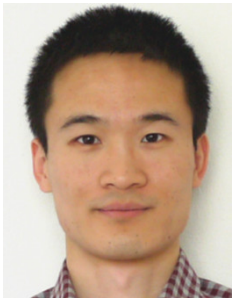

Jianhui Xu

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APPOINTMENTS

First instrument scientist on the polarized neutron diffractometer POLI at FRM-II

- Department: *01. 2022 - Present*
  - Out station at FRM-II, RWTH Aachen Universität
  - Jülich Center for Neutron Science
- Advisor: Prof. Dr. Mirijam Zobel

Instrument scientist on the neutron triple-axis spectrometer MIRA at FRM II *07. 2020 - 12. 2021*

- Department: Heinz Maier-Leibnitz Zentrum, Technische Universität München
- Advisor: Dr. Robert Georgii

Instrument scientist on the neutron triple-axis spectrometer FLEXX in Berlin *03. 2018 - 06. 2020*

- Department: Dynamics and Transport in Quantum Materials, Helmholtz Zentrum Berlin
- Advisor: Priv.-Doz. Dr. Klaus Habicht

Postdoctoral fellow, research in magnetic quantum materials *08. 2017 - 02. 2018*

- Department: Quantum Phenomena in Novel Materials, Helmholtz Zentrum Berlin
- Advisor: Prof. Dr. Bella Lake

EDUCATION

PhD in solid state physics *10. 2013 - 07. 2017*

Helmholtz Zentrum Berlin & Technische Universität Berlin

- Thesis: Magnetic properties of rare earth zirconate pyrochlores (magna cum laude)
- Department: Quantum Phenomena in Novel Materials
- Advisor: Prof. Dr. Bella Lake

Master in condensed matter physics *09. 2010 - 07. 2013*

School of Physics, Peking University

- Thesis: Study on Mn-based intermetallic magnetocaloric materials
- Advisor: Associate Prof. Honglin Du

Bachelor in physics *09. 2006 - 07. 2010*

School of Physical Science and Electronics, Shanxi Datong University

RESEARCH EXPERIENCES & INTERESTS

My research interests are in novel magnetic structure and dynamics in quantum magnets, especially strongly correlated transition-metal and rare-earth compounds, studied using macroscopic measurements and neutron scattering methods.

I am specialized in doing researches using various neutron scattering instruments and responsible for neutron triple-axis spectrometers for more than three years and for polarized neutron diffractometer for nearly two years.

EXPERIMENTAL AND CALCULATION SKILLS

Material synthesis	Arc melting, Solid state reaction, Optic floating zone furnace
Structural analysis	Lab and synchrotron x-ray powder diffraction, X-ray Laue diffraction, Neutron diffraction (powder & single crystal), Neutron diffuse scattering (with polarized & unpolarized neutrons), Rietveld refinement (magnetic & lattice), Magnetic reverse Monte Carlo refinement (short-range correlations)
Lattice and magnetic dynamics	Neutron triple-axis & time-of-flight spectrometers, Muon spin relaxation Measurements under extreme conditions (sub-kelvin temperature, high magnetic field $\sim$ 17T).
Physical property measurement	DC and AC susceptibility, Specific heat (using PPMS and MPMS)
Theory calculation	Mean field, Linear spinwave, Monte Carlo, Molecular dynamics, Crystal field, Machine learning
Instrumentation	Instrument optimisation using McStas
Programming	Python, Matlab, Mathematica (frequently used) C language (basic knowledge)
Languages	Chinese (native proficiency) English (professional working proficiency) German (elementary)

PUBLICATIONS (GOOGLE SCHOLAR PROFILE)

From my own/collaborative work on research and neutron instrumentation

22. **J. Xu**, H. Walker, A. Sakai, P. Gegenwart, and B. Lake, *Quantum disordered state of the octupole-dipole pyrochlore $Sm_2Zr_2O_7$* (in preparation)

21. **J. Xu**, R. Feyerherm, G. Gerrit, M. Russina, B. Lake, *Spin waves and dominate octupolar interactions in $Nd_2Sn_2O_7$* (in preparation)

20. **J. Xu**, V. K. Anand, R. Feyerherm, E. Osmic, S. Chattopadhyay, T. Herrmannsdörfer, C. Ritter, A. Wildes, B. Lake, *Long-range order and re-entrant spin glass in anion disordered $Gd_2Hf_2O_7$* (in preparation)

19. E. Babcock, Z. Salhi, A. Feoktystov, L. J. Bannenberg, S. R. Parnell, D. Alba Venero, V. Hutanu, H. Thoma, **J. Xu**, P. Pistel, J. Damean, A. Ioffe, S. Mattauch, *In-situ ^{3}He neutron spin filters at JCNS, status and updates*, J. Phys.: Conf. Ser. 2481 012009 (2022).

18. A. Samartzis, **J. Xu**, V. K. Anand, A. T. M. N. Islam, J. Ollivier, Y. Su, B. Lake, *Pinch points and half-moons in dipolar-octupolar $Nd_2Hf_2O_7$*, Phys. Rev. B 106, L100401(2022) .

17. **J. Xu**, M. Atterving, M. Skoulatos, A. Ostermann, R. Georgii, T. Keller, and P. Böni, Design of a Neutron Polarizing Bender for a Cold Triple-Axis Spectrometer, Nuc. Inst. Methods A 1031, 166526 (2022).

16. **J. Xu**, Owen Benton, V. K. Anand, A. T. M. N. Islam, T. Guidi, G. Ehlers, and B. Lake, *Order out of Coulomb phase and Higgs transition: frustrated transverse interactions of $Nd_2Zr_2O_7$*, Phys. Rev. Lett. 124, 097203 (2020).

15. **J. Xu**, Owen Benton, V. K. Anand, A. T. M. N. Islam, T. Guidi, G. Ehlers, E. Feng, Y. Su, A. Sakai, P. Gegenwart, and B. Lake, *Anisotropic exchange Hamiltonian, magnetic phase diagram and domain inversion of $Nd_2Zr_2O_7$*, Phys. Rev. B 99, 144420 (2019).

14. V. K. Anand, L. Opherden, **J. Xu**, D. T. Adroja, A. D. Hillier, P. K. Biswas, T. Herrmannsdörfer, M. Uhlarz, J. Hornung, J. Wosnitza, E. Canévet, and B. Lake, *Evidence for a dynamical ground state in the frustrated pyrohafnate $Tb_2Hf_2O_7$*, Phys. Rev. B 97, 094402 (2018).

13. T. Watanabe, S. Kobayashi, Y. Hara, **J. Xu**, B. Lake, J-Q Yan, A. Niazi, D.C. Johnston, *Orbital- and spin-driven lattice instabilities in quasi-one-dimensional CaV_2O_4*, Phys. Rev. B 98, 094427 (2018)

12. **J. Xu**, A. T. M. N. Islam, I. N. Glavatskyy, M. Reehuis, Jens-Uwe Hoffmann, and B. Lake, *Field-induced quantum spin-1/2 chains and disorder in $Nd_2Zr_2O_7$*, Phys. Rev. B 98(R), 060408 (2018).

11. V. K. Anand, A. T. M. N. Islam, A. Samartzis, **J. Xu**, N. Casati, B. Lake, *Optimization of single crystal growth of candidate quantum spin-ice $Pr_2Hf_2O_7$ by optical floating-zone method*, Journal of Crystal Growth 498, 124 (2018).

10. L. Opherden, J. Hornung, T. Herrmannsdörfer, **J. Xu**, A. T. M. N. Islam, B. Lake, and J. Wosnitza, *Evolution of antiferromagnetic domains in the all-in-all-out ordered pyrochlore $Nd_2Zr_2O_7$*, Phys. Rev. B 95, 184418 (2017).

9. V. K. Anand, L. Opherden, **J. Xu**, D. T. Adroja, A. T. M. N. Islam, T. Herrmannsdörfer, J. Hornung, R. Schönemann, M. Uhlarz, H. C. Walker, N. Casati, and B. Lake, *Physical properties of the candidate quantum spin-ice system $Pr_2Hf_2O_7$*, Phys. Rev. B 94, 144415 (2016).

8. **J. Xu**, C. Balz, C. Baines, H. Luetkens, and B. Lake, *Spin dynamics of the ordered dipolar-octupolar pseudospin-1/2 pyrochlore $Nd_2Zr_2O_7$ probed by muon spin relaxation*, Phys. Rev. B 94, 064425 (2016).

7. **J. Xu**, V. K. Anand, A. K. Bera, M. Frontzek, D. L. Abernathy, N. Casati, K. Siemensmeyer, and B. Lake, *Magnetic structure and crystal-field states of the pyrochlore antiferromagnet $Nd_2Zr_2O_7$*, Phys. Rev. B 92, 224430 (2015).

6. V. K. Anand, A. K. Bera, **J. Xu**, T. Herrmannsdörfer, C. Ritter, and B. Lake, *Observation of long-range magnetic ordering in pyrohafnate $Nd_2Hf_2O_7$: A neutron diffraction study*, Phys. Rev. B 92, 184418 (2015).

5. **J. Xu**, W. Yang, Q. Du, Y. Xia, H. Du, J. Yang, C. Wang, J. Han, S. Liu, Y. Zhang and Y. Yang, *Wide temperature span of entropy change in first-order metamagnetic $MnCo_{1-x}Fe_xSi$*, J. Phys. D: Appl. Phys. 47, 065003 (2014).

4. **J. Xu**, X. Liu, Y. Xia, W. Yang, H. Du, J. Yang, Y. Zhang, Y. Yang, *Magnetic properties and magnetocaloric effect of $(Mn_{1-x}Fe_x)_5Sn_3$ ($x = 00.5$) compounds*, J. Appl. Phys. 113, 17A921 (2013).

3. **J. Xu**, Y. Xia, W. Yang, H. Du, J. Yang, C. Wang, J. Han, S. Liu, Y. Yang, *The evolution of the magnetic phases of Sb-doped Mn_5Sn_3 compounds*, J. Appl. Phys., 113, 17E111 (2013).

2. Y. Xia, H. Du, **J. Xu**, Y. Zhang, C. Wang, J. Yang, X. Han, K. Sun, *Crystal structure and magnetic properties of $DyCu_xGa_{2-x}$ ($x = 0-2$) antiferromagnetic compounds*, J. Alloys Compd., 512(1), 212 (2012).

1. Y. Xia, H. Du, **J. Xu**, Y. Zhang, C. Wang, J. Han, S. Liu, Q. Xu, J. Yang, *The magnetic and magnetocaloric properties of $NdFe_{12-x}Mo_x$ compounds*, J. Appl. Phys., 111(7), 07A949 (2012).

Contribution as a local contact for users' neutron experiments

10. X. Wang, F. Zhu, X. Yang, M. Meven, X. Mi, C. Yi, J. Song, T. Müller, W. Schmidt, K. Schmalzl, E. Ressouche, **J. Xu**, M. He, Y. Shi, W. Feng, Y. Mokrousov, S. Blügel, G. Roth, T. Brückel, and Y. Su, *Flat band-engineered spin-density wave in the correlated topological semimetal Mn_3Sn*, arXiv:2306.04312.

9. Y. Qin, Y. Shen, C. Liu, H. Wo, Y. Gao, Y. Feng, X. Zhang, G. Ding, Y. Gu, Q. Wang, S. Shen, H. C. Walker, R. Bewley, **J. Xu**, M. Boehm, P. Steffens, S. Ohira-Kawamura, N. Murai, A. Schneidewind, X. Tong, G. Chen, J. Zhao, *Field-Tuned Quantum Effects in a Triangular-Lattice Ising Magnet*, Science Bulletin 67, 38-44 (2022).

8. H. Trepka, T. Keller, M. Krautloher, **J. Xu**, K. Habicht, M. Böhm, B. Keimer, and M. Hepting, Critical magnetic fluctuations in the layered ruthenates Ca_2RuO_4 and $Ca_3Ru_2O_7$, Phys. Rev. Research 4, 023181 (2022).

7. F. Landolt, Z. Yan, S. Gvasaliya, K. Beauvois, E. Ressouche, **J. Xu**, A. Zheludev, *Phase diagram and spin waves in the frustrated ferro-antiferromagnet $SrZnVO(PO_4)_2$*, Phys. Rev. B 104, 224435 (2021).
6. S. E. Nikitin, A. Podlesnyak, **J. Xu**, D. Voneshen, M. Duc Le, S. L. Bud'ko, P. C. Canfield, D. A. Sokolov, *Magnetic field-induced softening of spin waves and hard-axis order in Kondo-lattice ferromagnet $CeAgSb_2$*, Phys. Rev. B 104, 115169 (2021).
5. F. Zhu, L. Zhang, X. Wang, F. J. d. Santos, J. Song, T. Mueller, K. Schmalzl, W. F. Schmidt, A. Ivanov, J. T. Park, **J. Xu**, J. Ma, S. Lounis, S. Blügel, Y. Mokrousov, Y. Su, T. Brckel, *Topological magnon insulators in two-dimensional van der Waals ferromagnets $CrSiTe_3$ and $CrGeTe_3$: towards intrinsic gap-tunability*, Sci. Adv. 7, eabi7532 (2021).
4. S. E. Nikitin, S. Nishimoto, Y. Fan, J. Wu, L. S. Wu, A. S. Sukhanov, M. Brando, N. S. Pavlovskii, **J. Xu**, L. Vasylechko, R. Yu, A. Podlesnyak, *Multiple fermion scattering in the weakly coupled spin-chain compound $YbAlO_3$*, Nat. Commun. 12, 3599 (2021).
3. P. Y. Portnichenko, A. Akbari, S. E. Nikitin, A. S. Cameron, A. V. Dukhnenko, V. B. Filipov, N. Yu. Shitsevalova, P. Cermak, I. Radelytskyi, A. Schneidewind, J. Ollivier, A. Podlesnyak, Z. Huesges, **J. Xu**, A. Ivanov, Y. Sidis, S. Petit, J.-M. Mignot, P. Thalmeier, D. S. Inosov, *Field-angle resolved magnetic excitations as a probe of hidden-order symmetry in CeB_6*, Phys. Rev. X 10, 021010 (2020).
2. Anup Kumar Bera, Jianda Wu, Wang Yang, Robert Bewley, Martin Boehm, **Jianhui Xu**, Maciej Bartkowiak, Oleksandr Prokhnenko, Bastian Klemke, A. T. M. Nazmul Islam, JosephMathew Law, Zhe Wang and Bella Lake, *Dispersions of Many-Body Bethe Strings*, Nature Physics, 1-6 (2020).
1. V. K. Bhartiya, K. Yu. Povarov, D. Blosser, S. Bettler, Z. Yan, S. Gvasaliya, S. Raymond, E. Ressouche, K. Beauvois, **J. Xu**, F. Yokaichiya, A. Zheludev *Presaturation phase with no dipolar order in a quantum ferro-antiferromagnet*, Phys. Rev. Res., **1**, 033078 (2019).

ATTENDED CONFERENCES AND WORKSHOPS

Conferences (*: invited):

2023	Talk	Joint European Magnetic Symposia 2023, Madrid, Spain.
2022	Poster	Polarized Neutrons for Condensed Matter Investigations 2022, NIST (USA).
2021	Talk*	Neutron optics group meeting at Heinz Maier-Leibnitz Zentrum, Germany.
2021	Poster	Polarized Neutrons for Condensed Matter Investigations 2021, NIST (USA).
2020	Talk	MLZ user Meetings 2020 (online), Garching, Germany.
2019	Talk*	Quantum phenomena group meeting at Heinz Maier-Leibnitz Zentrum, Germany.
2018	Talk	DPG Spring Meetings 2018, Berlin, Germany.
2016	Poster	25^{th} International Conference on Magnetism, Barcelona, Spain.
2015	Talk	Applied Magnetism Center, Peking University, Beijing, China.
2015	Poster	14^{th} International Conference on Quasielastic Neutron Scattering, Potsdam, Germany.
2013	Poster	12^{th} Joint MMM/INTERMAG Conference, Chicago, Illinois, USA.
2012	Talk	12^{th} Panalytical China User Club Meeting, Hangzhou, China.

Workshops:

2023	Talk	LLB-MLZ workshop
2023		FullProf workshop at Heinz Maier-Leibnitz Zentrum
2022		JANA workshop at Heinz Maier-Leibnitz Zentrum
2022		JCNS workshop: High Brilliance Neutron Source, Garching, Germany
2016	Talk	Helmholtz Virtue Institute PhD retreat, Würzburg, Germany.
2015	Talk	Helmholtz Virtue Institute PhD Retreat, Munich, Germany.
2015	Poster	Helmholtz Virtue Institute Workshop, Berlin, Germany.
2014	Poster	Helmholtz Virtue Institute Workshop, Dresden, Germany.
2014	Poster	34^{th} Berlin Neutron School, Berlin, Germany.

AWARDS & OTHER EXPERIENCES

Teaching Experiences

09. 2023	JCNS lab course on polarized neutron scattering (POLI) at MLZ
01. 2023	Polarized neutron diffraction for Master Students at RWTH Aachen University (Prof. M. Zobel)
09. 2012 - 01. 2013	Teaching Assistant for Bachelor students at Peking University
12. 2010 - 01. 2012	Part-time high-school physics teacher at Xueersi Education Group, Beijing

Qualification certificate for teaching in high school in China

Honors and Awards

2012	Chenhuxiong scholarship (first 20%)	School of Physics, Peking University
2008	National scholarship	Shanxi Datong University
2007	Excellent student award	Shanxi Datong University

Paper review

Phys. Rev. Lett. and Phys. Rev. B