



AHMAD S. MASADEH

Department of Physics
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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:

2013- now: 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.,YarmoukUniversity, 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 **nanostructured 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 orin-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: 8thWorkshop 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 Multierroic 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 CdSenanoparticles

[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 Structureand 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) Techniqueusing data from simple elements.

Publications :

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 **Accepted** (2022).

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 Physic **Accepted** (2022).

1-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).

2- 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)

3-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)

4-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)

5-Ahmad S. Masadeh, Total scattering atomic pair distribution function: new methodology for nanostructure determinations. *Journal Of Experimental Nanoscience*, Vol. 11 , Iss. 12,2016.

6-Ahmad S. Masadeh,FarajAtassiand 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).

7-Xiaohao Yang, Ahmad S. Masadeh, James R. McBride, Emil S. Bozin, Sandra J. Rosenthal and Simon J. L. Billinge. Confirmation of disordered structure of ultrasmallCdSe nanoparticles from X-ray atomic pair distribution function analysis. *Phys.Chem. Chem. Phys.*, 2013, 15, 8480.

8-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).

10- 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).

11-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).

12- 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.

13-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 CdSenanoparticles using PDF analysis, *Phys. Rev. B* 76, 115413 (2007).

14- S. Derakhshan, A. Assoud, K. M. Kleinke, A. S. Masadeh, T. Khaire, S. J. L. Billinge andH. Kleinke, Square net distortion engineering in the ternary variants of titanium antimonideTi_{2-x}M_xSb (M=ZrHf), *Intermetallics*, 15, 1071-1077 (2007).

15-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).

16-. 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).

17-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)