Contact Information

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Education

Ph. D. 2009 Condensed Matter Physics,
Henry A. Rowland Department of Physics & Astronomy, Johns Hopkins University, Baltimore, MD
M. S. 2002 Condensed Matter Physics, Department of Physics, Nanjing University, Nanjing, China
B. S. 1999 Biophysics, Department of Physics, Nanjing University, Nanjing, China

Professional Experience

2021/04 – now Oak Ridge National Laboratory
STS Instrument Scientist, Second Target Station Project Office
2015/01 – 2021/03 Oak Ridge National Laboratory
Neutron Scattering Scientist, Neutron Sciences Directorate
2009/06 – 2014/11 Argonne National Laboratory
Postdoctoral Appointee/Assistant Physicist (Term), Materials Science Division
2002/08 – 2009/04 Johns Hopkins University
Graduate Teaching/Research Assistant, Henry A. Rowland Department of Physics & Astronomy
1999/09 – 2002/06 Nanjing University
Graduate Teaching/Research Assistant, Department of Physics

Personal Statement

I work at the Second Target Station (STS) Project Office, Oak Ridge National Laboratory. I am currently developing a next-generation single-crystal neutron diffractometer, named PIONEER, for investigating tiny crystals and ultra-thin films that are not feasible at existing instruments. Once built, PIONEER will help researchers speed up novel materials discovery to address national and global challenges. Besides instrumentation, my scientific interests are broadly categorized as quantum materials. The first quantum revolution started nearly a century ago and has brought us modern computers, optical fiber communication, laser, and the global positioning system, all of which are vital to the contemporary civilization. However, our technologies are far from fully harnessing the power of quantum mechanics. We are amidst the second quantum revolution and anticipate it could be as revolutionary as, if not more than, the first one. One central task is manipulating quantum materials to host artificial quantum states by design so that we can engineer the exotic materials properties. Advanced instrumentations are essential to achieve this goal.

Before transferring to STS, I was a neutron scattering scientist at the Spallation Neutron Source (SNS) and worked at the Elastic Diffuse Scattering Spectrometer beamline CORELLI. I have published about 80 peer-reviewed articles; see ORCID (0000-0002-5867-5065) for an up-to-date list. Below are 10 selected publications within last 5 years that highlight my current research:

[2022, diffuse scattering on quantum materials] S. Hameed, D. Pelc, Z. W. Anderson, A. Klein, R. J. Spieker, L. Yue, B. Das, J. Ramberger, M. Lukas, **Y. Liu** et al., "Ferroelectric quantum criticality and enhanced superconductivity in plastically deformed strontium titanate", ***Nature Materials***, **21**, 54.

[2021, neutron diffraction on topological materials] Yaohua Liu, Lin-Lin Wang, Qiang Zheng, Zengle Huang, Xiaoping Wang, Miaofang Chi, Yan Wu, Bryan C. Chakoumakos, Michael A. McGuire, Brian C. Sales, et al., "Site Mixing for Engineering Magnetic Topological Insulators", ***Physical Review X,* 11**, 021033.

[2019, neutron diffraction on magnetic thin films] Jing Zhou, Xiao Wang, **Yaohua Liu**, Jihang Yu, Huixia Fu, Liang Liu, Shaohai Chen, Jinyu Deng, Weinan Lin, Xinyu Shu et al., "Large spin-orbit torque efficiency enhanced by magnetic structure of collinear antiferromagnet IrMn", ***Science Advances 5***, eaau6696.

[2019, complex oxide heterostructures] J Tornos, F Gallego, S Valencia, **YH Liu**, V Rouco, V Lauter, R Abrudan, C Luo, H Ryll, Q Wang et al., "Ferroelectric Control of Interface Spin Filtering in Multiferroic Tunnel Junctions." ***Phys. Rev. Lett.* 122**, 037601.

[2018, diffuse scattering on functional materials] Krogstad, M.J., Gehring, P.M., Rosenkranz, S., Osborn, R., Ye, F., **Liu, Y.**, Ruff, J.P., Chen, W., Wozniak, J.M., Luo, H. et al., "The relation of local order to material properties in relaxor ferroelectrics." ***Nature Mater.* 17**, 718.

[2018, complex oxide heterostructures] Er-Jia Guo, **Yaohua Liu**, Changhee Sohn, Ryan D. Desautels, Andreas Herklotz, Zhaoliang Liao, John Nichols, John W. Freeland, Michael R. Fitzsimmons, and Ho Nyung Lee, "Oxygen Diode Formed in Nickelate Heterostructures by Chemical Potential Mismatch." ***Adv. Mater.* 30**, 1705904.

[2018, neutron diffraction on magnetic thin films] Kishan Sinha, Haohan Wang, Xiao Wang, Liying Zhou, Yuewei Yin, Wenbin Wang, Xuemei Cheng, David J. Keavney, Huibo Cao, **Yaohua Liu** et al., "Tuning the N'eel temperature of hexagonal ferrites by structural distortion." ***Phys. Rev. Lett.* 121**, 237203.

[2018, instrumentation] Feng Ye, **Yaohua Liu**, Ross Whitfield, Ray Osborn, and Stephan Rosenkranz, "Implementation of cross correlation for energy discrimination on the time-of-flight spectrometer CORELLI." ***J. Appl. Crystallogr.* 51**, 315.

[2017, x-ray spectroscopy on magnetic thin films] T. Newhouse-Illige, **Yaohua Liu**, M. Xu, D. Reifsnyder Hickey, A. Kundu, H. Almasi, Chong Bi, X. Wang, J. W. Freeland, D. J. Keavney, et al., "Voltage-controlled interlayer coupling in perpendicularly magnetized magnetic tunnel junctions." ***Nat. Commun.* 8**, 15232.

[2017, quantum spin liquid] Paddison, J.A., Daum, M., Dun, Z., Ehlers, G., **Liu, Y.**, Stone, M.B., Zhou, H. and Mourigal, M., "Continuous excitations of the triangular-lattice quantum spin liquid YbMgGaO4," ***Nat. Phys.* 13**, 117.

Professional Award

[2018] Supplemental Performance Award, Oak Ridge National Laboratory

[2016] Excellence in Research Award, First Place, AIP | APL Materials

[2016] Sentinels of Science Awards, Publons, "Honoring the highest achievers in peer review across the world's journals".

[2009] SPOT Safety Award, Argonne National Laboratory, "For behavior that not only contributes to a better workplace, but keeps us going strong".

Publications (Total ~ 80, total citations > 2700, H-index = 27, Google Scholar)

Peer-Reviewed Journal Articles:

<< 2022 @ ORNL >>

1. S. Hameed, D. Pelc, Z. W. Anderson, A. Klein, R. J. Spieker, L. Yue, B. Das, J. Ramberger, M. Lukas, **Y. Liu**, M. J. Krogstad, R. Osborn, Y. Li, C. Leighton, R. M. Fernandes and M. Greven, "Ferroelectric quantum criticality and enhanced superconductivity in plastically deformed strontium titanate", Nature Materials, **21**, 54 (2022)

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2. **Yaohua Liu**, Lin-Lin Wang, Qiang Zheng, Zengle Huang, Xiaoping Wang, Miaofang Chi, Yan Wu, Bryan C. Chakoumakos, Michael A. McGuire, Brian C. Sales, Weida Wu, and Jiaqiang Yan, "Site Mixing for Engineering Magnetic Topological Insulators", Phys. Rev. X, **11**, 021033 (2021).
3. Chao Liu, **Yaohua Liu**, Bangmin Zhang, Cheng-Jun Sun, Da Lan, Pingfan Chen, Xiaohan Wu, Ping Yang, Xiaojiang Yu, Timothy Charlton, Michael R. Fitzsimmons, Jun Ding, Jingsheng Chen, Gan Moog Chow, "Ferroelectric Self-polarization Controlled Magnetic Stratification and Magnetic Coupling in Ultrathin $La_{0.67}Sr_{0.33}MnO_3$ Films", ACS Applied Materials & Interfaces **13**, 30137 (2021)
4. Michael A. McGuire, Qiang Zhang, Hu Miao, Wei Luo, Mina Yoon, **Yaohua Liu**, Turgut Yilmaz, and Elio Vescovo, "Antiferromagnetic Order and Linear Magnetoresistance in Fe-Substituted Shandite $Co_3In_2S_2$", Chem. Mater. **33**, 9741(2021)
5. Sales, B.C., Meier, W.R., May, A.F., Xing, J., Yan, J.Q., Gao, S., **Liu, Y.H.**, Stone, M.B., Christianson, A.D., Zhang, Q. and McGuire, M.A., "Tuning the flat bands of the kagome metal CoSn with Fe, In, or Ni doping" Phys. Rev. Mater. **5**, 044202 (2021).
6. Gao, Shang, Vilmos Kocsis, Minoru Soda, Feng Ye, Yaohua Liu, Andrew F. May, Yasujiro Taguchi et al. "Suppressed incommensurate order in swedenborgite $Ca_{0.5}Y_{0.5}BaCo_4O_7$." Physical Review B **104**, L140408 (2021)
7. Daichi Ueta, Masahiro Yoshida, Tomohiro Kobuke, Yoichi Ikeda, Akiko Nakao, Taketo Moyoshi, Koji Munakata, **Yaohua Liu**, Takatsugu Masuda, and Hideki Yoshizawa, "Oval-cycloidal Magnetic Structure with Phase-shift in the Non-centrosymmetric Tetragonal Compound CePdSi3", J. Phys. Soc. Jpn. **90**, 114702 (2021)
8. William Steinhardt, P. A. Maksimov, Sachith Dissanayake, Zhenzhong Shi, Nicholas P. Butch, David Graf, Andrey Podlesnyak, **Yaohua Liu**, Yang Zhao, Guangyong Xu, Jeffrey W. Lynn, Casey Marjerrison, A. L. Chernyshev, and Sara Haravifard, "Phase Diagram of YbZnGaO4 in Applied Magnetic Field", npj Quantum Materials **6**, 78 (2021)
9. Zoghlin, Eli, Julian Schmehr, Collin Holgate, Rebecca Dally, **Yaohua Liu**, Geneva Laurita, and Stephen D. Wilson. "Evaluating the Effects of Structural Disorder on the Magnetic Properties of $Nd_2Zr_2O_7$." Phys. Rev. Materials **5**, 084403 (2021)
10. William M. Steinhardt, Zhenzhong Shi, Anjana Samarakoon, Sachith Dissanayake, David Graf, **Yaohua Liu**, Wei Zhu, Casey Marjerrison, Cristian D. Batista, Sara Haravifard "Constraining the parameter space of a quantum spin liquid candidate in applied field with iterative optimization", Phys. Rev. Research, **3** 033050 (2021)
11. Dun, Zhiling, Marcus Daum, Raju Baral, Henry E. Fischer, Huibo Cao, **Yaohua Liu**, Matthew B. Stone et al. "Neutron scattering investigation of proposed Kosterlitz-Thouless transitions in the triangular-lattice Ising antiferromagnet $TmMgGaO_4$." Phys. Rev. B, 1**03**, 064424 (2021).
12. Balz, Christian, Lukas Janssen, Paige Lampen-Kelley, Arnab Banerjee, **Y. H. Liu**, J-Q. Yan, D. G. Mandrus, Matthias Vojta, and Stephen E. Nagler. "Field-induced intermediate ordered phase and anisotropic interlayer interactions in α−$RuCl_3$." Physical Review B **103**, 174417 (2021)
13. Liurukara D Sanjeewa, **Yaohua Liu**, Randy S. Fishman, Mudithangani T. K. Kalambage, Jie Xing, Michael McGuire, Colin D. McMillen, Joseph W. Kolis and Athena S. Sefata, "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 **258**, 2000197 (2021)

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14. **Liu, Yaohua**, Liurukara D. Sanjeewa, V. Ovidiu Garlea, Tiffany M. Smith Pellizzeri, Joseph W. Kolis, and Athena S. Sefat. "Complex magnetic order in the decorated spin-chain system $Rb_2Mn_3(MoO_4)_3(OH)_2$." Phys. Rev. B **101**, 064423 (2020).
15. Zhou, Jing, Xinyu Shu, **Yaohua Liu**, Xiao Wang, Weinan Lin, Shaohai Chen, Liang Liu et al. "Magnetic asymmetry induced anomalous spin-orbit torque in IrMn." Phys. Rev. B **101**, 184403 (2020).
16. Yan, J-Q., **Y. H. Liu**, D. S. Parker, Y. Wu, A. A. Aczel, M. Matsuda, M. A. McGuire, and B. C. Sales. "A-type antiferromagnetic order in $MnBi_4Te_7$ and $MnBi_6Te_{10}$ single crystals." Phys. Rev. Mater. **4**, 054202 (2020).
17. Rai, Binod K., A. D. Christianson, G. Sala, M. B. Stone, **Y. Liu**, and A. F. May. "Magnetism of Nd_2O_3 single crystals near the Néel temperature." Phys. Rev. B **102**, 054434 (2020).
18. Xing, Jie, Erxi Feng, **Yaohua Liu**, Eve Emmanouilidou, Chaowei Hu, Jinyu Liu, David Graf et al. "Néel-type antiferromagnetic order and magnetic field–temperature phase diagram in the spin-1/2 rare-earth honeycomb compound $YbCl_3$." Phys. Rev. B **102**, 014427 (2020).
19. Calder, S., A. V. Haglund, **Y. Liu**, D. M. Pajerowski, H. B. Cao, T. J. Williams, V. O. Garlea, and D. Mandrus. "Magnetic structure and exchange interactions in the layered semiconductor $CrPS_4$." Phys. Rev. Mater. **102**, 024408 (2020).

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20. J Tornos, F Gallego, S Valencia, **YH Liu**, V Rouco, V Lauter, R Abrudan, C Luo, H Ryll, Q Wang, D Hernandez-Martin, G Orfila, M Cabero, F Cuellar, D Arias, FJ Mompean, M Garcia-Hernandez, F Radu, TR Charlton, A Rivera-Calzada, Z Sefrioui, SGE te Velthuis, C Leon, J Santamaria, "Ferroelectric Control of Interface Spin Filtering in Multiferroic Tunnel Junctions." Phys. Rev. Lett. **122**, 037601, (2019).
21. Zhou, Jing, Xiao Wang, **Yaohua Liu**, Jihang Yu, Huixia Fu, Liang Liu, Shaohai Chen et al., "Large spin-orbit torque efficiency enhanced by magnetic structure of collinear antiferromagnet IrMn." Science Advances **5**, eaau6696 (2019).
22. May, Andrew F., Dmitry Ovchinnikov, Qiang Zheng, Raphael Hermann, Stuart Calder, Bevin Huang, Zaiyao Fei, **Yaohua Liu**, Xiaodong Xu, and Michael A. McGuire. "Ferromagnetism Near Room Temperature in the Cleavable van der Waals Crystal Fe_5GeTe_2." ACS Nano **13**, 4436, (2019)
23. Li, Changning, Nicholas Ku, **Yaohua Liu**, Jinbo Pan, Binbo Chai, Feng Hu, Michael Kornecki, Qimin Yan, Raymond Brennan, and Shenqiang Ren. "Magnetically active transition metal cation-substituted alumina." Nanotechnology **31**, 105703 (2019).
24. Sefat, Athena S., Xiaoping P. Wang, **Yaohua Liu**, Qiang Zou, Mimgming Fu, Zheng Gai, Kalaiselvan Ganesan, Yogesh Vohra, Li Li, and David S. Parker. "Lattice disorder effect on magnetic ordering of iron arsenides." Sci. Rep **9**, 1 (2019).
25. Christian Balz, Paula Lampen-Kelley, Arnab Banerjee, Jiaqiang Yan, Zhilun Lu, Xinzhe Hu, Swapnil M. Yadav, Yasu Takano, **Yaohua Liu**, D. Alan Tennant, Mark D. Lumsden, David Mandrus, and Stephen E. Nagler, "Finite field regime for a quantum spin liquid in α−$RuCl_3$." Phys. Rev. B **100**, 060405 (2019).
26. Wang, Haohan, Balamurugan Balasubramanian, Rabindra Pahari, Ralph Skomski, **Yaohua Liu**, Ashfia Huq, D. J. Sellmyer, and Xiaoshan Xu, "Noncollinear spin structure in $Fe_{3+x}Co_{3-x}Ti_2$ (x= 0, 2, 3) from neutron diffraction." Phys. Rev. Mater. **3**, 064403 (2019).

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27. Kishan Sinha, Haohan Wang, Xiao Wang, Liying Zhou, Yuewei Yin, Wenbin Wang, Xuemei Cheng, David J. Keavney, Huibo Cao, **Yaohua Liu**, Xifan Wu, and Xiaoshan Xu, "Tuning the N'eel temperature of hexagonal ferrites by structural distortion." Phys. Rev. Lett. **121**, 237203, (2018).
28. Krogstad, M.J., Gehring, P.M., Rosenkranz, S., Osborn, R., Ye, F., **Liu, Y.**, Ruff, J.P., Chen, W., Wozniak, J.M., Luo, H. and Chmaissem, O., "The relation of local order to material properties in relaxor ferroelectrics." Nature Mater. **17**, 718 (2018).
29. Feng Ye, **Yaohua Liu**, Ross Whitfield, Ray Osborn, and Stephan Rosenkranz, "Implementation of cross correlation for energy discrimination on the time-of-flight spectrometer CORELLI." J. Appl. Crystallogr. **51**, 315 (2018).
30. Er-Jia Guo, **Yaohua Liu**, Changhee Sohn, Ryan D. Desautels, Andreas Herklotz, Zhaoliang Liao, John Nichols, John W. Freeland, Michael R. Fitzsimmons, and Ho Nyung Lee, "Oxygen Diode Formed in Nickelate Heterostructures by Chemical Potential Mismatch." Adv. Mate. **30**, 1705904 (2018).
31. Amanda Huon, Anuradha M. Vibhakar, Alexander J. Grutter, Julie A. Borchers, Steven Disseler, **Yaohua Liu**, Wei Tian, Fabio Orlandi, Pascal Manuel, Dmitry D. Khalyavin, Yogesh Sharma, Andreas Herklotz, Ho Nyung Lee, Michael R. Fitzsimmons, Roger D. Johnson, and Steven J. May, "Helical magnetism in Sr-doped $CaMn_7O_{12}$ films." Phys. Rev. B **98**, 224419, (2018).
32. Ueta, D., M. Yoshida, Y. Ikeda, **Y. Liu**, T. Hong, T. Masuda, and H. Yoshizawa, "Magnetic structure of a non-centrosymmetric CePtSi3." AIP Advances **8**, 115006 (2018).
33. Rebecca L. Dally, Robin Chisnell, Leland Harriger, **Yaohua Liu**, Jeffrey W. Lynn, and Stephen D. Wilson, "Thermal evolution of quasi-one-dimensional spin correlations within the anisotropic triangular lattice of a−$NaMnO_2$." Phys. Rev. B. **98**, 144444 (2018).
34. Coates, L., Cao, H.B., Chakoumakos, B.C., Frontzek, M.D., Hoffmann, C., Kovalevsky, A.Y., **Liu, Y.**, Meilleur, F., Dos Santos, A.M., Myles, D.A.A. and Wang, X.P.,"A suite-level review of the neutron single-crystal diffraction instruments at Oak Ridge National Laboratory." Rev. Sci. Instrum. **89**, 092802 (2018).
35. Arnab Banerjee, Paula Lampen-Kelley, Johannes Knolle, Christian Balz, Adam Anthony Aczel, Barry Winn, **Yaohua Liu**, Daniel Pajerowski, Jiaqiang Yan, Craig A. Bridges, Andrei T. Savici, Bryan C. Chakoumakos, Mark D. Lumsden, David Alan Tennant, Roderich Moessner, David G. Mandrus, and Stephen E. Nagler, "Excitations in the field-induced quantum spin liquid state of a-$RuCl_3$." npj Quantum Materials **3**, 8 (2018).
36. T. Newhouse-Illige, Y. H. Xu, **Y. H. Liu**, S. Huang, H. Kato, C. Bi, M. Xu, B. J. LeRoy, and W. G. Wang, "Temperature dependence of interlayer coupling in perpendicular magnetic tunnel junctions with GdOX barriers." Appl. Phys. Lett. **112**, 072404 (2018).

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37. T. Newhouse-Illige, **Yaohua Liu**, M. Xu, D. Reifsnyder Hickey, A. Kundu, H. Almasi, Chong Bi, X. Wang, J. W. Freeland, D. J. Keavney, C. J. Sun, Y. H. Xu, M. Rosales, X. M. Cheng, Shufeng Zhang, K. A. Mkhoyan, and W. G. Wang, "Voltage-controlled interlayer coupling in perpendicularly magnetized magnetic tunnel junctions." Nat. Commun. **8**, 15232, (2017).
38. Paddison, J.A., Daum, M., Dun, Z., Ehlers, G., **Liu, Y.**, Stone, M.B., Zhou, H. and Mourigal, M., "Continuous excitations of the triangular-lattice quantum spin liquid YbMgGaO4," Nat. Phys. **13**, 117 (2017)

39. Andrew F. May, **Yaohua Liu**, Stuart Calder, David S. Parker, Tribhuwan Pandey, Ercan Cakmak, Huibo Cao, Jiaqiang Yan, and Michael A. McGuire. "Magnetic order and interactions in ferrimagnetic $Mn_3Si_2Te_6$." Phy. Rev. B **95**, 174440 (2017).
40. Xue, X., Zhou, Z., Dong, G., Feng, M., Zhang, Y., Zhao, S., Hu, Z., Ren, W., Ye, Z.G., **Liu, Y.** and Liu, M, "Discovery of enhanced magnetoelectric coupling through electric field control of two-magnon scattering within distorted nanostructures." ACS Nano **11**, 9286 (2017).
41. Patel, Ketan, Victoria Blair, Justin Douglas, Qilin Dai, **Yaohua Liu**, Shenqiang Ren, and Raymond Brennan. "Structural Effects of Lanthanide Dopants on Alumina," Sci. Rep **7**, 39946 (2017).
42. Shi Cao, Kishan Sinha, Xin Zhang, Xiaozhe Zhang, Xiao Wang, Yuewei Yin, Alpha T N'Diaye, Jian Wang, David J Keavney, Tula R Paudel, **Yaohua Liu**, Xuemei Cheng, Evgeny Y Tsymbal, Peter A Dowben, Xiaoshan Xu, "Electronic structure and direct observation of ferrimagnetism in multiferroic hexagonal $YbFeO_3$." Phy. Rev. B, **95**, 224428 (2017).
43. Xiaoshan Xu, Xiaozhe Zhang, Yuewei Yin, Balamurugan Balasubramanian, Bhaskar Das, **Yaohua Liu**, Ashfia Huq, and David J. Sellmyer. "Anti-site mixing and magnetic properties of $Fe_3Co_3Nb_2$ studied via neutron powder diffraction," J. Phys. D: Appl. Phys. **50**, 025002 (2017).
44. Zhao, S., Zhou, Z., Peng, B., Zhu, M., Feng, M., Yang, Q., Yan, Y., Ren, W., Ye, Z.G., **Liu, Y.** and Liu, M., "Quantitative Determination on Ionic-Liquid-Gating Control of Interfacial Magnetism," Adv. Mater. **29**, 1606478 (2017).
45. Zhu, Mingmin, Ziyao Zhou, Bin Peng, Shishun Zhao, Yijun Zhang, Gang Niu, Wei Ren, Zuo-Guang Ye, **Yaohua Liu**, and Ming Liu. "Modulation of Spin Dynamics via Voltage Control of Spin-Lattice Coupling in Multiferroics," Adv. Funct. Mater. **27**, 1605598 (2017).

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46. **Y. Liu,** J. Tornos, S. G. E. te Velthuis, J. W. Freeland, Hua Zhou, P. Steadman, P. Bencok, C. Leon, and J. Santamaria. "Induced Ti magnetization at La0. 7Sr0. 3MnO3 and BaTiO3 interfaces," APL Materials **4**, 046105 (2016).
47. Zhang, W., Sklenar, J., Hsu, B., Jiang, W., Jungfleisch, M.B., Xiao, J., Fradin, F.Y., **Liu, Y.**, Pearson, J.E., Ketterson, J.B. and Yang, Z., "Research Update: Spin transfer torques in permalloy on monolayer MoS2," APL Materials **4**, 032302 (2016).
48. Brian B. Maranville, Brian J. Kirby, Alexander J. Grutter, Paul A. Kienzle, Charles F. Majkrzak, **Yaohua Liu**, and C. L. Dennis. "Measurement and modeling of polarized specular neutron reflectivity in large magnetic fields," J. Appl. Crystallogr. **49**, 1121 (2016).
49. Shen, X., Pennycook, T.J., Hernandez-Martin, D., Pérez, A., Puzyrev, Y.S., **Liu, Y.**, te Velthuis, S.G., Freeland, J.W., Shafer, P., Zhu, C. and Varela, M., 2016. "High On/Off Ratio Memristive Switching of Manganite/Cuprate Bilayer by Interfacial Magnetoelectricity," Adv. Mater. Interfaces **3**, 1600086 (2016).
50. Tian, W., Cao, H., Wang, J., Ye, F., Matsuda, M., Yan, J.Q., **Liu, Y.**, Garlea, V.O., Agrawal, H.K., Chakoumakos, B.C. and Sales, B.C., "Spin-lattice coupling mediated multiferroicity in $(ND_4)_2 FeCl_5 \cdot D_2O$," Phy. Rev. B **94**, .214405 (2016).
51. Balamurugan Balasubramanian , Bhaskar Das , Manh Cuong Nguyen , Xiaoshan Xu , Zhang Jie , Xiaozhe Zhang , **Yaohua Liu** , Ashfia Huq , Shah Valloppilly , Yunlong Jin , Cai-Zhuang Wang , Kai-Ming Ho , David J. Sellmyer, "Structure and Magnetism of New Rare-Earth-Free Intermetallic Compounds: Fe3+xCo3-xTi2 ($0 \leq x \leq 3$)," APL Materials, **4**, 116109 (2016).

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52. **Yaohua Liu**, and Xianglin Ke. "Interfacial magnetism in complex oxide heterostructures probed by neutrons and x-rays," (Invited Review), J. Phys. Condens. Matter **27**, 373003 (2015).
53. Mark Huijben, **Yaohua Liu**, Hans Boschker, Valeria Lauter, Ricardo Egoavil, Jo Verbeeck, Suzanne G. E. te Velthuis, Guus Rijnders, Gertjan Koster, "Enhanced Local Magnetization by Interface Engineering in Perovskite-Type Correlated Oxide Heterostructures," *Adv. Mater. Interfaces* **2**, 1400416 (2015).
54. Lucy, J. M., A. J. Hauser, **Y. Liu**, H. Zhou, Y. Choi, D. Haskel, SGE Te Velthuis, and F. Y. Yang. "Depth-resolved magnetic and structural analysis of relaxing epitaxial Sr_2CrReO_6," *Phy. Rev. B* **91**, 094413 (2015). Wei Zhang, Matthias B. Jungfleisch, Wanjun Jiang, **Yaohua Liu**, John E. Pearson, Suzanne GE te Velthuis, Axel Hoffmann, Frank Freimuth, and Yuriy Mokrousov, "Reduced spin-Hall effects from magnetic proximity," *Phy. Rev. B* **91**, 115316 (2015).
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56. Yuelin Li, Donald A. Walko, Qing'an Li, **Yaohua Liu**, Stephan Rosenkranz, Hong Zheng, and J. F. Mitchell. "Evidence of photo-induced dynamic competition of metallic and insulating phase in a layered manganite," J. Phys. Condens. Matter **27**, 495602 (2015).

<< 2009 -2014 @ Argonne >>

57. Chong Bi, **Yaohua Liu**, T Newhouse-Illige, M Xu, M Rosales, JW Freeland, Oleg Mryasov, Shufeng Zhang, SGE te Velthuis, WG Wang. "Reversible Control of Co Magnetism by Voltage-Induced Oxidation," *Phys. Rev. Lett.* **113**, 267202 (2014).
58. **Yaohua Liu**, J. M. Lucy, A. Glavic, H. Ambaye, V. Lauter, F. Y. Yang, and S. G. E. te Velthuis, "Effects of Strain and Buffer Layer on the Interfacial Magnetization of Sr_2CrReO_6 Films Determined by Polarized Neutron Reflectometry," *Phy. Rev. B* **90**, 104416 (2014).
59. F.A. Cuellar, **Y.H. Liu**, J. Salafranca, N. Nemes, E. Iborra, G. Sanchez-Santolino, M. Varela, M. Garcia Hernandez, J.W. Freeland, M. Zhernenkov, M.R. Fitzsimmons, S. Okamoto, S.J. Pennycook, M. Bibes, A. Barthélémy, S.G.E. te Velthuis, Z. Sefrioui, C. Leon, J. Santamaria, "Reversible electric-field control of magnetization at oxide interfaces," *Nat. Commun.* **5**, 4215 (2014).
60. **Yaohua Liu**, F.A. Cuellar, N.M. Nemes, J. Freeland, Z. Sefrioui, C. Leon, J. Santamaria, S.G.E. te Velthuis, "Emergent Spin Filter at a Ferromagnetic and Insulating Layered Oxide Interface," *Phys. Rev. Lett.* **111**, 247203 (2013).
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Professional Services

- Peer review for scientific journals (~140 times, https://publons.com/author/243558/yaohua-liu):
  - American Physical Society: Phys. Rev. X/Lett./B/Applied/Materials/Research
  - American Chemical Society: ACS Applied Materials and Interfaces
  - AIP Publishing: Appl. Phys. Lett., J. Appl. Phys. and J. Vac. Sci. Technol. B
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  - Royal Society of Chemistry: Phys. Chem. Chem. Phys
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  - Elsevier: Thin solid films, J. Magn. Magn. Mater, J. Adv. Res., Chem. Phys. Lett., Phys. Lett. A
- Proposal Review:
  - National Science Foundation, panelist (2015, 2019, 2020).
  - Argonne LDRD program (2014).
  - Neutron beam time for the NIST Center for Neutron Research (since 2014).
- ORNL internal technical review: 26 times since 2015
- Registered AAAS On-call Scientist
- Workshop Contribution:
  - Introduction to Diffuse Scattering Analysis, Satellite workshop of ACA conference, July 30-31, 2020, Cyber workshop
  - Workshop on Symmetry and Superspace Approach to Modulated Crystal Structure, October 23-24, 2019, Oak Ridge, TN

- First integrated workshop on neutron diffuse scattering from single crystals, June 5-7, 2019, Oak Ridge, TN
- National School on Neutron & X-ray Scattering, 2018 & 2019, Oak Ridge, TN
- US School on Total Scattering Analysis, May 8-12, 2017, Oak Ridge, TN
- Corelli workshop, May 5-7, 2015, Oak Ridge, TN

- Session Chair of Conferences:
  - *Microscopy, Imaging and Characterization II*, Intermag 2018 Conference, April 23-27, 2018, Singapore.
  - *Controlling Magnetism in Oxide Heterostructures II*, APS March Meeting 2018, March 5-9, 2018, Los Angeles, California.
  - *Magnetic Instrumentation and Characterization I*, 62nd Annual Conference on Magnetism and Magnetic Materials, November 6 - 12, 2017, Pittsburgh, Pennsylvania
  - *Magnetic Nanostructures and Thin films,* 2014 American Conference on Neutron Scattering
  - *Scattering and Diffraction,* 2014 APS March Meeting
  - *Complex Oxides: films and heterostructures,* the 58th Annual Conference on Magnetism & Magnetic Materials (2013).