

Publication List

Laura Heyderman, October 2023

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Mesoscopic Systems 2013-present

2023

1. *Electrically programmable magnetic coupling in an Ising network exploiting solid-state ionic gating*
C. Yun, Z. Liang, A. Hrabec, Z. Liu, M. Huang, L. Wang, Y. Xiao, Y. Fang, W. Li, W. Yang, Y. Hou, J. Yang, **L.J. Heyderman**, P. Gambardella, Z. Luo
Nature Communications 14, 6367 (2023)
2. *Effect of periodicity on the magnetic anisotropy in spinel oxide superlattices*
F. Motti, L.J. Riddiford, D. Vaclavkova, S. Sahoo, A. Milenko Müller, C. Vockenhuber, A. Baghi Zadeh, C. Piamonteze, C. Schneider, V. Scagnoli, **L.J. Heyderman**
Phys. Rev. B 108, 104426 (2023)
3. *Long-range order in arrays of composite and monolithic magnetotoroidal moments*
J. Lehmann, N. Leo, **L.J. Heyderman**, M. Fiebig
Phys. Rev. B 108, 104405 (2023)
4. *Strong lateral exchange coupling and current-induced switching in single-layer ferrimagnetic films with patterned compensation temperature*
Z. Liu, Z. Luo, I. Shorubalko, C. Vockenhuber, **L.J. Heyderman**, P. Gambardella, A. Hrabec
Phys. Rev. B 107, L100412 (2023) **Editor's Suggestion**
5. *Stabilising transient ferromagnetic states in nanopatterned FeRh with shape-induced anisotropy*
M. Grimes, V. Szgari, S. Parchenko, J. Zhou, Y. Soh, **L.J. Heyderman**, T. Thomson, V. Scagnoli
J. Phys. D: Appl. Phys. 56, 485002 (2023)

2022

6. *Real-space imaging of phase transitions in bridged artificial kagome spin ice*
K. Hofhuis, S. Skjærvø, S. Parchenko, H. Arava, Z. Luo, A. Kleibert, P.M. Derlet, **L.J. Heyderman**
Nature Physics 18, 699 (2022)
Associated Article: Susan Kempinger, Long-range order seen at last, News & Views, Nature Physics 18, 608 (2022)
Press Release: A look into the magnetic future ([PSI Press Release](#) and [ETH News](#))
Media Coverage: [The Register](#)
7. *Geometrical control of disorder-induced magnetic domains in planar synthetic antiferromagnets*
K. Hofhuis, X. Wang, A. Hrabec, Z. Luo, Z. Liu, P. Gambardella, P.M. Derlet, **L.J. Heyderman**
Phys. Rev. Mater. 6, L033001 (2022)
8. *Spin ice devices from nanomagnets*
L.J. Heyderman
News & Views, Nature Nanotechnology 17, 435 (2022)
9. *X-ray imaging of the magnetic configuration of a three-dimensional artificial spin ice building block*
P. Pip, S. Treves, J. Massey, S. Finizio, Z. Luo, A. Hrabec, V. Scagnoli, J. Raabe, L. Philippe, **L.J. Heyderman**, C. Donnelly
APL Mater. 10, 101101 (2022)
10. *Precessional dynamics of geometrically scaled magnetostatic spin waves in two-dimensional magnonic fractals*
J. Zhou, M. Zelent, S. Parchenko, Z. Luo, V. Scagnoli, M. Krawczyk, **L.J. Heyderman**, S. Saha
Phys. Rev. B 105, 174415 (2022)

11. *Determination of sub-ps lattice dynamics in FeRh thin films*
M. Grimes, H. Ueda, D. Ozerov, F. Pressacco, S. Parchenko, A. Apseros, M. Scholz, Y. Kubota, T. Togashi, Y. Tanaka, **L.J. Heyderman**, T. Thomson, V. Scagnoli
Scientific Reports 12, 8584 (2022)
 12. *X-ray investigation of long-range antiferromagnetic ordering in FeRh*
M. Grimes, N. Gurung, H. Ueda, D.G. Porter, B. Pedrini, **L.J. Heyderman**, T. Thomson, V. Scagnoli
AIP Advances 12, 035048 (2022) **One of the most downloaded papers from the 15th Joint MMM-Intermag Conference**
- 2021**
13. *Direct observation of spin correlations in an artificial triangular lattice Ising spin system with grazing-incidence small-angle neutron scattering*
P. Pip, A. Glavic, S.H. Skjærvø, A. Weber, A. Smerald, K. Zhernenkov, N. Leo, F. Mila, L. Philippe, **L.J. Heyderman**
Nanoscale Horizons 6, 474 (2021)
 14. *Field- and Current-Driven Magnetic Domain-Wall Inverter and Diode*
Z. Luo, S. Schären, A. Hrabec, T.P. Dao, G. Sala, S. Finizio, J. Feng, S. Mayr, J. Raabe, P. Gambardella, **L.J. Heyderman**
Phys. Rev. Applied 15, 034077 (2021) **Editor's Suggestion**
 15. *Mesoscopic magnetic systems: from fundamental properties to devices*
L.J. Heyderman, J. Grollier, C.H. Marrows, P. Vavassori, D. Grundler, D. Makarov, S. Pané
Appl. Phys. Lett. 119, 080401 (2021) [APL Special Topic](#) **Guest Editorial & Featured Article**
 16. *Experimental observation of vortex rings in a bulk magnet*
C. Donnelly, K.L. Metlov, V. Scagnoli, M. Guizar-Sicairos, M. Holler, N.S. Bingham, J. Raabe, **L.J. Heyderman**, N.R. Cooper, S. Gliga
Nature Physics 17, 316 (2021)
Highlight in Nature Review Physics: [Stable magnetic vortices](#)
Swiss Light Source Highlight: [Magnetic vortices come full circle](#)
Swiss Physical Society: [Magnetic vortices: into the third dimension](#), C. Donnelly, K.L. Metlov, V. Scagnoli, M. Guizar-Sicairos, M. Holler, N.S. Bingham, J. Raabe, **L.J. Heyderman**, N.R. Cooper, S. Gliga, SPG Mitteilungen 65, Progress in Physics (85) (2021)
 17. *Spin-Wave Dynamics and Symmetry Breaking in an Artificial Spin Ice*
S. Saha, J. Zhou, K. Hofhuis, A. Kákay, V. Scagnoli, **L.J. Heyderman**, S. Gliga
Nano Letters 21, 2382 (2021)
 18. *Spin-Wave Emission from Vortex Cores under Static Magnetic Bias Fields*
S. Mayr, L. Flajšman, S. Finizio, A. Hrabec, M. Weigand, J. Förster, H. Stoll, **L.J. Heyderman**, M. Urbánek, S. Wintz, J. Raabe
Nano Letters 21, 1584 (2021)
 19. *Artificial out-of-plane Ising antiferromagnet on the kagome lattice with very small farther neighbor couplings*
J. Colbois, K. Hofhuis, Z. Luo, X. Wang, A. Hrabec, **L.J. Heyderman**, F. Mila
Phys. Rev. B 104, 024418 (2021)
 20. *Synchronization of chiral vortex nano-oscillators*
Z. Zeng, Z. Luo, **L.J. Heyderman**, J.-V. Kim, A. Hrabec
Appl. Phys. Lett. 118, 222405 (2021)
 21. *Engineering of intrinsic chiral torques in magnetic thin films based on the Dzyaloshinskii-Moriya interaction*
Z. Liu, Z. Luo, S. Rohart, **L.J. Heyderman**, P. Gambardella, A. Hrabec
Phys. Rev. Appl. 16, 054049 (2021)
 22. *Route to Tunable Room Temperature Electric Polarization in SrTiO₃-CoFe₂O₄ Heterostructures*
L. Maurel, J. Herrero-Martín, F. Motti, H.B. Vasili, C. Piamonteze, **L.J. Heyderman**, V. Scagnoli
J. Mater. Chem. C 9, 5977 (2021)

2020

23. *Current-driven magnetic domain-wall logic*
Z. Luo, A. Hrabec, T. Phuong Dao, G. Sala, S. Finizio, J. Feng, S. Mayr, J. Raabe, P. Gambardella, **L.J. Heyderman**
Nature 579, 214 (2020)
Associated Articles:
See-Hun Yang, An electrically operated magnetic logic gate, News & Views, Nature 579, 201 (2020)
P. Gambardella, Z. Luo, **L.J. Heyderman**, Magnetic logic driven by electric current, Physics Today 74, 62 (2021)
ETH News: [Combining magnetic data storage and logic](#)
24. *Advances in Artificial Spin Ice*
S.H. Skjærvø, C.H. Marrows, R.L. Stamps, **L.J. Heyderman**
Nature Reviews Physics 2, 13 (2020)
25. *Time-resolved imaging of three-dimensional nanoscale magnetization dynamics*
C. Donnelly, S. Finizio, S. Gliga, M. Holler, A. Hrabec, M. Odrščil, S. Mayr, V. Scagnoli, **L.J. Heyderman**,
M. Guizar-Sicairos, J. Raabe
Nature Nanotechnology, 15, 356 (2020) with [Cover Image](#)
Press Releases: Short film of a magnetic nano-vortex ([PSI](#)); Watching magnetic nano ‘tornadoes’ in 3D ([University of Cambridge](#)); **Further Media Coverage:** [Physics World](#)
26. *Relation between microscopic interactions and macroscopic properties in ferroics*
J. Lehmann, A. Bortis, P.M. Derlet, C. Donnelly, N. Leo, **L.J. Heyderman**, M. Fiebig
Nature Nanotechnology 2020, 15, 896 (2020)
27. *Thermally superactive artificial kagome spin ice structures obtained with the interfacial Dzyaloshinskii-Moriya interaction*
K. Hofhuis, A. Hrabec, H. Arava, N. Leo, Y-L Huang, R.V. Chopdekar, S. Parchenko, A. Kleibert, S. Koraltan, C. Abert,
C. Vogler, D. Suess, P.M. Derlet, **L.J. Heyderman**
Phys. Rev. B 102, 180405(R) (2020)
28. *Electroless Deposition of Ni–Fe Alloys on Scaffolds for 3D Nanomagnetism*
P. Pip, C. Donnelly, M. Döbeli, C. Gunderson, **L.J. Heyderman**, L. Philippe
Small 16, 2004099 (2020)
29. *Switchable adhesion of soft composites induced by a magnetic field*
P. Testa, B. Chappuis, S. Kistler, R.W. Style, **L.J. Heyderman**, E.R. Dufresne
Soft Matter 16, 5806 (2020)
30. *Synthetic chiral magnets promoted by the Dzyaloshinskii–Moriya interaction*
A. Hrabec, Z. Luo, **L.J. Heyderman**, P. Gambardella
Appl. Phys. Lett. 117, 130503 (2020) **Editor’s Pick**
31. *Control of emergent magnetic monopole currents in artificial spin ice*
H. Arava, E. Y. Vedmedenko, J. Cui, J. Vijayakumar, A. Kleibert, **L.J. Heyderman**
Phys. Rev. B 102, 144413 (2020)
32. *Ultrafast laser induced precessional dynamics in antiferromagnetically coupled ferromagnetic thin films*
J. Zhou, S. Saha, Z. Luo, E. Kirk, V. Scagnoli, **L.J. Heyderman**
Phys. Rev. B 101, 214434 (2020)
33. *Anisotropy-induced spin reorientation in chemically modulated amorphous ferrimagnetic films*
E. Kirk, C. Bull, S. Finizio, H. Sepehri-Amin, S. Wintz, A.K. Suszka, N.S. Bingham, P. Warnicke, K. Hono, P.W. Nutter,
J. Raabe, G. Hrkac, T. Thomson, **L.J. Heyderman**
Phys. Rev. Materials 4, 074403 (2020)
34. *Control of damping in perpendicularly magnetized thin films using spin-orbit torques*
S. Saha, P. Flauger, C. Abert, A. Hrabec, Z. Luo, J. Zhou, V. Scagnoli, D. Suess, **L.J. Heyderman**
Phys. Rev. B 101, 224401 (2020)

35. *Controlled motion of skyrmions in a magnetic antidot lattice*
J. Feilhauer, S. Saha, J. Tobik, M. Zelent, **L.J. Heyderman**, M. Mruczkiewicz
Phys. Rev. B 102, 184425 (2020)
36. *Evolution of field-induced metastable phases in the Shastry-Sutherland lattice magnet TmB_4*
D. Lançon, V. Scagnoli, U. Staub, O. A. Petrenko, M. Ciomaga Hatnean, E. Canevet, R. Sibille, S. Francoual, J.R.L. Mardegan, K. Beauvois, G. Balakrishnan, **L.J. Heyderman**, Ch. Rüegg, and T. Fennell
Phys. Rev. B 102, 060407(R) (2020)
- 2019**
37. *Nanomagnetic encoding of shape-morphing micromachines*
J. Cui, T.-Y. Huang, Z. Luo, P. Testa, H. Gu, X.-Z. Chen, B.J. Nelson, **L.J. Heyderman**
Nature 575, 164 (2019)
Associated Article: X. Zhao & Y. Kim, Soft microbots controlled by nanomagnets, News & Views, Nature 575, 58 (2019)
Press Releases: On the way to intelligent microrobots ([PSI](#)); Flying by magnetism ([ETH News](#))
Further Media Coverage: [Physics World](#), [Chemical & Engineering News](#), [Yahoo Finance Video](#)
38. *Chirally coupled nanomagnets*
Z. Luo, T. Phuong Dao, A. Hrabec, J. Vijayakumar, A. Kleibert, M. Baumgartner, E. Kirk, J. Cui, T. Savchenko, G. Krishnaswamy, **L.J. Heyderman**, P. Gambardella
Science 363, 1435 (2019)
Press Release: A compass pointing West ([PSI](#) and [ETH News](#))
Lead: [Magnetic building blocks in two dimensions](#) by Jelena Stajic
Article in MRS Bulletin: [Strong chiral coupling of adjacent nanomagnets achieved](#) by Eva Karatairi (2019)
Swiss Physical Society: [Chiral Twist in mesoscopic magnetic systems](#), A. Hrabec, Z. Luo, T.P. Dao, P. Gambardella, **L.J. Heyderman**, SPG Mitteilungen 59, Progress in Physics (70) (2019)
39. *Magnetically Addressable Shape-Memory and Stiffening in a Composite Elastomer*
P. Testa, R.W. Style, J. Cui, C. Donnelly, E. Borisova, P.M. Derlet, E.R. Dufresne, **L.J. Heyderman**
Advanced Materials 1900561, 31 (2019) with [Cover Image](#)
PSI Press Release: [New material with magnetic shape memory](#)
Article in Materials Today: [Magnetic shape-memory material holds great promise](#)
40. *Poling of an artificial magneto-toroidal crystal*
J. Lehmann, C. Donnelly, P.M. Derlet, **L.J. Heyderman**, M. Fiebig
Nature Nanotechnology 14, 141 (2019)
Department of Materials News, ETH Zurich: [Swirling Magnetic Order in Artificial Crystals](#)
41. *Engineering Relaxation Pathways in Building Blocks of Artificial Spin Ice for Computation*
H. Arava, N. Leo, D. Schildknecht, J. Cui, J. Vijayakumar, P. M. Derlet, A. Kleibert, **L.J. Heyderman**
Phys. Rev. Applied 11, 054086 (2019) **Editor's Suggestion**
42. *Continuous magnetic phase transition in artificial square ice*
O. Sendetskyi, V. Scagnoli, N. Leo, L. Anghinolfi, A. Alberca, J. Lüning, U. Staub, P.M. Derlet, **L.J. Heyderman**
Phys. Rev. B 99, 214430 (2019) **Editor's Suggestion**
43. *Formation of Néel-type skyrmions in an antidot lattice with perpendicular magnetic anisotropy*
S. Saha, M. Zelent, S. Finizio, M. Mruczkiewicz, S. Tacchi, A.K. Suszka, S. Wintz, N.S. Bingham, J. Raabe, M. Krawczyk, **L.J. Heyderman**
Phys. Rev. B 100, 144435 (2019)
44. *Chiral domain wall injector driven by spin-orbit torques*
T.P. Dao, M. Müller, Z. Luo, M. Baumgartner, A. Hrabec, **L.J. Heyderman**, P. Gambardella
Nano Lett. 19, 5930 (2019)

45. *Continuous ground-state degeneracy of classical dipoles on regular lattices*
D. Schildknecht, M. Schütt, P.M. Derlet, **L.J. Heyderman**
Phys. Rev. B 100, 014426 (2019)
46. *Characterisation of Size Distribution and Positional Misalignment of Nanoscale Islands by Small-Angle X-ray Scattering*
G. Heldt, P. Thompson, R.V. Chopdekar, J. Kohlbrecher, S. Lee, **L.J. Heyderman**, T. Thomson
J. Appl. Phys. 125, 014301 (2019)
- 2018**
47. *Collective magnetism in an artificial 2D XY spin system*
N. Leo, S. Holenstein, D. Schildknecht, O. Sendetskyi, H. Luetkens, P.M. Derlet, V. Scagnoli, D. Lançon, J.R.L. Mardegan, T. Prokscha, A. Suter, Z. Salman, S. Lee, **L.J. Heyderman**
Nature Communications 9, 2850 (2018)
48. *Computational logic with square rings of nanomagnets*
H. Arava, P. M. Derlet, J. Vijayakumar, J. Cui, N.S. Bingham, A. Kleibert, **L.J. Heyderman**
Nanotechnology 29, 265205 (2018)
49. *Phase diagram of dipolar-coupled XY moments on disordered square lattices*
D. Schildknecht, **L.J. Heyderman**, P.M. Derlet
Phys. Rev. B 98, 064420 (2018)
50. *Tomographic reconstruction of a three-dimensional magnetization vector field*
C. Donnelly, S. Gliga, V. Scagnoli, M. Holler, J. Raabe, **L.J. Heyderman** and M. Guizar-Sicairos
New J. Phys. 20, 083009 (2018)
51. *Observation of the out-of-plane magnetization in a mesoscopic ferromagnetic structure superjacent to a superconductor*
A.K. Suszka, S. Gliga, P. Warnicke, S. Wintz, S. Saha, K.M. Charipar, H. Kim, P. Wohlhüter, E. Kirk, S. Finizio, J. Raabe, J.D.S. Witt, **L.J. Heyderman**, N.S. Bingham
Appl. Phys. Lett. 113, 162601 (2018)
52. *Direct observation of electron density reconstruction at the metal-insulator transition in NaOsO₃*
N. Gurung, N. Leo, S.P. Collins, G. Nisbet, G. Smolentsev, M. García-Fernández, K. Yamaura, **L.J. Heyderman**, U. Staub, Y. Joly, D.D. Khalyavin, S.W. Lovesey, V. Scagnoli
Phys. Rev. B 98, 115116 (2018)
53. *Generation of coherent extreme ultraviolet radiation from α -quartz using 50 fs laser pulses at a 1030 nm wavelength and high repetition rates*
T.T. Luu, V. Scagnoli, S. Saha, **L.J. Heyderman**, H.J. Wörner
Opt. Lett. 43, 1790 (2018)

2017

54. *Three-dimensional magnetization structures revealed with X-ray vector nanotomography*
C. Donnelly, M. Guizar-Sicairos, V. Scagnoli, S. Gliga, M. Holler, J. Raabe, **L.J. Heyderman**
Nature 547, 328 (2017)

Associated Articles:

- P. Fischer, 'X-rays used to watch spins in 3D', News & Views, Nature 547, 290 (2017)
M. Beckers, 'Einblick ins Innere eines Magneten', Spektrum der Wissenschaft, October 2017
J.L. Miller, 'X rays peer inside a magnet', Physics Today 70, 9, 17 (2017)
C. Donnelly, **L.J. Heyderman**, S. Gliga, M. Guizar-Sicairos, 'Röntgenblick für Magnete' Phys. Unserer Zeit 6, 266, 2017
C. Donnelly, V. Scagnoli, **L.J. Heyderman**, M. Guizar-Sicairos, M. Holler, J. Raabe, S. Gliga, 'Hard-X-Ray Magnetic Tomography' Optics & Photonics News, December 2017
PSI Press Release: [Diving into magnets](#). Further Media Coverage: [Physics World](#), [MRS Bulletin](#), [Forbes](#)

55. *Emergent dynamic chirality in a thermally driven artificial spin ratchet*
S. Gliga, G. Hrkac, C. Donnelly, J. Büchi, A. Kleibert, J. Cui, A. Farhan, E. Kirk, R.V. Chopdekar, Y. Masaki, N.S. Bingham, A. Scholl, R.L. Stamps, **L.J. Heyderman**
Nature Materials 16, 1106 (2017)
Associated Articles:
S. Bramwell, 'Artificial spin ice: A ratchet made of tiny magnets', News & Views, Nature Materials 1053, 16 (2017)
PSI Scientific Highlight: [Magnetic structures take a new turn](#)
Press Releases: Scientists create magnetic system that transforms heat into motion [Univ. of Glasgow](#) & [Univ. of Exeter](#)
Nature Research Highlight 2017: [Nanoscale ratchet is driven by heat](#)
56. *Magnetic charge and moment dynamics in artificial kagome spin ice*
A. Farhan, P.M. Derlet, L. Anghinolfi, A. Kleibert, **L.J. Heyderman**
Phys. Rev. B 96, 064409 (2017)
57. *Interfacial room temperature magnetism and enhanced magnetocaloric effect in strained $\text{La}_{0.66}\text{Ca}_{0.34}\text{MnO}_3/\text{BaTiO}_3$ heterostructures*
N.S. Bingham, A.K. Suszka, C.A.F. Vaz, H. Kim, **L.J. Heyderman**
Phys. Rev. B 96, 024419 (2017)
58. *Tunable magnetic vortex resonance in a potential well*
P. Warnicke, P. Wohlhüter, A. K. Suszka, S.E. Stevenson, **L.J. Heyderman**, J. Raabe
Phys. Rev. B 96, 024419 (2017)
59. *Vortex motion in amorphous ferrimagnetic thin film elements*
H. Oezelt, E. Kirk, P. Wohlhüter, E. Müller, **L.J. Heyderman**, A. Kovacs, T. Schrefl
AIP Advances 7, 056001 (2017)
- 2016**
60. *Nanoparticle-Based Magnetoelectric $\text{BaTiO}_3\text{-CoFe}_2\text{O}_4$ Thin Film Heterostructures for Voltage Control of Magnetism*
D. Erdem, N.S. Bingham, F.J. Heiligttag, N. Pilet, P. Warnicke, C.A.F. Vaz, Y. Shi, M. Buzzi, J.L.M. Rupp, **L.J. Heyderman** and M. Niederberger
ACS Nano 10, 9840 (2016)
61. *High resolution hard x-ray magnetic imaging with dichroic ptychography*
C. Donnelly, V. Scagnoli, M. Guizar-Sicairos, M. Holler, F. Wilhelm, F. Guillou, A. Rogalev, C. Detlefs, A. Menzel, J. Raabe, **L.J. Heyderman**
Phys. Rev. B 94, 064421 (2016)
62. *Magnetic diffuse scattering in artificial kagome spin ice*
O. Sendetskyi, L. Anghinolfi, V. Scagnoli, G. Möller, N. Leo, A. Alberca, J. Kohlbrecher, J. Lüning, **L.J. Heyderman**
Phys. Rev. B 93, 224413 (2016) **Editor's Suggestion (approx. 5% of published manuscripts)**
63. *CoFe_2O_4 and $\text{CoFe}_2\text{O}_4\text{-SiO}_2$ Nanoparticle Thin Films with Perpendicular Magnetic Anisotropy for Magnetic and Magneto-Optical Applications*
D. Erdem, N.S. Bingham, F.J. Heiligttag, N. Pilet, P. Warnicke, **L.J. Heyderman**, M. Niederberger
Adv. Funct. Mater. 26, 1954 (2016)
64. *Complex spin configurations in hybrid magnetic multilayer structures due to mutual spin imprinting*
M.T. Bryan, G. Heldt, T. Thomson, **L.J. Heyderman**, G. Hrkac
Phys. Rev. B 94, 104415 (2016)
65. *Magnetic Phases of Sputter Deposited Thin-Film Erbium*
J.D.S. Witt, J.F.K. Cooper, N. Satchell, C. J. Kinane, P.J. Curran, S. J. Bending, S. Langridge, **L.J. Heyderman**, G. Burnell
Scientific Reports 6, 39021 (2016)
66. *Switching field distribution of exchange coupled ferri-/ferromagnetic composite bit patterned media*
H. Oezelt, A. Kovacs, J. Fischbacher, P. Matthes, E. Kirk, P. Wohlhüter, **L.J. Heyderman**, M. Albrecht, T. Schrefl
J. Appl. Phys. 120, 093904 (2016)

2015

67. *Thermodynamic phase transitions in a frustrated magnetic metamaterial*
L. Anghinolfi, H. Luetkens, J. Perron, M.G. Flokstra, O. Sendetskiy, A. Suter, T. Prokscha, P.M. Derlet, S.L. Lee and **L.J. Heyderman**
Nature Communications 6, 8278 (2015)
PSI Press Release: [Tiny magnets mimic steam, water and ice](#)
Media Coverage: [Yale Scientific](#), [IFL Science](#)
68. *Nanoscale switch for vortex polarization mediated by Bloch core formation in magnetic hybrid systems*
P. Wohlhüter, M.T. Bryan, P. Warnicke, S. Gliga, S.E. Stevenson, G. Heldt, L. Saharan, A. Kinga Suszka, C. Moutafis, R.V. Chopdekar, J. Raabe, T. Thomson, G. Hrkac, **L.J. Heyderman**
Nature Communications 6, 7836 (2015)
Media Coverage: [Mikroskopischer Magnetisierungsschalter](#) at pro-physik.de, September 2015
YouTube animation: [Local control of vortex core reversal in a magnetic hybrid system](#)
69. *Element-Specific X-Ray Phase Tomography of 3D Structures at the Nanoscale*
C. Donnelly, M. Guizar-Sicairos, V. Scagnoli, M. Holler, T. Huthwelker, A. Menzel, I. Vartiainen, E. Müller, E. Kirk, S. Gliga, J. Raabe, **L.J. Heyderman**
Phys. Rev. Lett. 114, 115501 (2015)
PSI Press release: [Nanometres in 3D](#)
70. *Broken vertex symmetry and finite zero-point entropy in the artificial square ice ground state*
S. Gliga, A. Kákay, **L.J. Heyderman**, R. Hertel, O. G. Heinonen
Phys. Rev. B 92, 060413(R) (2015)
71. *Micromagnetic simulation of exchange coupled ferri-/ferromagnetic composite in bit patterned media*
H. Oezelt, A. Kovacs, P. Wohlhüter, E. Kirk, D. Nissen, P. Matthes, **L.J. Heyderman**, M. Albrecht, T. Schrefl
J. Appl. Phys. 117, 17E501 (2015)

2014

72. *Thermal fluctuations in artificial spin ice*
V. Kapaklis, U.B. Arnalds, A. Farhan, R.V. Chopdekar, A. Balan, A. Scholl, **L.J. Heyderman**, B. Hjörvarsson
Nature Nanotechnology 9, 514 (2014) **appeared in Advanced Light Source News**
73. *Topologically confined vortex oscillations in hybrid [Co/Pd]₈-Permalloy structures*
G. Heldt, M.T. Bryan, G. Hrkac, S.E. Stevenson, R.V. Chopdekar, J. Raabe, T. Thomson, **L.J. Heyderman**
Appl. Phys. Lett. 104, 182401 (2014) with [Cover Image](#)
74. *Thermally Induced Magnetic Relaxation in Building Blocks of Artificial Kagome Spin Ice*
A. Farhan, A. Kleibert, P.M. Derlet, L. Anghinolfi, A. Balan, R.V. Chopdekar, M. Wyss, S. Gliga, F. Nolting, **L.J. Heyderman**
Phys. Rev. B 89, 214405 (2014)
75. *Focus on artificial frustrated systems*
J. Cumings, **L.J. Heyderman**, C.H. Marrows, R.L. Stamps
New J. Phys. 16, 075016 (2014) – **Editorial**

2013

76. *Artificial ferroic systems: novel functionality from structure, interactions and dynamics*
L.J. Heyderman and R.L. Stamps
J. Phys.: Condens. Matter 25, 363201 (2013) - **Topical Review**

77. *Exploring hyper-cubic energy landscapes in thermally active finite artificial spin ice systems*
A. Farhan, P.M. Derlet, A. Kleibert, A. Balan, R.V. Chopdekar, M. Wyss, L. Anghinolfi, F. Nolting, **L.J. Heyderman**
Nature Physics 9, 375 (2013)
Associated Article: C. Marrows in News & Views section of Nature Physics, 9, 324 (2013)
PSI Press Release: [Tiny Magnets as a Model System](#)
78. *Direct Observation of Thermal Relaxation in Artificial Spin Ice*
A. Farhan, P.M. Derlet, A. Kleibert, A. Balan, R.V. Chopdekar, M. Wyss, J. Perron, A. Scholl, F. Nolting and **L.J. Heyderman**
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79. *Crystal-clear order*
L.J. Heyderman
News & Views, Nature Nanotechnology 8, 705 (2013)
80. *Extended reciprocal space observation of artificial spin ice with x-ray magnetic resonant scattering*
J. Perron, L. Anghinolfi, B. Tudu, N. Jaouen, J.-M. Tonnerre, M. Sacchi, F. Nolting, J. Lüning, **L.J. Heyderman**
Phys. Rev. B 88, 214424 (2013)
Editor's Suggestion (approx. 5% of published manuscripts) and Synchrotron SOLEIL highlight
81. *Single domain spin manipulation by electric fields in strain coupled artificial multiferroic nanostructures*
M. Buzzi, R.V. Chopdekar, J. L. Hockel, A. Bur, T. Wu, N. Pilet, P. Warnicke, G.P. Carman, **L.J. Heyderman**, F. Nolting
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82. *Controlling vortex chirality in hexagonal building blocks of artificial spin ice*
R.V. Chopdekar, G. Duff, R.V. Hügli, E. Mengotti, D. A. Zanin, **L.J. Heyderman**, H.B. Braun
New J. Phys. 15, 125033 (2013) with **Video Abstract**
83. *Dynamic stabilization of nonequilibrium domain configurations in magnetic squares with high amplitude excitations*
S.E. Stevenson, C. Moutafis, G. Heldt, R.V. Chopdekar, C. Quitmann, **L.J. Heyderman**, J. Raabe
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84. *Strain-dependent magnetic configurations in manganite-titanate heterostructures probed with soft X-ray techniques*
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European Physical Journal B 86, 241 (2013)
85. *The effect of magnetic anisotropy on the spin configurations of patterned $La_{0.7}Sr_{0.3}MnO_3$ elements*
P. Wohlhüter, J. Rhensius, C.A.F. Vaz, J. Heidler, H.S. Körner, A. Bisig, M. Foerster, L. Méchin, F. Gaucher, A. Locatelli, M.A. Nino, S. El Moussaoui, F. Nolting, E. Goering, **L.J. Heyderman**, M. Kläui
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87. *Domain-Wall Induced Large Magnetoresistance Effects at Zero Applied Field in Ballistic Nanocontacts*
A. von Bieren, A.K. Patra, S. Krzyk, J. Rhensius, R.M. Reeve, **L.J. Heyderman**, R. Hoffmann-Vogel, M. Kläui
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90. *Thermalized ground state of artificial kagome spin ice building blocks*
U. B. Arnalds, A. Farhan, R.V. Chopdekar, V. Kapaklis, A. Balan, E.Th. Papaioannou, M. Ahlberg, F. Nolting, **L.J. Heyderman**, B. Hjörvarsson
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L. Le Guyader, S. El Moussaoui, M. Buzzi, R.V. Chopdekar, **L.J. Heyderman**, A. Tsukamoto, A. Itoh, A. Kirilyuk, Th. Rasing, A. V. Kimel, F. Nolting
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Associated Media Articles:
L. Heyderman, F. Nolting & H.-B. Braun, 'Monopole aus Nanomagneteten', Spektrum der Wissenschaft, March 2011
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M. Shalaby, H. Merbold, M. Peccianti, L. Razzari, G. Sharma, T. Ozaki, R. Morandotti, T. Feurer, A. Weber, **L. Heyderman**, B. Patterson, H. Sigg
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108. *Magnetic-field-induced domain-wall motion in permalloy nanowires with modified Gilbert damping*
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