



AHMAD S. MASADEH

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Education :

2004–2008: **Ph.D.** in Experimental Condensed Matter Phys., MichiganState Univ., MI, USA

2002–2004 **M.S.** in Physics, Michigan State Univ., East Lansing MI, USA

1994–1998 **B.S.** in Physics, Yarmouk University, Irbid, Jordan.

Teaching Experience:

2022- now: Full Professor, Dept. of Phys. The University of Jordan, Amman, Jordan

2013- 2022: Associate Professor, Dept. of Phys. The University of Jordan, Amman, Jordan.

2008- 2013: Assistance Professor, Dept. of Phys. The University of Jordan, Amman, Jordan.

2002–2003: Teaching Assistant, Dept. of Phys., Western Michigan State University, MI

2001–2002: Teaching Assistant, Dept. of Phys., Western Michigan University, Kalamazoo, MI-

1998–2000: Teaching Assistant, Dept. of Phys., Yarmouk University, Irbid, Jordan

Research Experience:

Sept.15- May16: Visiting Research Associate, Dept. of Applied Physics and Applied Math, Columbia University, NY and Argonne National Laboratory Chicago.

June –Sep.09: Visiting Research Associate, Dept of Phys, NJIT, Newark, NJ.

May.03-July08: Research Assistant, Dept. of Physics, Michigan State University, MI

Research fields:

[1] Investigation of atomic **arrangements** in **nanstructured materials** (such nanoparticles) using the atomic pair distribution function (PDF) technique.

[2] Studying the atomic structure of pharmaceutical materials at different atomic length scales using the pair distribution function methods.

[3] Characterization of the local atomic distortions in crystalline materials at different length using three dimensions direct real space probe, the pair distribution function (PDF) technique.

Skills and Experience:

1. Experience in analyzing total scattering data, using local structure PDF methods, resulting in quantitative structural information at different atomic length scales.

2. Experience in conducting x-ray powder diffraction experiment using synchrotron or in-house X-ray machine.

3. Experience in conducting total scattering experiment using synchrotron or in-house X-ray machine.

4. Experience in atomic structure analysis (Rietveld).

5. Experience in wide angle x-ray (SAX) scattering.

6. Very familiar with Linux, Matlab, SPEC and LATEX.

Professional Experience:

2020 – present : Chair of Physics Department at the University of Jordan.

2014 – 2015: Chair of Physics Department at the University of Jordan.

2014: Lecturer in the 12th international school and workshop of crystallography: synchrotron radiation in nanomaterials research, El-Gouna, Egypt, 2014.

2012-2015: Member of the interim user's executive committee of SESAME synchrotron.

2008: PDF-Workshop speaker, 4th American Conference on Neutron Scattering, Santa Fe, NM, hosted by the Lujan Neutron Scattering Center at Los Alamos National.

2005: Lecturer of PDF structural studies-Workshop, MSU, East Lansing, MI

2005: Workshop Co-organizer, "PDF structural studies-Workshop", MSU, East Lansing, MI

2005-2006: NIRT (Nanoscale Interdisciplinary Research Team) seminar organizer, MSU, East Lansing, MI.

Honors/Awards:

2014: invited speaker, 12th international school and workshop of crystallography: synchrotron radiation in nanomaterials research, El-Gouna, Egypt, 2014.

2008: Neutron Scattering Society of America travel award, Santa Fe, NM, USA.

2007: Selected Participant of Advanced Workshop on Nanomaterials, The Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, ITALY

2004: Selected Participant of National School on Neutron and X-ray Scattering, Argonne National Laboratory, Chicago, USA.

2004: Student Award, "Center for Fundamental Materials Research CFMR symposium", *East Lansing, MI.*

1998: Award for outstanding academic performance, Yarmouk University, Irbid, Jordan.

Grants:

[1] Principal Investigator (PI) and co-PI on over 10 experiment proposals resulted in over 30 days of the beam-time granted in a peer-review process under highly competitive conditions in national laboratories (APS at Argonne National Laboratory and NSLS at Brookhaven National Laboratory).

[2] **2012- 2015** Research grant from The University of Jordan, 2012. (6100.0 JD)

Title: "Investigation of local atomic structure distortions in complex structured materials using synchrotron X-Ray atomic Pair Distribution Function (PDF) technique."

Presentations:

[1] Talks

2016 Annual APS March Meeting, Abstracts 2016, F23. 006

2014: The International Year of Crystallography 2014 (IYCr2014): Quantitative structure determination of Nanostructured materials using PDF analysis.

2013: Annual APS March Meeting, Baltimore, Investigation of the experimental effects on the quality of the rapid acquisition pair distribution function (RA-PDF) data

2012: 8th Workshop of the Jordanian National Committees for SESAME. Quantitative size-dependent structure and strain determination of CdSe nanoparticles using PDF analysis

2011: Annual APS March Meeting, Dallas, Structure investigation of ultra-small CdSe nanoparticles using the atomic PDF

2011: SESAME-LinkSCEEM HPC Summer School, Material Structure Using PDF analysis.

2010: Invited talk, New York, Brookhaven National Lab., Quantitative structure determination of complex-structured materials using PDF analysis

2010: Annual APS March Meeting, Portland, Low Temperature Local Structure of Multiferroic of ReMn_2O_5

2009: Annual APS March Meeting, Pittsburgh, Local Structure Investigation of ReMn_2O_5

2006: NIRT Net-Meeting Seminar, East Lansing, MI, Accurate structure and size determination of CdSe nanoparticles using PDF analysis

2006: Annual APS March Meeting, Baltimore, Atomic PDF study of size and structure of CdSe nanoparticles

[2] Presented Posters

2012: Quantitative structure determination of complex-structured materials using PDF analysis. 10th SESAME users' meeting.

2008: Nanostructured of Advanced Materials, Amman, Jordan, Quantitative size-dependent structure and strain determination of CdSe nanoparticles using atomic pair distribution function analysis,

2008: The fourth American Conference on Neutron Scattering, Santa Fe, NM, hosted by the LNS Scattering Center at Los Alamos National, The nanostructure problem.

2007: The Advanced Workshop on Nanomaterials at ICTP, Trieste, ITALY, Accurate Structure and size determination of CdSe nanoparticles using PDF analysis.

2006: The 5th International Conference on Synchrotron Radiation in Materials Science (SRMS5), Chicago, Accurate structure and size determination of CdSe nanoparticles using PDF analysis.

2004: Center of Fundamental Materials Research (CFMR) Annual Symposium, E. Lansing, Probing the accuracy of the rapid acquisition pair distribution function (RA-PDF) Technique using data from simple elements.

Publications :

20- Ahmad S. Masadeh, Gassem M. Alzoubi, Moneeb T. M. Shatnawi, Osama Abu-Haija, Ziad Abu Waar, Yang Ren. Toward an understanding of the anisotropy in hcp zinc metal: total scattering structural study using synchrotron-based, temperature-dependent, X-ray pair distribution function analysis. Jordan Journal of Physics **Accepted** (2024).

19- Jaafar Jaferh, Fawwaz I. Khalili & Ahmad S. Masadeh (09 Oct 2023): Removal of Th(IV) from groundwater by adsorption onto nano-Kaolin and nano-Kaolin/ MnFe_2O_4 composite, International Journal of Environmental Analytical Chemistry, DOI: 10.1080/03067319.2023.2263385

18- Ahmad S. Masadeh, Moneeb T. M. Shatnawi, Ziad Y. Abu Waar, Gassem M. Alzoubi, Yang Ren. Real space study of local bonding for zinc structure based on temperature-dependent X-ray pair distribution function analysis. AIP Advances 2022; 12 (9): 095313

- 17-** G M. Alzoubi, A.S. Masadeh, M T. M. Shatnawi. Investigation of the structural, morphological, and magnetic properties of smallcrystalline Co-Cu ferrite nanoparticles in the single-domain regime. *AIP Advances* **12**, 065101 (2022).
- 16-** ES Al-Hwaitat, MK Dmour, AS Masadeh, Y Maswadeh, I Bsoul. Effects of pH value and sintering Temperature on the Structural and Magnetic Properties of bariumhexa Ferrites Prepared by Co-Precipitation. *Material Science Research India* **18** (1), 37-47 (2021)
- 15-** N. H.Sa'da, A.S. Masadeh, Observation of structural phase transition in Nd_{0.5}Sr_{0.5}MnO₃ from high real-space-resolution X-ray diffraction. *Phase Transitions* **93** (6), 630-637 (2020)
- 14-** A.S. Masadeh, MTM Shatnawi, G Adawi, Y Ren, Total-scattering pair-distribution function analysis of zinc from high-energy synchrotron data. *Modern Physics Letters B* **33** (33), 1950410 (2019)
- 13-** Ahmad S. Masadeh, Total scattering atomic pair distribution function: new methodology for nanostructure determinations. *Journal Of Experimental Nanoscience*, Vol. 11, Iss. 12, 2016.
- 12-** Ahmad S. Masadeh, Faraj Atassi and Moneeb T. M. Shatnawi. Total Scattering Atomic Pair Distribution Function/ The use of the total scattering atomic pair distribution function methods in pharmaceutical analysis. *Pharmind*, **76**, Nr. 8, 1283-1291 (2014).
- 11-** Xiaohao Yang, Ahmad S. Masadeh, James R. McBride, Emil S. Bozin, Sandra J. Rosenthal and Simon J. L. Billinge. Confirmation of disordered structure of ultrasmall CdSe nanoparticles from X-ray atomic pair distribution function analysis. *Phys.Chem. Chem. Phys.*, **2013**, **15**, 8480.
- 10-** A. S. Masadeh, Investigation of the experimental effects on the quality of the rapid acquisition pair distribution function (RA-PDF) data, *Jordan .J .Phys. ,* **4**, 79-86 (2011).
- 9-** E. S. Božin, A. S. Masadeh, Y. S. Hor, J. F. Mitchell and S. J. L. Billinge, Detailed mapping of the local Ir⁴⁺ dimers through the metal-insulator transitions of CuIr₂S₄thiospinel by x-Ray atomic pair distribution function measurements, *Phys. Rev. Lett.* **106**, 045501 (2011).
- 8-** F Atassi, C Mao, A S. Masadeh, S R. Byrn, Solid-state characterization of amorphous and mesomorphous calcium ketoprofen, *J. Pharm. Sci.* **99**(9):3684-3697 (2010).
- 7-** N G. Jovic, A S. Masadeh, A S. Kremenovic, B V. Antic, J L. Blanuša, N D. Cvjeticanin, G F. Goya, M V, Antisari, and E S. Bozin, Effects of Thermal Annealing on Structural and Magnetic Properties of Lithium Ferrite Nanoparticles, *J. Phys. Chem. C*, **113**, 20559–20567, (2009).
- 6-** Ahmad Salah Masadeh, Quantitative Structure Determination of Nanostructured Materials Using the Atomic Pair Distribution Function Analysis, PhD Thesis, Michigan State University, East Lansing, MI, 2008.
- 5-** A. S. Masadeh, E. Bozin, C. L. Farrow, G. Paglia, P. Juhas, A. Karkamkar, M. G. Kanatzidis and S. J. L. Billinge, Quantitative size-dependent structure and strain determination of CdSe nanoparticles using PDF analysis, *Phys. Rev. B* **76**, 115413 (2007).
- 4-** S. Derakhshan, A. Assoud, K. M. Kleinke, A. S. Masadeh, T. Khaire, S. J. L. Billinge and H. Kleinke, Square net distortion engineering in the ternary variants of titanium antimonide Ti_{2-x}M_xSb (M=ZrHf), *Intermetallics*, **15**, 1071-1077 (2007).
- 3-** S. Brhne, E. Uhrig, K. D. Luther, W. Assmus, M. Brunelli, A. S. Masadeh and S. J. L. Billinge, PDF from X-ray powder diffraction for nanometer-scale atomic structure analysis of quasicrystalline alloys, *Z. Kristallogr.* **220**, 962-967 (2005).
- 2-** S. Brhne, E. Uhrig, C. Gross, W. Assmus, A. S. Masadeh and S. J. L. Billinge, The local atomic quasicrystal structure of the icosahedral Mg₂₅Y₁₁Zn₆₄ alloy, *J. Phys: Condens. Matter* **17**, 1561-1572 (2005).

1- S. Vensky, L. Kienle, R. E. Dinnebier, A. S. Masadeh, S. J. L. Billinge and M. Jansen, The Real structure of Na₃BiO₄ by electron microscopy HR-XRD and PDF analysis, Z. Kristallogr. 220, 231-244 (2005)

Professional Memberships

American Physical Society (APS)

American Chemical Society (ACS)

American Crystallographic Association (ACA)

Materials Research Society (MRS)

Neutron Scattering Society of America (NSSA)