: https://scholar.google.com/citations?user=gtU1kf0AAAAJ
Researcher ID: http://www.researcherid.com/rid/G-1683-2011

Tel: (831) 566-4436
dustin.gilbert@nist.gov
dagilbert1031@gmail.com

Highlights

Institute of Physics, Nanotechnology Young Researcher Runner-Up, 2016
NRC Postdoctoral fellowship at NIST Center for Neutron Research
Ph.D. Physics, 2014 UC Davis, "Physics on the Nanoscale - a Study of Nanomagnetic Phenomena"
27 refereed journal publications, 11 as first author, including 3 in *Nature Communications*
30 Invited talks, including a symposium at MMM2016 and Keynote at the 2016 FORC Workshop
26 Contributed talks, 3 filed patent applications

Education

Ph.D., Physics, September 2014, University of California, Davis, California
M.S., Physics, December 2010, University of California, Davis, California
B.S., Physics, June 2008, University of California, Santa Cruz, California
Honors Thesis; Subject Honors

Experience

Research Physicist	2016-	National Institute of Standards and Technology
Postdoctoral Research Fellow	2014-2016	NIST Center for Neutron Research with Drs. Julie Borchers, funded by the NRC RAP
Graduate Student Researcher	2009-2014	U.C. Davis Physics Department, with Prof. Kai Liu
Research Intern	2010	Seagate Technology, with Dr. Jan-Ulrich Thiele
Teaching Assistant	2008-09	U.C. Davis Physics Department
Research Assistant	2008-11	Naval Postgraduate School, with Prof. William Maier
Summer Intern	2008	Naval Postgraduate School, organized by California Homeland Security Consortium
Learning Assistant	2007-08	U.C. Santa Cruz Academic Resource Center
Technical Assistant	2005	CUBIC Defense Applications

Honors and Awards

- IOP Publishing "Nanotechnology Young Researchers Award" 2016
- National Research Council Research Associateship Program Postdoctoral Fellowship (2014-16)
- 1st Prize Margaret Burbidge Award for Best Experimental Research by a Graduate Student – APS Far West Section Meeting, Sonoma, CA November 2013
- Selected Participant of IEEE Summer School on Magnetism – Chennai, India Summer 2012
- UC Davis Graduate Program Fellowship – Winter 2012, Summer 2012
- UC Davis Summer Graduate Student Researcher Award, Summer 2011
- National Science Foundation Graduate Student Fellowship Program "Honorable Mention", 2010
- Academic honors in Physics from UC Santa Cruz, 2008
- Honors Thesis "Design, Modeling, Construction and Testing of a One Meter Parallel Rail Accelerator", UC Santa Cruz, 2008

Research Interests

Properties of nanostructured materials and nanoscale phenomena. Interactions and reversal behavior in hysteretic systems. Topics include structural, magnetic, electrical and thermal properties of nanostructured systems including nanoparticles, wires, continuous and patterned thin-films, e-beam and photolithography defined features, patterned substrates, and nanocomposite materials. Neutron scattering to identify buried magnetic features. *Current topics have included magnetic skyrmions, control of magnetism by oxygen ion migration, and spin currents*.

Technical Skills

Fabrication: *Deposition:* DC and RF magnetron sputtering, e-beam evaporation, electrodeposition (films and template-assisted growth of nanowires). *Exposure:* Nanopatterning by e-beam and photolithography, stepper photolithography, direct-write laser photomask writer and photomask design. *Patterning:* reactive ion (plasma) etching and ion milling, wet chemical etching. Lift-off deposition. Tube furnace annealing and rapid thermal annealing.

Characterization: *Microscopy:* Scanning electron microscopy (SEM), atomic/magnetic force microscopy (AFM/MFM). *Structural and Chemical Analysis:* X-ray diffraction, x-ray reflectivity, and pole figures. Energy dispersive x-ray spectroscopy (EDS). *Magnetometry:* vibrating sample magnetometer (VSM), alternating gradient magnetometer (AGM), longitudinal, transverse and polar magneto-optical Kerr effect (MOKE) magnetometer, B-H looper fluxgate magnetometer, superconducting quantum interference device (SQUID) magnetometer. *Electrical and spin transport by 4-probe measurements*.

Specialized Skills: Polarized neutron scattering, including polarized neutron reflectometry (PNR), (polarized) and small angle neutron scattering (SANS). Synchrotron X-ray absorption spectroscopy (XAS) and magnetic circular and linear dichroism (XMCD/XMLD); Magnetic Transmission X-Ray Microscopy (MTXM). Magnetization reversal behavior and quantitative determination of interactions and intrinsic behaviors using the first-order reversal curve (FORC) technique and ΔM measurements.

Other: Cryogen (helium and nitrogen) and high temperature furnace (<1000 K) experience. Quartz tube-working. Gas absorption/desorption isotherms. Extensive experience with vacuum system maintenance, repair, refurbishment. Growth of anodized aluminum oxide (AAO) templates. Simulation and data processing code in OOMMF, C++ and Mathematica. Machine control with Labview. Metal working (machine shop technology) certificate training and experience. I have been responsible for writing and maintaining the SOPs, training documents and safety records.

Professional Activity

Member, American Physical Society, Institute of Electrical and Electronics Engineers (IEEE)

Refereed articles for Physical Review B, Physical Review Applied, Journal of Applied Physics, Scientific Reports, IEEE Transactions on Magnetics, Journal of Magnetism and Magnetic Materials, Physica B, and Applied Physics A

Chaired conference sections at MMM 2014, 2016, 2017, Joint MMM-Intermag 2015, EMN Open-Access Week 2015, APS March Meeting 2016, International Conference of Asian Union of Magnetics Societies 2016, International Conference on Neutron Scattering2017

Program Committee for 2017 MMM; Sorter for APS March Meeting 2016

Refereed Journal Publications

1. M. Frampton, J. Crocker, **D. A. Gilbert**,* N. Curro, Kai Liu, J. A. Schneeloch, G. Gu, and R. J. Zieve,* "First Order Reversal Curve of the Magneto-Structural Phase Transition in FeTe", *Physical Review B,* **95**, 214402 (2017). *Corresponding authors.

2. **Dustin A. Gilbert**, J. G. Ramirez, S. Wang, I. K. Schuller, Kai Liu, J. de la Venta, "Growth-Induced In-Plane Uniaxial Anisotropy V_2O_3/Ni films revealed by FORC measurements", **In Press,** Arxiv

3. **Dustin A. Gilbert,*** Alexander J. Grutter, Peyton D. Murray, Rajesh V. Chopdekar, Alexander M. Kane, Aleksey L. Ionin, Michael S. Lee, Steven R. Spurgeon, Brian J. Kirby, Brian B. Maranville, Alpha T. N'Diaye, Apurva Mehta, Elke Arenholz, Kai Liu, Yayoi Takamura, and Julie A. Borchers "Ionic Tuning of Cobaltites at the Nanoscale", **Under Review.**

4. **D. A. Gilbert**, E. C. Burks, S. Ushakov, Randy Dumas, Patricia Abellan Baeza, Ilke Arslan, Thomas Felter, Alexandra Navrotsky, and Kai Liu, "Tunable Low Density Palladium Nanowire Foams", **Under Review.**

5. **Dustin A. Gilbert**,* Alexander. J Grutter, Elke Arenholz, Kai Liu, Brian J. Kirby, Julie Borchers, Brain B. Maranville "Structural and Magnetic Depth Profiles of Magneto-Ionic Heterostructures Beyond the Interface", *Nature Communications* **7**, 12264 (2016).

Featured by MRS Bulletin

6. **Dustin A. Gilbert,** J. Olamit, R. K. Dumas, B. J. Kirby, A. J. Grutter, B. B. Maranville, E. Arenholz, J. A. Borchers, and Kai Liu, "Tunable Positive Exchange Bias via Redox-Driven Oxygen Migration", *Nature Communications*, **7**, 11050 (2016).

7. **Dustin A. Gilbert**, Jung-Wei Liao, Brian J. Kirby, Michael Winklhofer, Chih-Huang Lai, Kai Liu "Magnetic Yoking and Tunable Interactions in FePt-Based Hard/Soft Bilayers" *Scientific Reports*, **6**, 32842 (2016).

8. Alexander J. Grutter, **Dustin A. Gilbert**, Elke Arenholz, Kai Liu, Brain B. Maranville, Julie Borchers, Brian J. Kirby "Reversible Control of Magnetism in $La_{0.67}Sr_{0.33}MnO_3$ Through Chemically-Induced Oxygen Migration" *Applied Physics Letters* **108**, 082405 (2016).

9. Eric P. Vetter, Liwei Geng, Priya Ghatwai, **Dustin A. Gilbert**, Yongmei Jin, William A. Soffa and Jerrold A. Floro, "Lengthscale effects on exchange coupling in Co-Pt $L1_0$+$L1_2$ nanochessboards" *APL Materials*, **4,** 096103 (2016).

10. I. Hallsteinsen, M. Moreau, A. Grutter, M. Nord, P.-E. Vullum, **D. A. Gilbert**, T. Bolstad, J. K. Grepstad, R. Holmestad, S. M. Selbach, A. T. N'Diaye, B. J. Kirby, E. Arenholz, T Tybell, "Structurally driven magnetic reconstructions at the interface of (111)-oriented $La_{0.7}Sr_{0.3}MnO_3$/$LaFeO_3$", *Physical Review B (Rapid)* **94**, 201115(R) (2016).

11. L. Yu, Z. Y. Yan, H. C. Yang, X. Z. Chai, B. Q. Li, S. Moeendarbari, Y. W. Hao, D. Zhang, G. Feng, P. Han, **D. A. Gilbert**, Kai Liu, K. S. Buchanan, and X. M. Cheng, "Magnetization reversal of three-dimensional nickel anti-sphere arrays" *IEEE Magnetics Letters*, **8**, 4100104 (2016).

12. **Dustin A. Gilbert**, Brian B. Maranville, Andrew L. Balk, Brian J. Kirby, Peter Fischer, Daniel T. Pierce, John Unguris, Julie A. Borchers, and Kai Liu, "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", *Nature Communications*, **6**, 8462 (2015).

    Featured on over a dozen popular science news sources, including IEEE Spectrum (Oct. 13, 2015), and NSF and NIST websites.

13. **D. A. Gilbert**, Li Ye, A. Varea, S. Agramunt-Puig, N. Del-Valle, C. Navau, A. Sanchez, J. F. Lopez-Barbera, K. S. Buchanan, A. Hoffmann, J. Sort, Kai Liu, and J. Nogues, "A New Reversal Mode in Exchange Coupled Antiferromagnetic/Ferromagnetic Disks: Distorted Viscous Vortex", *Nanoscale* 7, 9878 (2015)

14. **D.A. Gilbert**, G.T. Zimanyi, R.K. Dumas, M. Winklhofer, A. Gomez, N. Eibagi, J.L. Vincent, and Kai Liu, "Quantitative Decoding of Interactions in Tunable Nanomagnet Arrays Using First Order Reversal Curves", *Scientific Reports* **4**, 4204 (2014).

    Thomson Reuters Web of Science Highly Cited Paper ("top 1% of the academic field of Physics based on a cited threshold for the field and publication year")

15. **D. A. Gilbert**, J. W. Liao, L. W. Wang, J. W. Lau, T. J. Klemmer, J. U. Thiele, C. H. Lai, and Kai Liu, "Probing the A1 to $L1_0$ Transformation in FeCuPt Using the First Order Reversal Curve Method", *APL Materials* **2**, 086106 (2014).

16. L. Ma, **D. A. Gilbert**, V. Neu, R. Schafer, J. G. Zheng, X. Q. Yan, Z. Shi, Kai Liu, and S. M. Zhou, "Magnetization reversal in perpendicularly magnetized $L1_0$ FePd/FePt heretostructures", *Journal of Applied Physics* **116**, 033922 (2014).

17. R. K. Dumas, P. K. Greene, **D. A. Gilbert**, Li Ye, C. Zha, J. Åkerman, and Kai Liu "Accessing Different Spin-Disordered States using First Order Reversal Curves", *Physical Review B*, **90**, 104410 (2014).

18. **Dustin A. Gilbert**, Liang-Wei Wang, Chih-Huang Lai, Timothy Klemmer, Jan-Ulrich Thiele, Kai Liu, "Tuning magnetic anisotropy in (001) oriented $L1_0$ $(Fe_{1-x}Cu_x)_{55}Pt_{45}$ films", *Applied Physics Letters*, **102**, 132406 (2013).

    Featured in APL 'Research Highlights', 'Top Stories', and top 15 most accessed articles in APL, 2013. Carried by over 16 popular science news outlets including Eureka Alert, Phys.org, R&D Magazine, and Science Daily.

19. J.E. Davies, **D. A. Gilbert,** M. Mohseni, R.K. Dumas, J. Akerman, and Kai Liu, "Reversal mode instability and magnetoresistance in perpendicular (Co/Pd)/Cu/(Co/Ni) pseudo-spin-valves", *Applied Physics Letters*, **103**, 022409 (2013).

20. A. Gomez, **D. A. Gilbert**, E. M. Gonzalez, Kai Liu and J. L. Vicent, "Control of dissipation in superconducting films by magnetic stray fields", *Applied Physics Letters*, **102**, 052601 (2013).

21. A. Gomez, E. M. Gonzalez, **D. A. Gilbert**, M. V. Milosevic, Kai Liu and J. L. Vicent, "Probing the dynamic response of antivortex, interstitial and trapped vortex lattices on magnetic periodic pinning potentials", *Superconductor Science and Technology*, **26**, 085018 (2013).

22. R. Brandt, R. Ruckriem, **D. A. Gilbert,** F. Ganss, T. Senn, Kai Liu, M. Albrecht, and H. Schmidt, "Size dependence of the switching characteristics and spin wave modes of single FePt nanocaps", *Journal of Applied Physics*, **113**, 203910 (2013).

23. Jeong C. Park, **Dustin A. Gilbert**, Kai Liu, Angelique Y. Louie, "Microwave enhanced silica encapsulation of magnetic nanoparticles", *Journal of Materials Chemistry*, **22**, 8449 (2012).

24. Ray M. Wong, **Dustin A. Gilbert**, Kai Liu, Angelique Y. Louie, "Rapid Size-Controlled Synthesis of Dextran-Coated, Copper-Doped Iron Oxide Nanoparticles", *ACS Nano*, **6**, 3461 (2012).

25. Elizabeth A Osborne, Tonya Atkins, **Dustin Gilbert**, Susan Kauzlarich, Kai Liu, and Angelique Y Louie "Rapid microwave-assisted synthesis of dextran-coated iron oxide nanoparticles for magnetic resonance imaging", *Nanotechnology*, **23,** 215602 (2012).

26. B.F. Valcu, **D. A. Gilbert**, K. Liu, "Fingerprinting Inhomogeneities in Magnetic Recording Media using the First Order Reversal Curve Method", *IEEE Transactions on Magnetics*, **47**, 2988 (2011).

27. R.K. Dumas, **D. A. Gilbert**, N. Eibagi, K. Liu, "Chirality control and vortex manipulation in asymmetric Co dots" *Physical Review B*, **83**, 060415(R) (2011).

Manuscripts in Preparation

28. **Dustin A. Gilbert**, Alexander J. Grutter, Paul Neves, Kathryn Krycka, Nicholas Butch, Sunxiang Huang, Julie A. Borchers "Precipitating Ordered Skyrmion Lattices from Helical Spaghetti" **In Preparation**

29. Alexander J. Grutter, Steve Disseler, Un-Jun Moon, **Dustin A. Gilbert**, Elke Arenholz, Steven J. May "Strain induced magnetoelectronic phase separation and antiferromagnetism in Europium Strontium Manganite" **In Preparation**

30. **Dustin A. Gilbert,** Randy K. Dumas, Joseph Davies, Kai Liu, "Building Bridges from FORC to phase-resolved major loops" **In Preparation**.

31. **Dustin A. Gilbert**, Thomas Schrefl, Kai Liu, Gergely Zimanyi "Identifying Multidomain Reversal Behavior Using First Order Reversal Curves" **In Preparation**.

32. **Dustin A. Gilbert,** Randy K. Dumas, Joseph Davies, Kai Liu, "Experimental Investigations of reversibility in the FORC distribution" **In Preparation**.

Other Publications

1. **Dustin A. Gilbert**, Alexander. J Grutter, Elke Arenholz, Kai Liu, Brian J. Kirby, Julie Borchers, Brain B. Maranville "Structural and Magnetic Depth Profiles of Magneto-Ionic Heterostructures Beyond the Interface" NIST Center for Neutron Research Annual Highlights, 2016

2. **Dustin A. Gilbert**, Brian B. Maranville, Andrew L. Balk, Brian J. Kirby, Peter Fischer, Daniel T. Pierce, John Unguris, Julie A. Borchers, and Kai Liu, "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature" NIST Center for Neutron Research Annual Highlights, 2016

3. **D. A. Gilbert**, J. W. Liao, L. W. Wang, J. W. Lau, T. J. Klemmer, J. U. Thiele, C. H. Lai, and Kai Liu, "Magnetometry-based order parameter to probe the A1 to $L1_0$ transformation in FeCuPt for heat-assisted magnetic recording media", IEEE International Magnetics Conference Digest, AA-06, DOI:10.1109/INTMAG.2015.7156496 (2015).

4. **D. A. Gilbert** G.T. Zimanyi, R.K. Dumas, M. Winklhofer, A. Gomez, N. Eibagi, J.L. Vincent, and Kai Liu, "Distinguishing Nearest Neighbor and Mean Field Interactions in Nanomagnet Arrays Using the FORC Technique", 2014 IEEE International Magnetics Conference Digest, FH-05 (2014).

5. **D. A. Gilbert**, Jung-Wei Liao, Liang-Wei Wang, Chih-Huang Lai, Timothy Klemmer, Jan-Ulrich Thiele, Kai Liu, "Probing the A1 to L10 Transformation in FeCuPt Using the First Order Reversal Curve Method", 2014 IEEE International Magnetics Conference Digest, BB-11 (2014).

6. Jung-Wei Liao, Unai Atxitia, **Dustin Gilbert**, Richard Evans, Brian Kirby, Kai Liu, Roy Chantrell, Chih-Huang Lai, "Magnetization reversal modes in $L1_0$ FePt based exchange spring magnets with magnetically soft layers of varied Curie temperature", 2014 IEEE International Magnetics Conference Digest, ES-08 (2014).

7. **D. A. Gilbert** and Kai Liu, "Probing magnetic configurations and interactions in embedded multilayered Co/Pd nanowires", 2011 IEEE International Magnetics Conference Digest, FB-03 (2011).

8. Jeffrey Colvin, Supakit Charnvanichborikarn, Tom Felter, Chad Flores, Kevin Fournier, **Dustin Gilbert**, Sergei Kucheyev, Kai Liu, "On Optimizing K-Shell X-ray Conversion Efficiencies with New Nano-structured Laser Targets", Bulletin of the American Physical Society, 56, 259 (2011).

Patents

- D. A. Gilbert and Kai Liu, *Ground State Artificial Skyrmion Lattices at Room Temperature*, US Provisional Patent Application 62,201,192, August 5, 2015, patent application filed August 5, 2016.
- E. Burks, D. A. Gilbert, Kai Liu, S. Kucheyev, T. Felter, and J. Colvin, *Low density interconnected metal foams*, U.S. Provisional Patent Application 62,261,211 (2015).
- Kai Liu, J. De Rojas, and D. A. Gilbert, *Synthesis of tetrataenite thin films via rapid thermal annealing*, US Provisional Patent Application 62,343,531, May 31, 2016.

Presentations

Invited talks

1. "Ionic Control of Materials Beyond Interfaces" Germany Physical Society, Berlin, Germany March 12-16, 2017

2. "TBA" Physics Colloquium, Colorado State University, Fort Collins, CO, Sept. 25, 2017

3. "Mapping inside magneto-ionic devices with neutron reflectometry" International Conference on Neutron Scattering (ICNS), Daejeong, Korea, July 9-13, 2017.

4. "Future Opportunities in Spintronics: Magnetic Skyrmions and Magneto-Ionics" HRL Laboratory, Malibu, CA May 17, 2017.

5. "Probing depth-dependent spin textures in artificial skyrmions and HAMR media" American Physical Society March Meeting, New Orleans, LA, Mar. 13, 2017.

6. "Designing and Controlling Magnetic Materials with Electric Fields" École Polytechnique Fédérale de Lausanne, Materials Science Department Colloquium, Lausanne, Switzerland, Mar. 3, 2017.

7. "Designing and Controlling Magnetic Materials with Electric Fields" Virginia Polytechnic Institute and State University Physics Department Colloquium, Blacksburg, VA, Feb. 16, 2017.

8. "Designing and Controlling Magnetic Materials with Electric Fields" Boston College Physics Department Colloquium, Boston, MA, Feb. 08, 2017.

9. "Artificial Magnetic Skyrmion Lattices Stable at Ambient Conditions" 37th REIMEI Workshop on Frontiers of Correlated Quantum Matter and Spintronics, Tokai, Japan, Jan 14, 2017.

10. "Beyond the Interface: Structural and Magnetic Depth Profiles of Magneto-Ionic Heterostructures", 61st Annual Conference on Magnetism and Magnetic Materials (2016 MMM), New Orleans, LA, Oct. 31 - Nov. 4, 2016.

11. "How I learned to stop worrying and love the FORC method"**,** Keynote talk, Second Annual FORC Workshop (FORCw), New Orleans, LA, Oct. 30, 2016.

12. "Oxygen Migration and Nanophases", Advanced Light Source Users Meeting, Workshop on Ordering Phenomena in Functional Complex Oxides, Berkeley, CA, Oct. 04, 2016.

13. "Future Opportunities in Spintronics: Magnetic Skyrmions and Magneto-Ionics", Symposium Talk, Brazilian Physics Society 50th Anniversary Meeting, Natal, Brazil, Sept. 3-7, 2016.

14. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", International Conference of Asian Union of Magnetics Societies, Tainan, Taiwan, Aug. 1-5, 2016.

15. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", American Conference on Neutron Scattering, Long Beach, CA July 10-14, 2016.

16. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", International Conference on Polarized Neutrons for Condensed Matter Investigations, Munich, Germany, July 4-7, 2016.

17. "Future Opportunities in Spintronics: Magnetic Skyrmions and Magneto-Ionics", Physics Department Condensed Matter Seminar, University of Delaware, Newark, Delaware, May 31, 2016.

18. "Future Opportunities in Spintronics: Magnetic Skyrmions and Magneto-Ionics", Physics Department Condensed Matter Seminar, University of California, Davis, May 12, 2016.

19. "Future Opportunities in Spintronics: Magnetic Skyrmions and Magneto-Ionics", Physics Department Condensed Matter Seminar, Tsinghua University, Beijing, China, May 5 2016.

20. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", Inaugural Meeting for the Fert Spintronics Center at Beihang University, Beijing, China, April 30-May 3, 2016.

21. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", 'Low-Q' seminar, National Institute of Standards and Technology, Gaithersburg, MD, May 27, 2016.

22. "Designing Nanomaterials by Controlling Oxygen Distributions", Naval Postgraduate School, Monterey, CA, Jan 29, 2016.

23. "Experimental Realization of Artificial Skyrmion Lattices", "Future Directions in Magnetism" Workshop, Tsinghua Sanya International Mathematics Forum, Sanya, Hainan, China, December 14, 2015.

24. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", University of Maryland, Condensed Matter Physics Colloquium, November 19, 2015.

25. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature", Center for Memory and Recording Research, University of California, San Diego, CA, October 08, 2015.

26. "Designing Functional Magnetic Interfaces through Oxygen Migration", University of Virginia, Materials Science and Engineering Colloquium, Charlottesville, VA October 05, 2015.

27. "Designing Functional Magnetic Interfaces through Oxygen Migration", Energy Materials Nanotechnology Open 2015, Chengdu, China, September 22, 2015.

28. "Experimental Realization of Artificial Skyrmion Lattices", Magnetics Group Meeting, National Institute of Standards and Technology, Gaithersburg, MD, July 7, 2015.

29. "Traversing the Minor-Loop Landscape with the FORC Technique", NIST Center for Neutron Research, Gaithersburg, MD, February 6, 2014.

30. "Tuning magnetic anisotropy in (001) oriented $L1_0$ $(Fe_{1-x}Cu_x)_{55}Pt_{45}$ films", IEEE Santa Clara Valley Magnetics Society Monthly Meeting, Santa Clara, CA, November 19, 2013.

Contributed Presentations

1. "Ionic tuning of cobaltates at the nanoscale" **Dustin Gilbert,** Alexander J. Grutter, Peyton D. Murray, Rajesh V. Chopdekar, Alexander M. Kane, Aleksey L. Ionin, Michael S. Lee, Steven R. Spurgeon, Brian J. Kirby, Brian B. Maranville, Alpha T. N'Diaye, Apurva Mehta, Elke Arenholz, Kai Liu, Yayoi Takamura, and Julie A. Borchers, MMM 2017, Pittsburgh, PA, Nov. 10, 2017

2. "Structural and Magnetic Depth Profiles of Magneto-Ionic Heterostructures Beyond the Interface Limit" **Dustin A. Gilbert**, Alexander Grutter, Elke Arenholz, Kai Liu, B. J. Kirby, Julie Borchers, Brian B. Maranville, Fundamental Physics of Ferroelectrics and related materials workshop, Williamsburg, VA Jan. 29, 2017.

3. "Room Temperature Planar Artificial Skyrmion Lattices" **Dustin A. Gilbert**, Brian B. Maranville, Andrew L. Balk, B. J. Kirby, Peter Fischer, Daniel T. Pierce, John Unguris, Julie Borchers, Kai Liu, MMM 2016, New Orleans, LA, Oct. 31 - Nov. 4, 2016

4. "Controlling Magnetism by Electric Field Moderated Forced Oxygen Migration" **Dustin A. Gilbert**, Alexander Grutter, Elke Arenholz, Kai Liu, B. J. Kirby, Julie Borchers, Brian B. Maranville, Sigma-Xi Poster Conference, Gaithersburg, MD, Feb. 19, 2016

5. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature" **Dustin A. Gilbert**, Brian B. Maranville, Andrew L. Balk, B. J. Kirby, Peter Fischer, Daniel T. Pierce, John Unguris, Julie Borchers, Kai Liu, Joint Intermag-MMM Conference, San Diego, CA, Jan. 11-15, 2016

6. "Controlling Magnetism by Electric Field Moderated Forced Oxygen Migration" **Dustin A. Gilbert**, Alexander Grutter, Elke Arenholz, Kai Liu, B. J. Kirby, Julie Borchers, Brian B. Maranville, Joint Intermag-MMM Conference, San Diego, CA, Jan. 11-15, 2016

7. "Probing Buried Magnetic Interfaces with PNR" **Dustin A. Gilbert**, Alexander Grutter, B. J. Kirby, Brian B. Maranville, Julie Borchers, University of Delaware Neutron Day, Nov. 4, 2015

8. "Tunable Positive/Negative Exchange Bias in Gd_xFe_{1-x}/NiCoO Thin Films" **Dustin Gilbert**, Justin Olamit, Brian J. Kirby, Randy K. Dumas, Elke Arenholz, Kai Liu, American Physical Society March Meeting, San Antonio, TX, March 2-6, 2015

9. "Experimental Realization of Artificial Skyrmion Lattices" **Dustin Gilbert**, Brian Maranville, Andrew L. Balk, Brian J. Kirby, Peter Fischer, Daniel T. Pierce, John Unguris, Julie A. Borchers, Kai Liu, American Physical Society March Meeting, San Antonio, TX, March 2-6, 2015

10. "Realization of Ground State Artificial Skyrmion Lattices at Room Temperature" **Dustin A. Gilbert**, Brian B. Maranville, Andrew L. Balk, B. J. Kirby, Peter Fischer, Daniel T. Pierce, John Unguris, Julie Borchers, Kai Liu, Sigma-Xi Poster Conference, Gaithersburg, MD, Feb. 18, 2015

11. "Magnetic Yoking and Enhanced Interactions in Perpendicular $L1_0$-FePt based Hard/Soft Bilayers" **Dustin A. Gilbert,** Jung-Wei Liao, Michael Winklhofer, Chih-Huang Lai, Kai Liu MMM 2014, Honolulu, Hawaii, November 5, 2014

12. "Experimental Realization of Artificial Skyrmion Lattices" **Dustin A. Gilbert,** Brian Maranville, Brian Kerby, Andrew Balk, John Unguris, Peter Fischer, Julie Borchers, Kai Liu MMM 2014, Honolulu, Hawaii, November 8, 2014

13. "Distinguishing Nearest Neighbor and Mean Field Interactions in Nanomagnet Arrays Using the FORC Technique" **D.A. Gilbert** G.T. Zimanyi, R.K. Dumas, M. Winklhofer, A. Gomez, N. Eibagi, J.L. Vincent, and Kai Liu, 2014 IEEE International Magnetics Conference, Intermag, Dresden, Germany May 7, 2014.

14. "Probing the A1 to $L1_0$ Transformation in FeCuPt Using the First Order Reversal Curve Method" **Dustin A. Gilbert**, Jung-Wei Liao, Liang-Wei Wang, Chih-Huang Lai, Timothy Klemmer, Jan-Ulrich Thiele, Kai Liu, 2014 IEEE International Magnetics Conference, Intermag, Dresden, Germany May 5, 2014.

15. "Quantitative Decoding of Interactions in Tunable Nanomagnet Arrays Using First Order Reversal Curves" **D.A. Gilbert**, G.T. Zimanyi, R.K. Dumas, M. Winklhofer, A. Gomez, N. Eibagi, J.L. Vincent, and Kai Liu, MMM 2013, Denver, CO, November 8, 2013.

16. "Multiple Phased Gd_xFe_{1-x}/NiCoO Thin Films with Field-Tunable Exchange Bias", **Dustin A. Gilbert**, Justin Olamit, Randy K. Dumas, Elke Arenholz, Kai Liu, MMM 2013, Denver, CO, November 5, 2013.

17. "Tilted vortex and mixed reversal modes in exchange biased nano-dots and nano-ellipses" **Dustin A. Gilbert**, Li Ye, Kai Liu, A. Varea, S. Agramunt-Puig, N. del Valle, C. Navau, A. Sánchez, J.F. Lopez-Barbera, Kristen S. Buchanan, Axel Hoffmann, Jordi Sort, Josep Nogues MMM 2013, Denver, CO, November 7, 2013.

18. "Tuning magnetic anisotropy in (001) oriented L10 $(Fe_{1-x}Cu_x)_{55}Pt_{45}$ films" **Dustin Gilbert**,* Liang-Wei Wang, Timothy Klemmer, Jan-Ulrich Thiele, Chih-Huang Lai, Kai Liu, American Physical Society Far West Section Meeting, Sonoma, CA, November 2, 2013.

    ***Received Margaret Burbidge award for Best Experimental Research by a Graduate Student.**

19. "Tailoring anisotropy in (001) oriented $(Fe_{1-x}Cu_x)_{55}Pt_{45}$ films" **Dustin Gilbert**, Liang-Wei Wang, Timothy Klemmer, Jan-Ulrich Thiele, Chih-Huang Lai, Kai Liu, American Physical Society March Meeting 2013, Baltimore, MD, March 19, 2013.

20. "Magnetization Reversal in Graded Anisotropy Co/Pd Nanodots" **Dustin A.Gilbert**, Peter K. Greene, Chih-Huang Lai, Kai Liu, MMM 2011, Scottsdale, AZ, November 2, 2013.

21. "Probing magnetic configurations and interactions in embedded multilayered Co/Pd nanowires" **D.A. Gilbert**, K. Liu, INTERMAG 2011, in Taipei, Taiwan, April, 28, 2011.

22. "Fingerprinting Inhomogeneities in Magnetic Recording Media using the First Order Reversal Curve Method" B.F. Valcu, **D.A. Gilbert**, K. Liu, INTERMAG 2011, in Taipei, Taiwan, April, 27, 2011.

23. "Quantitative evaluation of magnetic interactions in arrays of elliptical nanomagnets" **D.A. Gilbert**, R.K. Dumas, Michael Winklhofer, N. Eibagi, K. Liu, 55th Annual Magnetism and Magnetic Materials (MMM) conference, 2010, Atlanta, GA, November 17, 2010.

24. "Chirality control via double-vortex nucleation and coalescence in asymmetric Co dots" **D.A. Gilbert**, R.K. Dumas, N. Eibagi, K. Liu, 55th Annual Magnetism and Magnetic Materials (MMM) conference, 2010, Atlanta, GA, November 17, 2010.

25. "Design, Modeling, Construction and Testing of a One Meter Parallel Rail Accelerator", **Dustin Gilbert**, Dave Belanger, Poster Presentation, Jack Baskin Undergraduate Research Poster Symposium, University of California at Santa Cruz, Santa Cruz, CA, June 05, 2008.

26. "Design, Modeling, Construction and Testing of a One Meter Parallel Rail Accelerator", **Dustin Gilbert**, Dave Belanger, Society of Physics Students Regional Zone (18) Meeting – CA, NV, HI - University of California at Santa Cruz, Santa Cruz, CA, May 03, 2008.