Michael Alan McGuire

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Research Interests

Magnetic, thermoelectric, and superconducting materials; cleavable materials; solid state chemistry and crystal growth of complex and new inorganic compounds; magnetic, thermal, and transport properties; crystallography and structure-property relationships.

Education

2001 – 2006	**Cornell University**	**Ph.D. Physics**
1999 – 2001	**University of Mississippi**	**M.S. Physics**
1995 – 1999	**University of Mississippi**	**B.S. Physics**

Research Experience

2007 – present **Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN**
Senior R&D Staff and Eugene P. Wigner Fellow, Correlated Electron Materials Group

2006 – 2007 **Department of Chemistry, Princeton University, Princeton, NJ**
Postdoctoral Research Associate

2002 – 2006 **Department of Chemistry and Chemical Biology, Cornell University, Ithaca, NY**
Graduate Research Assistant
▪ Dissertation: "*Exploring Thallium Compounds, Chevrel Phases, and Other Chalcogenides as Thermoelectric Materials*"

2000 – 2001 **Department of Physics and Astronomy, University of Mississippi, Oxford, MS**
Graduate Research Assistant
▪ Thesis: "*Resonant Ultrasound Spectroscopy Studies of Clathrate Thermoelectrics*"

Fellowships, Memberships, and Awards

Fellow of the American Association for the Advancement of Science, 2020
Fellow of the American Physical Society, 2017

Member **AAAS, American Physical Society, American Crystallographic Association, American Chemical Society**

Highly Cited Researcher, Clarivate Analytics, 2019
Highly Cited Researcher, Clarivate Analytics, 2018
Excellence in Technology Transfer Award, Federal Laboratory Consortium, 2018; Southeast Region, 2017
R&D 100 Award, 2017
Highly Cited Researcher, Thompson Reuters, 2014
Significant Event Award, Oak Ridge National Laboratory, 2013
Gordon Battelle Prize, Oak Ridge National Laboratory, 2011
Directors Award for Outstanding Team Accomplishment, Oak Ridge National Laboratory, 2009
Scientific Research Team Award, Oak Ridge National Laboratory, 2009
Significant Event Award, Oak Ridge National Laboratory, 2008
Eugene P. Wigner Fellowship, Oak Ridge National Laboratory, 2007-2009
Cornell University Fellowship, Cornell University, 2001-2002
Graduate Student Achievement Award, University of Mississippi, 2001
Taylor Medal, University of Mississippi, 1999

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h-index = 53 WOS/Publons, 62 Google Scholar; ORCID

Full Publication List:

(274) X.B. Liu, M.S. Kesler, M.F. Besser, M.J. Kramer, M.A. McGuire, I.C. Nlebedim, "Effect of processing hydrogen pressure on magnetic properties of HDDR Nd-Fe-B magnet" **IEEE TRANSACTIONS ON MAGNETICS** ONLINE (2020). DOI: 10.1109/TMAG.2020.3022739

(273) L.D. Sanjeewa, Y. Liu, J. Xing, R.S. Fishman, M.T.K. Kolambage, M.A. McGuire, C.D. McMillen, J.W. Kolis, A.S. Sefat "Stacking Faults and Short-Range Magnetic Correlations in Single Crystal $Y_5Ru_2O_{12}$: A Structure with $Ru^{+4.5}$ One-Dimensional Chains" **PHYSICA STATUS SOLIDI B,** 2000197 (2020). DOI: 10.1002/pssb.202000197

(272) B. Huang, M.A. McGuire, A.F. May, D. Xiao, P. Jarillo-Herrero, X. Xu, "Emergent phenomena and proximity effects in two-dimensional magnets and heterostructures" **NATURE MATERIALS** 19, 1276 (2020). DOI: 10.1038/s41563-020-0791-8

(271) M.A. McGuire, "Cleavable magnetic materials from van der Waals layered transition metal halides and chalcogenides" **JOURNAL OF APPLIED PHYSICS** 128, 110901 (2020). DOI: 10.1063/5.0023729

(270) S.R. Singamaneni, L.M. Martinez, J. Niklas, O.G. Poluektov, R. Yadav, M. Pizzochero, O.V. Yazyev, M.A. McGuire, "Light induced electron spin resonance properties of van der Waals CrX_3 (X = Cl, I) crystals" **APPLIED PHYSICS LETTERS** 117, 082406 (2020). DOI: 10.1063/5.0010888

(269) S.M. Neumayer, L. Tao, A. O'Hara, M.A. Susner, M.A. McGuire, P. Maksymovych, S.T. Pantelides, N. Balke, "The Concept of Negative Capacitance in Ionically Conductive Van der Waals Ferroelectrics" **ADVANCED ENERGY MATERIALS** 10, 2001726 (2020). DOI: 10.1002/aenm.202001726

(268) W.R. Meier, M.-H. Du, S. Okamoto, N. Mohanta, A.F. May, M.A. McGuire, C.A. Bridges, G.D. Samolyuk, B.C. Sales, "Flat bands in CoSn-type compounds" **PHYSICAL REVIEW B** 102, 075148 (2020). DOI: 10.1103/PhysRevB.102.075148

(267) J. Cenker, B. Huang, N. Suri, P. Thijssen, A. Miller, T. Song, T. Taniguchi, K. Watanabe, M.A. McGuire, D. Xiao, X. Xu, "Direct observation of two-dimensional magnons in atomically thin CrI_3" **NATURE PHYSICS** ONLINE (2020). DOI: 10.1038/s41567-020-0999-1

(266) A.F. May, J.-Q. Yan, M.A. McGuire "A practical guide for crystal growth of van der Waals layered materials" **JOURNAL OF APPLIED PHYSICS** 128, 051101 (2020). DOI: 10.1063/5.0015971

(265) A.F. May, M.-H. Du, V.R. Cooper, M.A. McGuire, "Tuning magnetic order in the van der Waals metal Fe_5GeTe_2 by cobalt substitution" **PHYSICAL REVIEW MATERIALS** 4, 074008 (2020). DOI: 10.1103/PhysRevMaterials.4.074008

(264) S. Neumayer, J. Brehm, L. Tao, A. O'Hara, P. Ganesh, S. Jesse, M. Susner, M.A. McGuire, S. Pantelides, P. Maksymovych, N. Balke, "Local Strain and Polarization Mapping in Ferrielectric Materials" **ACS APPLIED MATERIALS & INTERFACES** 12, 38546 (2020). DOI: 10.1021/acsami.0c09246

(263) R.K. Vasudevan, S.M. Neumayer, M.A. Susner, M.A. McGuire, S.T. Pantelides, P.Maksymovych, D.N. Leonard, N. Balke, A.Y. Borisevich "Domains and Topological Defects in Layered Ferrielectric Materials: Implications for Nanoelectronics" **ACS APPLIED NANO MATERIALS** 3, 8161 (2020). DOI: 10.1021/acsanm.0c01577

(262) A. Dziaugys, K. Kelley, J.A. Brehm, L. Tao, A. Puretzky, T. Feng, A. O'Hara, S. Neumayer, M. Chysnavichyus, E.A. Eliseev, J. Banys, Y. Vysochanskii, F. Ye, B.C.Chakoumakos, M.A. Susner, M.A. McGuire, S.V. Kalinin, P. Ganesh, N. Balke, S.T. Panelides, A.N. Morozovska, P. Maksymovych "Piezoelectric domain walls in van der Waals antiferroelectric CuInP2Se6" **NATURE COMMUNICATIONS** 11, 3623 (2020). DOI: 10.1038/s41467-020-17137-0

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(260) Y. Choi, P.J. Ryan, D. Haskel, J.L. McChesney, G. Fabbris, M.A. McGuire, J.-W. Kim, "Iodine orbital moment and chromium anisotropy contributions to CrI_3 magnetism" **APPLIED PHYSICS LETTERS** 117, 022411 (2020). DOI: 10.1063/5.0012748

(259) J.Q. Yan, Y.H. Liu, D.S. Parker, Y. Wu, A.A. Aczel, M. Matsuda, M.A. McGuire, B.C. Sales "A-type antiferromagnetic order in $MnBi_4Te_7$ and $MnBi_6Te_{10}$ single crystals" **PHYSICAL REVIEW MATERIALS** 4, 054202 (2020). DOI: 10.1103/PhysRevMaterials.4.054202

(258) L.A. Boatner, B.C. Chakoumakos, S.P. Pardhasaradhi, S.N. Dryepondt, A. Shaw, J. Qu, A.E. Marquez Rossy, M.A. McGuire, J.A. Kolopus, E. Lara-Curzio, "Cryo-quenched Fe–Ni–Cr alloy decorative steel single crystals II: Alloy phases, structure, hardness, tensile, tribological, magnetic and electronic properties" **JOURNAL OF ALLOYS AND COMPOUNDS**, 835, 155169 (2020). DOI: 10.1016/j.jallcom.2020.155169

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(256) D. Zhong, K.L. Seyler, X. Linpeng, N.P. Wilson, T. Taniguchi, K. Watanabe, M.A. McGuire, K.-M.C. Fu, D. Xiao, W. Yao, X. Xu "Layer-resolved magnetic proximity effect in van der Waals heterostructures" **NATURE NANOTECHNOLOGY** 15, 187 (2020). DOI: 10.1038/s41565-019-0629-1

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(254) L.D. Sanjeewa, V.O. Garlea, R.S. Fishman, M.A. McGuire, J. Xing, H. Cao, J.W. Kolis, A.S. Sefat "Observation of a Large Magnetic Anisotropy and a Field-Induced Magnetic State in $SrCo(VO_4)(OH)$: A Structure with a Quasi One-Dimensional Magnetic Chain" **INORGANIC CHEMISTRY** 59, 1029 (2020). DOI: 10.1021/acs.inorgchem.9b02427

(253) J.A. Brehm, S.M. Neumayer, L. Tao, A. O'Hara, M. Chyasnavichus, M.A. Susner, M.A. McGuire, S.V. Kalinin, S. Jesse, P. Ganesh, S.T. Pantelides, P. Maksymovych, N. Balke "Tunable quadruple-well ferroelectric van der Waals crystals" **NATURE MATERIALS** 19, 43 (2020). DOI:10.1038/s41563-019-0532-z

(252) L.D. Sanjeewa, A.S. Sefat, M. Smart, M.A. McGuire, C.D. McMillen, J.W. Kolis, "Synthesis, structure and magnetic properties of $Ba_3M_2Ge_4O_{14}$ (M = Mn and Fe): Quasi-one-dimensional zigzag chain compounds" **JOURNAL OF SOLID STATE CHEMISTRY**, 283, 121090 (2020). DOI: 10.1016/j.jssc.2019.121090

(251) T. Song, Z. Fei, M. Yankowitz, Z. Lin, Q. Jiang, K. Hwangbo, Q. Zhang, B. Sun, T. Taniguchi, K. Watanabe, M.A. McGuire, D. Graf, T. Cao, J.-H. Chu, D.H. Cobden, C.R. Dean, D. Xiao, X. Xu, "Switching 2D magnetic states via pressure tuning of layer stacking" **NATURE MATERIALS** 18, 1298 (2019). DOI: 10.1038/s41563-019-0505-2

(250) J.-Q. Yan, W. Tian, H.B. Cao, S. Chi, F. Ye, A. Llobet, A. Puretzky, Q. Chen, J. Ma, Y. Ren, J.-G. Cheng, J.-S. Zhou, M.A. McGuire, R.J. McQueeney, "Lattice distortion in the spin-orbital entangled state in RVO_3 perovskites" **PHYSICAL REVIEW B** 100, 184423 (2019). DOI: 10.1103/PhysRevB.100.184423

(249) W.R. Meier, J. Yan, M.A. McGuire, X. Wang, A.D. Christianson, B.C. Sales, "Reorientation of antiferromagnetism in cobalt doped FeSn" **PHYSICAL REVIEW B** 100, 184421 (2019). DOI: 10.1103/PhysRevB.100.184421

(248) B.C. Sales, J.Q. Yan, W.R. Meier, A.D. Christianson, S. Okamoto, M.A. McGuire, "Electronic, magnetic, and thermodynamic properties of the kagome layer compound FeSn" **PHYSICAL REVIEW MATERIALS** 3, 114203 (2019). DOI: 10.1103/PhysRevMaterials.3.114203

(247) B.C. Sales, V.O. Garlea, M.B. Stone, M.D. Lumsden, S.E. Nagler, D. Mandrus, M.A. McGuire, "Possible observation of Kondo screening cloud in $Yb_{14}MnSb_{11}$" **PHILOSOPHICAL MAGAZINE** 100, 1204(2019). DOI: 10.1080/14786435.2019.1677958

(246) A.F. May, C.A. Bridges, M.A. McGuire, "Physical properties and thermal stability of $Fe_{5-x}GeTe_2$ single crystals" **PHYSICAL REVIEW MATERIALS** 3, 104401 (2019). DOI: 10.1103/PhysRevMaterials.3.104401

(245) J. Zhang, J. Yan, S. Calder, Q. Zheng, M.A. McGuire, D.L. Abernathy, Y. Ren, S.H. Lapidus, K. Page, H. Zheng, J.W. Freeland, J.D. Budai, R.P. Hermann, "long-Range Antiferromagnetic Order in a Rocksalt High Entropy Oxide" **CHEMISTRY OF MATERIALS** 31, 3705 (2019). DOI: 10.1021/acs.chemmater.9b00624

(244) J.Q. Yan, S. Okamoto, M.A. McGuire, A.F. May, R.J. McQueeney, B.C. Sales, "Evolution of structural, magnetic, and transport properties in $MnBi_{2-x}Sb_xTe_4$" **PHYSICAL REVIEW B** 100, 104409 (2019). DOI: 10.1103/PhysRevB.100.104409

(243) Z. Sun, Y. Yi, T. Song, G. Clark, B. Huang, Y. Shan, S. Wu, D. Huang, C. Gao, Z. Chen, M.A. McGuire, T. Cao, D. Xiao, W.-T. Liu, W. Yao, X. Xu, S. Wu "Giant nonreciprocal second-harmonic generation from antiferromagnetic bilayer CrI_3" **NATURE** 572, 497 (2019). DOI: 10.1038/s41586-019-1445-3

(242) Q. Zheng, M.A. McGuire, A.F. May "STEM Study of Structure and Local Short-Range Orders in the $Fe_{5-x}GeTe_2$ Crystals with Ferromagnetism Near Room Temperature" **MICROSCOPY AND MICROANALYSIS** 25, 956 (2019). DOI: 10.1017/S1431927619005518

(241) J.-Q. Yan, S. Okamoto, Y. Wu, Q. Zheng, H.D. Zhou, H.B. Cao, M.A. McGuire "Magnetic order in single crystals of $Na_3Co_2SbO_6$ with a honeycomb arrangement of $3d^7$ Co^{2+} ions" **PHYSICAL REVIEW MATERIALS** 3, 074405 (2019). DOI: 10.1103/PhysRevMaterials.3.074405

(240) Y.Y. Jiao, Z.Y. Liu, M.A. McGuire, S. Calder, J.-Q. Yan, B.C. Sales, J.P. Sun, Q. Cui, N.N. Wang, Y. Sui, Y. Uwatoko, B.S. Wang, X.L. Dong, J.-G. Cheng, "High-pressure phase of $CrSb_2$: A new quasi-one-dimensional itinerant magnet with competing interactions" **PHYSICAL REVIEW MATERIALS** 3, 074404 (2019). DOI: 10.1103/PhysRevMaterials.3.074404

(239) M.A. McGuire, Q. Zheng, J. Yan, B.C. Sales, "Chemical disorder and spin-liquid-like magnetism in the van der Waals layered 5d transition metal halide $Os_{0.55}Cl_2$" **PHYSICAL REVIEW B**, 99, 214402 (2019). DOI: 10.1103/PhysRevB.99.214402

(238) X. Cai, T. Song, N.P. Wilson, G. Clark, M. He, X. Zhang, T. Taniguchi, K. Watanabe, W. Yao, D. Xiao, M.A. McGuire, D.H Cobden, X. Xu, "Atomically Thin $CrCl_3$: An In-Plane Layered Antiferromagnetic Insulator" **NANO LETTERS** 19, 3993 (2019). DOI:10.1021/acs.nanolett.9b01317

(237) M.A. McGuire, T. Pandey, S. Mu, D.S. Parker, "Ferromagnetic Spin-1/2 Dimers with Strong Anisotropy in $MoCl_5$" **CHEMISTRY OF MATERIALS** 31, 2952 (2019). DOI:10.1021/acs.chemmater.9b00416

(236) C.L. Saiz, M.A. McGuire, S.R.J. Hennadige, J. van Tol, S.R. Singamaneni, "Electron Spin Resonance Properties of CrI3 and CrCl3 Single Crystals" **MRS ADVANCES** 4, 2169 (2019) DOI: 10.1557/adv.2019.241

(235) A. Li, J.X. Yin, J. Wang, Z. Wu, J. Ma, A.S. Sefat, B.C. Sales, D.G. Mandrus, M.A. McGuire, R. Jin, C. Zhang, P. Dai, B. Lv, C.W. Chu, X. Liang, P.H. Hor, C.S. Ting, S.H. Pan, "Surface terminations and layer-resolved tunneling spectroscopy of the 122 iron pnictide superconductors" Physical Review B 99, 134520 (2019). DOI: 10.1103/PhysRevB.99.134520

(234) P. Vilmercati, Y. Kim, S.-K. Mo, M. McGuire, B. Sales, D. Mandrus, W. Ku, L. Sangaletti, D.J. Singh, N. Mannella "Doping dependence of the magnitude of fluctuating spin moments in the normal state of the pnictide superconductor $Sr(Fe_{1-x}Co_x)_2As_2$ inferred from photoemission spectroscopy" Physical Review B 99, 155132 (2019). DOI: 10.1103/PhysRevB.99.155132

(233) A.F. May, D. Ovchinnikov, Q. Zheng, R. Hermann, S. Calder, B. Huang, Z. Fei, Y. Liu, X. Xu, M.A. McGuire, "Ferromagnetism Near Room Temperature in the Cleavable van der Waals Crystal Fe_5GeTe_2" **ACS NANO** 13, 4436 (2019). DOI: 10.1021/acsnano.8b09660

(232) M.S. Kesler, B. Jensen, L. Zhou, O. Palsyuk, T.H. Kim, M.J. Kramer, I.C. Nlebedim, O. Rios, M.A. McGuire, "Effects of High Magnetic Fields on Phase Transformations in Amorphous $Nd_2Fe_{14}B$" **MAGNETOCHEMISTRY** 5, 16 (2019). DOI:10.3390/magnetochemistry5010016

(231) M.T.K. Kolambage, M.A. McGuire, L.D. Sanjeewa, C.D. McMillen, J.W. Kolis, "Hydrothermal Synthesis of Lanthanide Rhenium Oxides: Structures and Magnetism of $Ln_2Re_2O_7(OH)$ (Ln = Pr, Nd) and $Ln_4Re_2O_{11}$ (*Ln* = Eu, Tb)" **JOURNAL OF SOLID STATE CHEMISTRY** 275, 149 (2019). DOI: 10.1016/j.jssc.2019.03.008

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(229) S.M. Neumayer, E.A. Eliseev, M.A. Susner, A, Tselev, B.J. Rodriguez, J.A. Brehm, S.T. Pantelides, G. Panchapakesan, S. Jesse, S.V. Kalinin, M.A. McGuire, A.N. Morozovska, P. Maksymovych, N. Balke, "Giant negative electrostriction and dielectric tunability in a van derWaals layered ferroelectric" **PHYSICAL REVIEW MATERIALS** 3, 024401 (2019). DOI: 10.1103/PhysRevMaterials.3.024401

(228) T. Song, M.W.-Y. Tu, C. Carnahan, X. Cai, T. Taniguchi, K. Watanabe, M.A. McGuire, D.H. Cobden, D. Xiao, W. Yao, X. Xu "Voltage Control of a van der Waals Spin-Filter Magnetic Tunnel Junction" **NANO LETTERS** 19, 915 (2019). DOI: 10.1021/acs.nanolett.8b04160

(227) V.O. Garlea, L.D. Sanjeewa, M.A. McGuire, C.D. Batista, A.M. Samarakoon, D. Graf, B. Winn, F. Ye, C. Hoffmann, J.W. Kolis "Exotic magnetic field-induced spin-superstructures in a mixed honeycomb triangular lattice system" **PHYSICS REVIEW X** 9, 011038 (2019). DOI: 10.1103/PhysRevX.9.011038

(226) C. Sohn, E. Skoropata, Y. Choi, X. Gao, A. Rastogi, A. Huon, M.A. McGuire, L. Nuckols, Y. Zhang, J.W. Freeland, D. Haskel, H.N. Lee, "Room-Temperature Ferromagnetic Insulating State in Cation-Ordered Double-Perovskite $Sr_2Fe_{1+x}Re_{1-x}O_6$ Films" **ADVANCED MATERIALS**, 1805389 (2018).

(225) Q. Zheng, N.J. Schreiber, H. Zheng, J. Yan, M.A. McGuire, J.F. Mitchell, M. Chi, B.C. Sales, "Real space visualization of competing phases in $La_{0.6}Sr_{2.4}Mn_2O_7$ single crystals" **CHEMISTRY OF MATERIALS** 30, 7962 (2018). DOI: 10.1021/acs.chemmater.8b03589

(224) M.A. McGuire, K.V. Shanavas, M.S. Kesler, D.S. Parker, "Tuning magnetocrystalline anisotropy by cobalt alloying in hexagonal Fe_3Ge" **SCIENTIFIC REPORTS** 8, 14206 (2018). DOI:10.1038/s41598-018-32577-x

(223) V.O. Garlea, M.A. McGuire, L.D. Sanjeewa, D.M. Pajerwoski, F. Ye, J.W. Kolis, "The magnetic order of a manganese vanadate system with two-dimensional striped triangular lattice" **AIP ADVANCES** 8, 101407 (2018). DOI: 10.1063/1.5043124

(222) L. Zhou, T.-H. Kim, B. Jensen, K. Sun, O. Palasyuk, I.C. Nlebedim, M.J. Kramer, M.A. McGuire, O. Rios, B.S. Conner, W.G. Carter, M.S. Kesler, "Microstructural Development in Melt-spun $Nd_2Fe_{14}B$ Under High Magnetic Field Annealing" **MICROSCOPY AND MICROANALYSIS** 24, 958 (2018). DOI: 10.1017/S1431927618005287

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(220) X. Li, W.M. Xu, M.A. McGuire, Y. Cho, M.C. Downer, Y. Wan, X.Y. Li, Z.Y. Li, Q. Cui, J.-G Cheng, J.B. Goodenough, J.-S. Zhou, "Spin freezing into a disordered state in $CaFeTi_2O_6$ synthesized under pressure" **PHYSICAL REVIEW B** 98, 064201 (2018). DOI:10.1103/PhysRevB.98.064201

(219) N. Balke, S.M. Neumayer, J.A. Brehm, M.A. Susner, B.J. Rodriguez, S. Jesse, S.V. Kalinin, S.T. Pantelides, M.A. McGuire, P. Maksymovych, "Locally controlled Cu-ion transport in layered ferroelectric $CuInP_2S_6$" **ACS APPLIED MATERIALS AND INTERFACES** 10, 27188 (2018). DOI: 10.1021/acsami.8b08079

(218) M.A. McGuire, B.C. Sales, "Spin-glass behavior and vacancy order in van der Waals layered β-$MoCl_4$" **PHYSICAL REVIEW MATERIALS** 2, 074007 (2018). DOI: 10.1103/PhysRevMaterials.2.074007

(217) A. A. Aczel, L.M. DeBeer-Schmitt, T.J. Williams, M.A. McGuire, N.J. Ghimire, L. Li, D. Mandrus, "Extended exchange interactions stabilize long-period magnetic structures in $Cr_{1/3}NbS_2$" **APPLIED PHYSICS LETTERS** 113, 032404 (2018). DOI: 10.1063/1.5038021

(216) S. Mukhopadhyay, D.S. Parker, B.C. Sales, A.A. Puretzky, M.A. McGuire, L. Lindsay, "Two-channel model for ultralow thermal conductivity of crystalline Tl_3VSe_4" **SCIENCE** 360, 1455 (2018). DOI: 10.1126/science.aar8072

(215) K.L. Seyler, D. Zhong, B .Huang, X. Linpeng, N.P. Wilson, T. Taniguchi, K. Watanabe, W. Yao, D. Xiao, M.A. McGuire, K.-M.C. Fu, X. Xu, "Valley Manipulation by Optically Tuning the Magnetic Proximity Effect in WSe_2/CrI_3 Heterostructures" **NANO LETTERS** 18, 3823 (2018). DOI: 10.1021/acs.nanolett.8b01105

(214) Y. Choi, P.J. Ryan, M.A. McGuire, B.C. Sales, J.-W. Kim, "Giant magnetostriction effect near onset of spin reorientation in MnBi" **APPLIED PHYSICS LETTERS** 112, 192411 (2018). DOI: 10.1063/1.5026408

(213) T. Song, X. Cai, M.W. Tu, X. Zhang, B. Huang, N.P. Wilson, K.L. Seyler, L. Zhu, T. Taniguchi, K. Watanabe, M.A. McGuire, D.H. Cobden, D. Xiao, W. Yao, X. Xu, "Giant tunneling magnetoresistance in spin-filter van der Waals heterostructures" **SCIENCE**, 360, 1214 (2018). DOI: 10.1126/science.aar4851

(212) B. Huang, G. Clark, D.R. Klein, D. MacNeill, E. Navarro-Moratalla, K.L. Seyler, N. Wilson, M.A. McGuire, D.H. Cobden, D. Xiao, W. Yao, P. Jarillo-Herrero, X. Xu, "Electrical control of 2D magnetism in bilayer CrI_3" **NATURE NANOTECHNOLOGY**, 13, 544 (2018). DOI:10.1038/s41565-018-0121-3

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Patent Applications Pending

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