

# CURRICULUM VITAE

## **Prof. Xun-Li WANG (王循理)**

*B.S. – Peking University*

*Ph.D. – Iowa State University*



Chair Professor, Department of Physics

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In August 2012, Professor Xun-Li Wang joined City University of Hong Kong as a Chair Professor and Head of the Department of Physics and Materials Science. In July 2017, the department split and Professor Wang assumed the headship of the new Department of Physics starting with 12 faculty members. He oversaw a rapid expansion of the new department, now with a 27+ strong faculty body and growing. In the latest Research Assessment Exercise (RAE2020), commissioned by Hong Kong's University Grants Council, the Department of Physics performed well amongst a very competitive group in Hong Kong. An independent international panel rated 38% of the department's research output as four-star (i.e., "world-leading") and 52% as three-star (i.e., "internationally excellent"). In 2022-2023, he was appointed Executive Director of Hong Kong Institute for Advanced Study (HKIAS). Following the lifting of travel restrictions in Hong Kong, he guided the HKIAS to quickly revitalize its academic program through the appointments of Senior Fellows and Visiting Fellows plus a host of Distinguished Lectures and workshops.

Prior to coming to Hong Kong, he had been working at Oak Ridge National Laboratory in the US, rising through the ranks to Distinguished Staff Member. He was responsible for the design, construction, and commissioning of VULCAN, a powerful engineering diffractometer at the Spallation Neutron Source, Oak Ridge National Laboratory. As a senior scientist in the Neutron Science Directorate, he led innovative research, using neutron scattering as a primary tool, to understand deformation and phase transformation behavior in complex materials.

Since joining City University of Hong Kong, Professor Wang has dedicated his efforts to establishing Hong Kong as an international hub for neutron scattering research. With the support from The Croucher Foundation, he started the biennial Croucher Summer Course on Neutron Scattering. He was also instrumental in launching the Gordon Research Conference series on Neutron Scattering, serving as the inaugural Chair in 2015. In addition, he and Professor Hesheng Chen of the Institute of High Energy Physics, Chinese Academy of Sciences, co-founded a joint laboratory on neutron scattering. The joint laboratory has received financial support from The Croucher Foundation, Hong Kong's Research Grants Council, and the Chinese Academy of Sciences. In 2020, Professor Wang helped establish the Guangdong-Hong Kong-Macau Joint Laboratory on Neutron Scattering, serving as the Executive Director in Hong Kong. In the meanwhile, Professor Wang has maintained an active research portfolio. His current research interests include structure and dynamics in metallic glass, deformation behaviors in high entropy alloys, and magneto-elastic coupling in magnetic shape memory alloys.

Professor Wang received his Ph.D. from Iowa State University and B.S. from Peking University, both in Physics. He is an elected Fellow of the American Physical Society (APS), American Association for the Advancement of Science (AAAS), Neutron Scattering Society of America (NSSA). In 2022, he was elected to the Board of Directors of the American Physical Society.

Research Interests / Areas		
Phase transformation, deformation, magnetism, residual stress determination	Neutron and synchrotron scattering	Metallic glasses, nanostructured materials, magnetic shape memory alloys

## EDUCATION

- 1992 **Ph.D.** in Solid State Physics, **Iowa State University**, USA  
 1985 **B.S.** in Physics, **Peking University**, China

## HONORS AND RECOGNITIONS

- 2024 **Co-Chair**, Gordon Research Conference on Structural Nanomaterials (Les Diablerets, Switzerland, 2024)  
 2024 **Elected to Board of Directors**, American Physical Society  
 2023 **Elected International Councilor**, American Physical Society  
 2023 **Outstanding Research Award** (Natural Science, 2<sup>nd</sup> Class), Ministry of Education of China  
 2021 **Editor**, Acta Materialia and Scripta Materialia  
 2021 **The President's Award**, City University of Hong Kong  
 2021 **Croucher Senior Research Fellowship**, Croucher Foundation  
 2020 **Elected Fellow**, Neutron Scattering Society of America (NSSA)  
 2018 **Lee Hsun Lectureship**, Chinese Academy of Sciences  
 2017 **Elected Fellow**, American Association for the Advancement of Science (AAAS)  
 2015 **Chair** of the inaugural Gordon Research Conference on Neutron Scattering, Hong Kong  
 2010 **Elected Fellow**, American Physical Society (APS)  
 2009 **Chang Jiang Chair Professorship** (长江讲座教授), Chinese Ministry of Education  
 2006 **Outstanding Oversea Young Scientist Award** (国家自然科学基金B类项目), National Natural Science Foundation of China  
 2003 **Significant Event Award**, Oak Ridge National Laboratory, USA  
 1999 **A. F. Davis Silver Medal**, American Welding Society  
 1998 **Significant Event Award**, Oak Ridge National Laboratory, USA  
 1985 **CUSPEA** (China-U.S. Physics Examination and Application) **Scholar**, Chinese Ministry of Education

## EMPLOYMENT HISTORY

### City University of Hong Kong, Hong Kong (2012 – present)

- Since 2017 **Chair Professor**, Department of Physics  
 2022-2023 **Executive Director**, Hong Kong Institute for Advanced Study  
 2017-2023 **Chair Professor and Founding Head**, Department of Physics  
 2012-2017 **Chair Professor and Head**, Department of Physics & Materials Science

### Oak Ridge National Laboratory, USA (1992 – 2012)

- 2009-2012 **Distinguished Research Staff**  
 2006-2011 **Group Leader**, Powder Diffraction Group, Neutron Scattering Science Division

- 2004-2006 **Senior Research Staff and Team Leader**, Experimental Facilities Division, Spallation Neutron Source Project  
1999-2003 **Instrument Scientist**, Spallation Neutron Source Project  
1994-1999 **Research Staff Member**, Metals and Ceramics Division  
1992-1994 **Postdoctoral Fellow**, Metals and Ceramics Division

## PROFESSIONAL APPOINTMENTS

- Since 2024 **Member of the Board of Directors**, American Physical Society  
Since 2023 **Elected International Councilor**, American Physical Society  
Since 2021 **Editor, Acta Materialia and Scripta Materialia**  
2019-2023 **President**, Physical Society of Hong Kong

## VISITING APPOINTMENTS

- 2024 **Visiting Professor**, Peking University  
2015-2018 **Guest Professor**, Institute of High Energy Physics, Chinese Academy of Sciences  
2011 **Guest Scientist**, National Institute for Materials Science (NIMS), Japan

## SELECTED PUBLICATIONS (~ 280 in total)

To view the full list of publications, please click [HERE](#).

- [1] G L. Cai, Y. Li, Y. Fu, H. Yang, L. Mei, Z. Nie, T. Li, H. Liu, Y. Ke, **X.-L. Wang**, J.-L. Bredas, M. C. Tang, X. K. Chen, X. W. Zhan, and X. H. Lu, "Deuteration-enhanced neutron contrasts to probe amorphous domain sizes in organic photovoltaic bulk heterojunction films," *Nature Communications* 15, 2784 (2024).
- [2] Y. M. Ma, M. Naeem, L. Zhu, H. Y. He, X. Sun, Z. Yang, F. He, S. Harjo, T. Kawasaki, **X.-L. Wang**, "[Microscopic insights of the extraordinary work-hardening due to phase transformation](#)," *Acta Materialia*, 119822 (2024)
- [3] X. Xia, T.K. Lau, X. Guo, Y. Li, M. Qin, K. Liu, Z. Chen, X. Zhan, Y. Xiao, P.F. Chan, H. Liu, L. Xu, G. Cai, N. Li, H. Zhu, G. Li, Y. Zhu, T. Zhu, X. Zhan, **X.-L. Wang**, X. Lu, "Uncovering the out-of-plane nanomorphology of organic photovoltaic bulk heterojunction by GTSAXS", *Nature Communications*, 12, 1, 1-10 (2021).
- [4] S. Lan, L. Zhu, Z. D. Wu, L.n Gu, Q. H. Zhang, H. H. Kong , J. Z. Liu, R. Y. Song, S. N. Liu, G. Sha, Y. G. Wang, Q. Liu, W. Liu, P. Y. Wang, C. T. Liu, Y. Ren, and **X.-L. Wang**, "A medium-range structure motif linking amorphous and crystalline states," *Nature Materials* (2021).
- [5] H.Y. He, M. Naeem, F. Zhang, Y.L. Zhao, S. Harjo, T. Kawasaki, B. Wang, X.L. Wu, S. Lan, Z.D. Wu, W. Yin, Y. Wu, Z.P. Lu, J.J. Kai, C.T. Liu, **X.-L. Wang**, "Stacking Fault Driven Phase Transformation in CrCoNi Medium Entropy Alloy", *Nano Letters*, 21, 3, 1419–1426 (2021).
- [6] X. Y. Li, H. P. Zhang, S. Lan, D. L. Abernathy, T. Otomo, F. W. Wang, Y. Ren, M. Z. Li, and **X.-L. Wang**, "Observation of High-Frequency Transverse Phonons in Metallic Glasses", *Physical Review Letters*, 124, 225902 (2020).
- [7] M. Naeem, H. Y. He, F. Zhang, H. L. Huang, S. Harjo, T. Kawasaki, B. Wang, S. Lan, Z. D. Wu, F. Wang, Y. Wu, Z. P. Lu, Z. W. Zhang, C. T. Liu, and **X.-L. Wang\***, "Cooperative deformation in high-entropy alloys at ultralow temperatures," *Science Advances*, 6, eaax4002 (2020).
- [8] X. Y. Li, P.-F. Liu, E. Y. Zhao, Z. G. Zhang, T. Guidi, M. Le, M. Avdeev, K. Ikeda, T. Otomo, M. Kofu, K. Nakajima, J. Chen, L. H. He, Y. Ren, **X.-L. Wang**, B. T. Wang, Z. F. Ren, H. Z. Zhao, and

- F. W. Wang, "Ultralow Thermal Conductivity from Transverse Acoustic Phonon Suppression in Distorted Crystalline  $\alpha$ -MgAgSb," *Nature Communications*, 11, 1-9 (2020).
- [9] C. C. Yuan, F. Yang, X. K. Xi, C. L. Shi, D. Holland-Moritz, M. Z. Li, F. Hu, B. L. Shen, **X.-L. Wang**, A. Meyer, and W. H. Wang, "Impact of hybridization on metallic-glass formation and design," *Materials Today*, 32, 26-34 (2020).
- [10] S. Lan, C. Y. Guo, W. Z. Zhou, Y. Ren, J. Almer, C. Q. Pei, H. Hahn, C. T. Liu, T. Feng\*, **X.-L. Wang\***, and H. Gleiter, "Engineering medium-range order and polyamorphism in a nanostructured amorphous alloy," *Communication Physics*, 2, 1-9 (2019)
- [11] Y. Zhao, X. Tong, X. H. Wei, S. S. Xu, S. Lan, **X.-L. Wang**, and Z. W. Zhang "Effects of microstructure on crack resistance and low-temperature toughness of ultra-low carbon high strength steel," *International Journal of Plasticity*, **116**, 203-215 (2019)
- [12] S. Lan, Y. Ren, X. Y. Wei, B. Wang, E. P. Gilbert, T. Shibayama, S. Watanabe, M. Ohnuma, and **X.-L. Wang\***, "Hidden Amorphous Phase and Reentrant Supercooled Liquid in Pd-Ni-P Metallic Glasses," *Nature Communications* **8**, 14679 (2017); doi:10.1038/ncomms14679  
(This work solved a 40-year old scientific mystery. The story was covered widely in news media in English, Japanese, and Chinese.  
Examples, <https://www.rdmag.com/news/2017/03/atomic-re-packaging-behind-metallic-glass-mystery>;  
<https://phys.org/news/2017-03-insights-superior-metallic-alloys.html>  
<http://www.nsf.gov.cn/publish/portal0/tab448/info68359.htm>  
Also featured in Nature Communications collection series, Metallurgy)
- [13] H. S. Chen, and **X.-L. Wang\***, "China's first pulsed neutron source," *Nature Materials*, **15**, 689 – 691 (2016); doi:10.1038/nmat4655.
- [14] A. Pramanick, M. R. V. Jørgensen, S. O. Diallo, A. D. Christianson, J. A. Fernandez-Baca, C. Hoffmann, X. Wang, S. Lan, and **X.-L. Wang**, "Nanoscale Atomic Displacements Ordering for Enhanced Piezoelectric Properties in Lead-free ABO<sub>3</sub> Ferroelectrics," *Advanced Materials.*, **27**, 4330-4335 (2015) (**front cover**). doi:10.1002/adma.201501274
- [15] A. Pramanick, **X.-L. Wang\***, A. D. Stoica, C. Yu, Y. Ren, S. Tang, and Z. Gai, "Kinetics of magnetoelastic twin boundary motion in ferromagnetic shape memory alloys," *Physical Review Letters*, **112**, 217205 (2014). DOI: <http://dx.doi.org/10.1103/PhysRevLett.112.217205>
- [16] S. Cheng, S. Y. Lee, C. Lei, L. Li, J. Almer, **X.-L. Wang**, Y. M. Wang, T. Ungar, P. K. Liaw, "Uncommon Deformation Mechanisms during Fatigue-Crack Propagation in Nanocrystalline Alloys," *Physical Review Letters*, **110**, 135501 (2013). DOI: 10.1103/PhysRevLett.110.135501
- [17] Y. Wu, D. Q. Zhou, W. L. Song, H. Wang, Z.Y. Zhang, D. Ma, **X. L. Wang**, and Z. P. Lu, "Ductilizing Bulk Metallic Glass Composite by Tailoring Stacking Fault Energy," *Physical Review Letters*, **109**, 245506 (2012). DOI: 10.1103/PhysRevLett.109.245506
- [18] D. Ma, A. D. Stoica, **X.-L. Wang\***, Z. P. Lu, B. Clausen, D. W. Brown, "Moduli inheritance and the weakest link in metallic glasses," *Physical Review Letters*, **108**, 085501 (2012) (**covered by News and Views, Nature Materials**, 11, 275–276 (2012))
- [19] **X.-L. Wang**, K. An, L. Cai, Z. Feng, S. E. Nagler, C. Daniels, K. J. Rhodes, D. L. Wood, III., A. D. Stoica, H. D. Skorpenske, C. Liang, W. Zhang, Y. Kim, Y. Qi, and S. J. Harris, "Visualizing the chemistry and structure dynamics in Li-ion batteries by in-situ neutron diffraction," *Scientific Report*, **2**, 747; DOI:10.1038/srep00747 (2012).
- [20] I. Robertson, C. Schuh, J. Vetro, N. Browning, D. Field, D. Juul-Jensen, M. Miller, I. Baker, D. Dunand, R. Dunin-Borkowski, B. Kabius, T. Kelly, S. Lorano-Perez, A. Misra, G. Rohrer, T. Rollett, M. Taheri, G. Thomson, M. Uchic, **X.-L. Wang**, G. Was, "Towards an integrated materials characterization toolbox," a viewpoint paper in *Journal of Materials Research*, **26**, 1341-1383 (2011)
- [21] Z. W. Zhang, C. T. Liu, **X.-L. Wang**, K. C. Littrell, M. K. Miller, K. An, and B. A. Chin, "From embryos to precipitates: a study of nucleation and growth in a multicomponent ferritic steel," *Physical Review B*, **84**, 174114 (2011)

- [22] S. Cheng, Y. Zhao, Y. Wang, Y. Li, **X.-L. Wang**, P. K. Liaw, and E. J. Lavernia, "Structure modulation in nanocrystalline NiFe driven by cyclic deformation," *Physical Review Letters*, **104**, 255501 (2010)
- [23] S. Cheng, Y. Zhao, Q. Wei, **X.-L. Wang**, Y. Ren, P. K. Liaw, H. Choo, and E. J. Lavernia, "Substantial Deformation of Nanocrystalline NiFe Alloy under Dynamic Loading," *Advanced Materials*, **21**, 5001–5004 (2009)
- [24] S. Cheng, A.D. Stoica, **X.-L. Wang\***, Y. Ren, J. Almer, J.A. Horton, C.T. Liu, B. Clausen, D.W. Brown, P.K. Liaw, and L. Zuo, "Deformation cross-over: from nano to meso scales," *Physical Review Letters*, **103**, 035502 (2009)  
(selected for inclusion in August 3 issue of Virtual Journal of Nanoscale Science & Technology)
- [25] D. Ma, A. D. Stoica, and **X.-L. Wang\***, "Power-law scaling and fractal nature of the medium range order in metallic glasses," *Nature Materials*, **8**, 30-34 (2009)
- [26] L. Yang, M. K. Miller, **X.-L. Wang\***, C. T. Liu, A. D. Stoica, D. Ma, J. Almer, and D. Shi, "Nano-scale solute partitioning in devitrified bulk metallic glass," *Advanced Materials*, **21**, 305-308 (2009)  
(featured on the cover).
- [27] C. T. Liu, C. L. Fu, M. F. Chrisholm, and J. R. Thompson, Krcmar, and **X.-L. Wang**, "Magnetism and solid solution effects in NiAl (40%Al) alloys," *Progress in Materials Science*, **52**, 352-370, 2007.
- [28] **X.-L. Wang**, "Application of neutron diffraction to engineering problems," review article in *JOM*, March, 53-58, 2006.
- [29] **X.-L. Wang\***, T. M. Holden, G. Q. Rennich, A. D. Stoica, P. K. Liaw, H. Choo, and C. R. Hubbard, "VULCAN – The Engineering Diffractometer at the SNS," *Physica B*, **385-386**, 673-675 (2006).
- [30] **X.-L. Wang\***, J. Almer, Y. D. Wang, J. K. Zhao, C. T. Liu, A. D. Stoica, D R. Haeffner, and W. H. Wang, "In-situ Synchrotron Study of Phase Transformation Behaviors in Bulk Metallic Glass Using Simultaneous X-ray Diffraction and Small Angle Scattering," *Physical Review Letters*, **91**, 265501 (2003).
- [31] Y.D. Wang, H. Tian, A. D. Stoica, **X.-L. Wang\***, P. K. Liaw, and J.W. Richardson, "Development of Large Grain-Orientation-Dependent Residual Stresses in a Cyclically-Deformed Alloy," *Nature Materials*, **2**, 103-106 (2003).  
(covered by Materials Today, [http://www.materialstoday.com/pdfs\\_6\\_3/research.pdf](http://www.materialstoday.com/pdfs_6_3/research.pdf))
- [32] W.-T. Lee and **X.-L. Wang**, "IDEAS, a General-purpose Computer Program for Simulation of Neutron Scattering Instruments," *Neutron News*, **13** (No. 4), 30-34 (2002).
- [33] **X.-L. Wang**, "Conceptual Design of the SNS Engineering Diffractometer", SNS Report No. IS-1.1.8.2-6035-RE-A-00 (2000)
- [34] Z. Wang, **X.-L. Wang**, J. A. Fernandez-Baca, D. C. Johnston, and D. Vaknin, "Antiferromagnetic Ordering and Paramagnetic Behavior of Ferromagnetic Clusters in BaCuO<sub>2+x</sub>," *Science*, **264**, 402-404 (1994)
- [35] L. L. Miller, **X. L. Wang**, S. X. Wang, C. Stassis, D. C. Johnston, J. Faber Jr., and C.-K. Loong, "Synthesis, Structure and Properties of Sr<sub>2</sub>CuO<sub>2</sub>Cl<sub>2</sub>," *Physical Review B*, **41**, 1921 (1990).

## SELECTED INVITED TALKS (~150 in total)

1. Colloquia Speaker, Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard University, "Low-Temperature Deformation in High-Entropy Alloys," October 20, 2023
2. Distinguished Colloquium, School of Physics, Peking University, "Structure and Dynamics of Metallic Glass - Atomistic Insights from Scattering Experiments," October 14, 2023  
(Special colloquium celebrating the 110th Anniversary of Physics at Peking University)
3. Plenary Speaker, The 18th International Conference on Liquid and Amorphous Metals, Hiroshima, Japan, September 4-9 (2022)
4. Plenary Speaker, The 10th International Conference on Mechanical Stress Evaluation by Neutron and Synchrotron Radiation (MECA-SENS), Prague, Czech Republic, 2021
5. Plenary Speaker, 2019 Asia Oceana Conference on Neutron Scattering, Kenting, Taiwan, 2019

6. The President's Lecture Series: Excellence in Academia, City University of Hong Kong, 2019
7. Lee Hsun Lecture, Institute of Metal Research, Chinese Academy of Sciences, 2018
8. Gordon Research Conference on Neutron Scattering, Hong Kong, 2017
9. International Conference on Neutron Scattering, Daejeon, Korea, 2017
10. Armourers & Brasiers' Cambridge Forum, University of Cambridge, UK, 2017
11. Seminar at Department of Physics, University of California, San Diego, USA, 2017
12. Material Research Society Fall Meeting, Boston, USA, 2016
13. Material Research Society Fall Meeting, Boston, USA, 2015
14. Keynote at the 3rd Neutron Scattering User Meeting in China, Peking University, China, 2015
15. Gordon Research Conference on Structural Nanomaterials, Hong Kong, 2014
16. Seminar at Department of Chemistry, University of Sydney, Australia, 2014
17. Plenary Lecture, The 16th Hong Kong Physical Society Annual Meeting, Hong Kong, 2013
18. Seminar at School of Physics, Peking University, China, 2013
19. Knowledge Innovation Forum, Institute of High Energy Physics, Chinese Academy of Sciences, China, 2013
20. Colloquium at Department of Physics, Fudan University, China, 2013
21. Materials Research Society Fall Meeting, Boston, USA, 2012
22. Seminar at Department of Nuclear Engineering, MIT, USA, 2012
23. Seminar at School of Engineering and Applied Sciences, Harvard University, USA, 2012
24. The ISIS Facilities, Rutherford Appleton Laboratory, UK, 2011
25. The 43rd Erice Crystallographic Course, entitled "The Power of Powder Diffraction", Erice, Sicily, Italy, 2011
26. HANARO 15th Anniversary Celebration Symposium 2010, Daejeon, Korea, 2010
27. Colloquium at Department of Physics, University of North Carolina at Chapel Hill, 2010
28. Institute of Metal Research, Tohoku University, Japan, 2009
29. US DOE-BES workshop "Characterizing Materials Damage in Four Dimensions," 2009
30. The International Conference on Neutron Scattering, Knoxville, USA, 2009
31. The 137th Lecture of Zhong Guan Chun Forum (中关村论坛), Institute of Physics, Chinese Academy of Science, China, 2008
32. US DOE/BES Mechanical Behavior Contractors Meeting, San Antonio, USA (by invitation only), 2006
33. Winter Neutron School, Los Alamos National Laboratory, USA, 2005
34. Institute Laue-Langevin, France, 1997
35. Materials Department, University of California at Santa Barbara, Santa Barbara, California, 1996
36. May 1995, GE Aircraft Engines, Cincinnati, Ohio, 1995