CURRICULUM VITAE

Wei Xu (徐伟)

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PROFESSIONAL POSITIONS

2012/07-present Associate researcher, Institute of High Energy Physics, Chinese Academy of Sciences
2010/07- 2012/07 Assistant researcher, Institute of High Energy Physics, Chinese Academy of Sciences
2012/06-2012/08 Visiting Scientist, Brookhaven National Laboratory, US.
2012/08-2012/12 Visiting Scientist**,** Argonne National Laboratory, US.

EDUCATION

2005-2010 Ph.D. Condensed Matter Physics, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing
Advisor: Prof. Ziyu Wu
Thesis Title: "Application of X-ray Absorption Spectroscopy and First Principles on Functional materials"

2008.2-2008.12 Fellowship scholar, Laboratori Nazionali di Frascati, Istituto Nazionale di Fisica Nucleare, Rome
Advisor: Prof. Augusto Marcelli
Project Title: "Conceptual design of an Infrared and X-ray Simultaneous Spectroscopy beamline"

2001-2005 B.S. Materials Physics, Harbin University of Science and Technology, Harbin

RESEARCH INTERESTS

- ✧ Materials sciences, in particular on those with complex atomic, electronic structures
- ✧ X-ray absorption fine-structure spectroscopy, both in experiments and theoretical simulations.
- ✧ X-ray Fluorescence spectroscopy and microscopic mapping
- ✧ Synchrotron optics including crystals and novel mirrors
- ✧ Infrared spectroscopy/microscopy, complex 2d correlation analysis
- ✧ First principles calculations based on density functional theory

MILESTONE PROJECTS

Team leader of the R&D of high energy resolution monochromator at 14 keV, subprojects of the National R&D Projects for High Energy Photon Source in China, **2013-2016**

Principle investigation of "Local structure and transport property relationship of misfit layered $Ca_3Co_4O_9$ based thermoelectric materials", *National Science Foundation of China*, Grant No.11105172, **2012-2014**

Principal participants in the conceptual beamline design of the combinatorial simultaneous X-ray and infrared spectroscopy, with a close collaboration with Dr. Augusto Marcelli **2008-2010**

PUBLICATIONS

Note:* means corresponding author

[1] **W. Xu**, K. Dziedzic-Kocurek, M. Yu, Z. Wu and A. Marcelli, Spectroscopic study and electronic structure of prototypical iron porphyrins and their [small mu]-oxo-dimer derivatives with different functional configurations, RSC Advances, 4, 46399-46406. (2014)

[2] **W. Xu**,* Y. Liu, B.Chen, D. Liu, Y. Lin and A. Marcelli, Nano-inclusions: a novel approach to tune the thermal conductivity of the In_2O_3, *Phys. Chem. Chem. Phys.*, **15**, 17595-17600 (2013)

[3] **W. Xu**, ***** Y. Liu, L. Zhao, P. An, Y. Lin, M. Augusto and Z. Wu, Evidence of an interlayer charge transfer route in $BiCu_{1-x}SeO$, *Journal of Materials Chemistry A*, **1,** 12154-12158 (2013)

[4] **W. Xu**, ***** L.J. Liu, M.Q. Cui, L. Zheng, Y. F. Hu, A. Marcelli and Z. Y. Wu, Electronic structure and hybridization of CaS by means of X-ray absorption spectroscopy at Ca and S *K*-edges, *Journal of Synchrotron Radiation*, 20, 110-115 (2013)

[5] **W. Xu**, ***** X.L. Zhang, Z.Y. Guo, C. Si, Y.D. Zhao, A. Marcelli, D.L. Chen, and Z.Y. Wu, Copper L-edge spectra: multiplet vs. multiple scattering theory, *Journal of Physics: Conference Series*, 430, 012010 (2013)

[6] **W. Xu**, ***** A. Marcelli, L. Liu, C.R. Wang, Z. Y. Wu, Endohedral fullerenes: a concurrent characterization bymeans of synchrotron radiation X-ray and IR spectroscopy, *Journal of Physics: Conference Series*, 430,012069 (2013)

[7] **W. Xu**, A. Marcelli, D. Hampai, L. Malfatti, P. Innocenzi, U. Schade and Z. Wu, New opportunity to investigate physico-chemical phenomena: time-resolved X-ray and IR concurrent analysis, *Rendiconti Lincei*, 22, S59-S79. (2011)

[8] **W. Xu**, Y. Liu, D. Chen, Y.-H. Lin, Z. Wu, Y. Xie, B.-P. Zhang, B. Cheng, C.-W. Nan and Z. Wu, High Temperature Transport Property of Copper site Doped La_2CuO_4, *Journal of the American Ceramic Society*, 94, 1471-1476. (2011)

[9] **W. Xu**, D. Chen, W. Chu, Z. Wu, A. Marcelli, A. Mottana, A. Soldatov and M. F. Brigatti, Quantitative local structure determination in mica crystals: ab initio simulations of polarization XANES at the potassium K-edge, *Journal of Synchrotron Radiation*, 18, 418-426. (2011)

[10] **W. Xu**, A Marcelli, B Joseph, A Iadecola, W S Chu, D Di Gioacchino, A Bianconi, Z. Y. Wu and N. L. Saini, Arsenic K-edge XANES study of REFeAsO oxypnictides, *EPL (Europhysics Letters)*, 90, 57001. (2010)

[11] **W. Xu**, A Marcelli, B Joseph, A Iadecola, W S Chu, D Di Gioacchino, A Bianconi, Z. Y. Wu and N. L. Saini, Local structural disorder in REFeAsO oxypnictides by RE L3 edge XANES, *Journal of Physics: Condensed Matter*, 22, 125701. (2010) (IOP select)

[12] Y. Liu, **W. Xu**, D.B. Liu, M. J. Yu, Y. H. Lin and C. W. Nan, Enhanced thermoelectric properties of Ga-doped In2O3 ceramics via synergetic band gap engineering and phonon suppression, *Phys. Chem. Chem. Phys.*, 2015, DOI: 10.1039/C5CP00739A

[13] S. Butt, **W. Xu**, M. U. Farooq, G. K. Ren, F. Mohmed, Y. Lin and C.-W. Nan, Enhancement of Thermoelectric Performance in Hierarchical Mesoscopic Oxide Composites of $Ca_3Co_4O_9$ and $La_{0.8}Sr_{0.2}CoO_3$, *J. Am. Ceram. Soc.* , (2015) DOI: 10.1111/jace.13459

[14] S. Butt, **W. Xu***, W. Q. He, Q. Tan, G. K. Ren, Y. Lin and C. Nan, Enhancement of thermoelectric performance in Cd-doped Ca3Co4O9 via spin entropy, defect chemistry and phonon scattering, Journal of Materials Chemistry A, 2,19479-19487, (2014)

[15] J. Cheng, **W. Xu**, L. Liu, P. Dong and S. Liu, Heterogeneous Structural Distortions Induced by In-Plane and Out-of-Plane Doping in Iron-Based Superconductors, J Supercond Nov Magn, 1-5. (2014)

[16] M. Huang, **W. Xu**, Y. Shen, Y.-H. Lin, C-W. Nan , X-ray absorption near-edge spectroscopy study on Ge-doped $Li_7La_3Zr_2O_{12}$: enhanced ionic conductivity and defect chemistry, Electrochim. Acta,115, 581-586. (2014)

[17] C. Si, **W. Xu**, H. Wang, J. Zhou, A. Ablat, L. Zhang, J. Cheng, Z. Pan, L. Fan, C. Zou and Z. Wu, Metal-insulator transition in V1-xWxO2: structural and electronic origin, *Physical Chemistry Chemical Physics*, 14, 15021-15028. (2012)

[18] T. Zhao, **W. Xu**, Q. Ye, J. Cheng, H. Zhao, Z. Wu, D. Xia and W. Chu, Local structure of vanadium in doped LiFePO4, *Journal of Synchrotron Radiation*, 17, 584-589. (2010)

[19] Marcelli, **W. Xu**, D. Hampai, L. Malfatti, P. Innocenzi, U. Schade and Z. Wu, Infrared and X-ray simultaneous spectroscopy: a novel conceptual beamline design for time resolved experiments, *Analytical and Bioanalytical Chemistry*, 397, 2095-2108-2108. (2010)

[20] Marcelli, **W. Xu**, L. Liu, C. Wang, W. Chu and Z. Wu, Dynamical behavior in C82 metal endohedral fullerenes: 2D correlation analysis of x-ray and infrared data, *Journal of Nanophotonics*, 3, 031975-031979. (2009)

[21] H. X. Wang, C. H. Zhou, **W. Xu**, Synchrotron radiation based nuclear resonant vibrational spectroscopy: Introduction, WuLi, 43, 579-588. (2014) (In chinese)

[22] H. X. Wang, C. H. Zhou, **W. Xu**, Synchrotron radiation based nuclear resonant vibrational spectroscopy: Applications, WuLi, 43, 640-649. (2014) (In chinese)

[23] W. Jiang, Q. Cai, **W. Xu**, M. Yang, Y. Cai, D. D. Dionysiou and K. E. O'Shea, Cr(VI) Adsorption and Reduction by Humic Acid Coated on Magnetite, Environmental Science & Technology, 48, 8078-8085. (2014)

[24] Y. Liu, J. Lan, **W. Xu**, * Y. Liu, Y. L. Pei, B. Cheng, D. B. Liu, Y. H. Lin and L. D. Zhao, Enhanced thermoelectric performance of a BiCuSeO system via band gap tuning, *Chem. Commun.*, 49, 8075-8077. (2013)

[25] Y-H. Lin, W. Deng, **W. Xu**, Y. Liu, D.L. Chen, X.L. Zhang, and C.W. Nan, Abnormal dielectric behaviors in Mn-doped $CaCu_3Ti_4O_{12}$ ceramics and their response mechanism, Materials Science and Engineering: B 177 (20), 1773 (2012).

[26] Y. Liu, Y.-H. Lin, **W. Xu**, B. Cheng, J. Lan, D. Chen, H. Zhu and C.-W. Nan, High-Temperature Transport Property of In2−xCexO3 ($0 \le x \le 0.10$) Fine Grained Ceramics, *Journal of the American Ceramic Society*, 95, 2568-2572. (2012)

[27] Marcelli, D. Hampai, **W. Xu**, L. Malfatti and P. Innocenzi, Time Resolved IR and X-Ray Simultaneous Spectroscopy: New Opportunities for the Analysis of Fast Chemical-Physical Phenomena in Materials Science, *Acta Physica. Polonica. A*, 115, 489-500. (2009)

[28] N.Poccia, M. Chorro, A. Ricci, **W. Xu**, A. Marcelli, G. Campi and A. Bianconi, Percolative superconductivity in $La_2CuO_{4.06}$ by lattice granularity patterns with μXANES scanning, Appl. Phys. Lett. 104, 221903 (2014)

[29] P. An, C. Hong, J. Zhang, **W. Xu**, and T. Hu, (2014). A facile heating cell for in situ transmittance and fluorescence X-ray absorption spectroscopy investigations. Journal of Synchrotron Radiation, 21, 165-169. (2014)

[30] J. Cheng, P. Dong, W. Chu, **W. Xu**, H. Wen, A. Marcelli and Z. Wu, Strikingly dissimilar effect of Mn and Zn dopants imposed on local structural distortion of $Ba_{0.5}K_{0.5}Fe_2As_2$ superconductor, Journal of Synchrotron Radiation, 20, 455-459. (2013)

[31] J. Cheng, J. Zhou, R. Hu, **W. Xu**, Y. Li, L. Zhang, A. Marcelli, W. Chu, Z.-A. Xu and Z.Y. Wu, Charge redistribution and local lattice structure of (F, Zn)-codoped LaFeAsO superconductor, *New Journal of Physics*, 14, 033005. (2012)

[32] J. Cheng, S. Chu, W. Chu, **W. Xu**, J. Zhou, L. Zhang, H. Zhao, R. Liu, X. Chen, A. Marcelli and Z. Wu, Quantum critical point in SmO1−xFxFeAs and oxygen vacancy induced by high fluorine dopant, *Journal of Synchrotron Radiation*, 18, 723-727. (2011)

[33] A. Ricci, B. Joseph, N. Poccia, **W. Xu**, D. Chen, W. S. Chu, Z. Y. Wu, A. Marcelli, N. L. Saini and A. Bianconi, On the possibility of a new multiband heterostructure at the atomic limit made of alternate CuO2 and FeAs superconducting layers, *Superconductor Science and Technology*, 23, 052003. (2010)

[34] Y. Liu, Y.-H. Lin, J. Lan, **W. Xu**, B.-P. Zhang, C.-W. Nan and H. Zhu, Effect of Transition-Metal Cobalt Doping on the Thermoelectric Performance of In2O3 Ceramics, *Journal of the American Ceramic Society*, 93, 2938-2941. (2010)

[35] N.Poccia, M. Chorro, A. Ricci, **W. Xu**, A. Marcelli, G. Campi and A. Bianconi, Percolative superconductivity in $La_2CuO_{4.06}$ by lattice granularity patterns with μ-XANES scanning, Appl. Phys. Lett. 104, 221903 (2014)

[36] S.-B. Xi, M.-Q. Cui, J.-T. Zhu, D.-L. Yang, **W. Xu**, L.-J. Liu, Z.-Y. Guo, and J. Zhao, An analytical model for the polarization of synchrotron radiation in a soft X-ray region, Chinese Physics C 37 (3), 038002 (2013).

[37] S.-B. Xi, M.-Q. Cui, X.-F. Qin, X.-H. Xu, **W. Xu**, L. Zheng, J. Zhou, L.-J. Liu, D.-L. Yang and Z.-Y. Guo, Origin of Ferromagnetism in $Zn_{1-x}Co_xO$ Thin Films: Evidences Provided by Hard and Soft X-Ray Absorption Spectroscopy, Chinese Physics Letters, 29, 127804 (2012).

[38] Y. Liu, L. Zhao, Y. Liu, J. Lan, **W. Xu**, F. Li, B.-P. Zhang, D. Berardan, N. Dragoe, Y.-H. Lin, C.-W. Nan, J.-F. Li and H. Zhu, Remarkable Enhancement in Thermoelectric Performance of BiCuSeO by Cu deficiencies, *Journal of the American Chemical Society*, 133, 20112–20115. (2011)

[39] Y. Liu, Y.-H. Lin, J. Lan, B.-P. Zhang, **W. Xu**, C.-W. Nan and H. Zhu, Thermoelectric Performance of Zn and Nd Co-doped In2O3 Ceramics, *Journal of Electronic Materials*, 40, 1083-1086. (2011)

[40] G. Cibin, A. Mottana, A. Marcelli, G. Cinque, **W. Xu**, Z. Wu and M. F. Brigatti, The interlayer structure of trioctahedral lithian micas: An AXANES spectroscopy study at the potassium K-edge, *American Mineralogist*, 95, 1084-1094. (2010)

[41] J. Cheng, W. S. Chu, G. Wu, H. F. Zhao, **W. Xu**, J. Zhou, L. J. Zhang, X. H. Chen and Z. Y. Wu, Potassium doping effect on the lattice softening and electronic structure of $Ba_{1-x}K_xFe_2As_2$ probed by X-ray absorption spectroscopy, *Journal of Synchrotron Radiation*, 17, 730-736. (2010)

[42] T. Zhao, W. S. Chu, H. Zhao, X. Liang, **W. Xu**, M. Yu, D. Xia and Z. Wu, XAS study of LiFePO4 synthesized by solid

state reactions and hydrothermal method, Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 619,122-127 (2010).

[43] Marcelli, M. C. Guidi, M. Piccinini, P. Innocenzi, L. Malfatti and **W. Xu**, Synchrotron radiation – a brilliant source for solid-state research in the infrared energy domain, *physica status solidi (c)*, 6, 1999-2007. (2009)

[44] L.-J. Zhang, J.-Q. Wang, J. Li, J. Zhou, W.-P. Cai, J. Cheng, **W. Xu**, G. Yin, X. Wu, Z. Jiang, S. Zhang and Z.-Y. Wu, High-Tc ferromagnetism in a Co-doped ZnO system dominated by the formation of a zinc-blende type Co-rich ZnCoO phase, Chemical Communications, 48, 91-93.(2012).

[45] J. L. Lan, Y. C. Liu, B. Zhan, Y. H. Lin, B. Zhang, X. Yuan, W. Zhang, **W. Xu** and C. W. Nan, Enhanced Thermoelectric Properties of Pb-doped BiCuSeO Ceramics, Advanced materials, 25, 5086-5090 (2013)

[46] Marcelli, P. Innocenzi, L. Malfatti, M.A. Newton, J. V. Rau, E. Ritter, U. Schade and **W. Xu**, IR and X-ray time resolved simultaneous experiments: an opportunity to investigate the dynamics of complex systems and non-equilibrium phenomena using 3rd generation synchrotron radiation sources, *Journal of Synchrotron Radiation*, 19, 892-904. (2012)

[47] X. Jiang, J. Wang, Q. Qin, Y. Dong, W. Sheng, J. Cheng, G. Xu, T. Hu, H. Deng, F. Chen, F. Long, H. Lu, J. Yue, C. Li, Y. Sun, J. Chen, H. Dong, Q. Cai, **W. Xu**, M. Li, G. Chang, H. Zheng, Y. Tao, P. Liu, J. Liu, D. Sun, G. Li, H. Shi and J. Cao, The Chinese High-Energy Photon Source and its R&D Project, Synchrotron Radiation News, 27, 27-31. (2014)

POSTERS

[1] Infrared and X-ray simultaneous spectroscopy: a beamline for time resolved simultaneous analysis of physical-chemical processes
W. Xu, A. Marcelli , D. Hampai , L. Malfatti , P. Innocenzi and Z.Y. Wu
10th International Conference on Synchrotron Radiation Instrumentation, Melbourne, Australia, September 27 – October 2, 2009

[2] A novel beamline of infrared and X-ray simultaneous spectroscopy: opportunities unraveling new sciences
W. Xu , A. Marcelli , D. Hampai , L. Malfatti , P. Innocenzi and Z.Y. Wu
Local distortions and Physics of Functional materials (LPF09), Rome, Italy, July 22-24, 2009

[3] Quantitative local structure determination of mica crystals: ab initio simulations of polarized XANES at the potassium K-edge
W. Xu, D. L. Chen, A. Marcelli, A. Mottana, M.F. Brigatti, W. S. Chu, Z.Y. Wu
21st International conference on x-ray and inner-shell processes, Paris, France, June 22 - 27, 2008

[4] The limits of the muffin-tin approximation for XANES simulations of highly anisotropic systems
W. Xu, D Chen, W Chu, Z Wu,A Soldatov,A Mottana, MF Brigatti, A Marcelli
37th International conference on vacuum ultraviolet and x-ray physics, UBC, Vancouver, Canada July 11-16, 2010

[5] IR and X-ray simultaneous spectroscopy: a novel framework for time resolved simultaneous analysis of physical-chemical processes
A Marcelli, **W. Xu**, P Innocenzi, L Malfatti, D Hampai, U Schade, Z Wu
37th International conference on vacuum ultraviolet and x-ray physics, UBC, Vancouver, Canada July 11-16, 2010

[6] Cr (VI) adsorption and reduction by humic acid coated magnetite: Surface structure.
W.J. Jiang, Q. Cai, **W. Xu**, D. Dionysiou, K.E. O'Shea.
The 245th ACS National Meeting. New Orleans, LA, USA, April 19-23, 2013.

[7] Copper L-edge spectra: multiplet vs. multiple scattering theory
W. Xu, X.L. Zhang, Z.Y. Guo, C. Si, Y.D. Zhao, A. Marcelli, D.L. Chen, and Z.Y. Wu
The 15th International Conference on X-ray Absorption Fine Structure, Beijing, China, July 22-28, 2012

[8] Endohedral fullerenes: a concurrent characterization bymeans of synchrotron radiation X-ray and IR spectroscopy
W. Xu, A. Marcelli, L. Liu, C.R. Wang, Z. Y. Wu,
The 15th International Conference on X-ray Absorption Fine Structure, Beijing, China, July 22-28, 2012

[9] Local configurations and charge transfer mechanisms in heme structures of iron porphyrins
W. Xu, K. Dziedzic-Kocurek, A. Marcelli
38th International conference on Vacuum Ultraviolet and X-ray Physics, Hefei, Anhui Province, China, 12-19 July, 2013

[10] Ray-tracing of nested meV-resolved monochromator: pitfalls and solutions

W. Xu, Y. Cai, A. Marcelli, T.D. Hu and Z.Y Wu

38th International conference on Vacuum Ultraviolet and X-ray Physics, Hefei, Anhui Province, China, 12-19 July, 2013

[11] Can XANES identify silica oligomers structures?

W. Xu, A. Marcelli, G. Cinque, L. Malfatti and P. Innocenzi

38th International conference on Vacuum Ultraviolet and X-ray Physics, Hefei, Anhui Province, China, 12-19 July, 2013

[12] Cr(VI) adsorption and reduction by humic acid coated magnetite

Wenjun Jiang, Quan Cai, **Wei Xu**, Yong Cai, Dionysios D. Dionysiou, Kevin E. O'Shea. San Diego.

The 19th International Conference on Advanced Oxidation Technologies for Treatment of Water, Air and Soil., CA, November 17-21, 2013.

[13]Local structure and dynamics of iron-porphyrin complexes: a theoretical and experimental XAS investigation

K. Dziedzic-Kocurek, **Wei Xu** and A. Marcelli

International Congress on X-Ray Optics and Microanalysis, Hamburg, Germany, September 2-6, 2013

ORAL PRESENTATIONS

High temperature transporting behavior of copper site doped La_2CuO_4

Local distortions and Physics of Functional materials (LPF09) Rome Italy, July 22nd-24th, 2009

New opportunity to investigate physico/chemical phenomena: time resolved X-ray and IR concurrent analysis

1st Bilateral Italian/Chinese Workshop on Synchrotron Radiation Time Resolved Concurrent Experiments: Advantages and Future Applications Shanghai China, November 11th, 2010

Infrared and X-ray Simultaneous Spectroscopy: beamline design and applications

1st National Annual User Meeting of Chinese large scientific infrastructures, Beijing, Aug.25th- 26th, 2011

Summary on Nuclear Resonant Scattering techniques and design of High Energy Resolution Monochromator

Sector 3, Advanced Photon Source, Argonne National Laboratory, Chicago, Dec.7th, 2012

Enhancement of thermoelectric performance of calcium cobaltite by local misfit structures

2ndNational Annual User Meeting of Chinese large scientific infrastructures, Shanghai, Aug. 21st- 22nd, 2013

Introduction to the High Energy Photon Source of China

Seminar talk at Dalian Institute of Chemical Physics, Aug.13-Aug.16, 2014

The era of light: shining the structural and dynamic aspects of energy-related materials

Seminar talk at Guangxi University, Nov.11-Nov.12, 2014

ACADEMIC MEMBERSHIP

International X-ray Absorption Society

SCIENTIFIC ACTIVITIES

Referees for *Surface Review and Letters*; *International Journal of Modern Physics B; X-ray spectrometry; Journal of Physics and Chemistry of Solids, etc.*