

Curriculum Vitae



Dr. Maen A. Gharaibeh

Professor of Physics

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Education

🏠 Texas Tech University/Lubbock, Tx, U.S.A.

Ph.D. in Physics (Condensed Matter Physics); 2002

"Molecular dynamic simulations of self-interstitials in silicon"

🏠 Yarmouk University/Irbid-Jordan

M.S. in Physics, 1992

"Mossbauer spectroscopic studies of the alloy systems $\text{FeAl}_{1-x}\text{Ti}_x$ and $\text{FeAl}_{1-x}\text{Co}_x$ "

🏠 Yarmouk University/Irbid-Jordan

B.S. in Physics; 1990

Professional experience/Academic Service

✍ Professor of Physics, Jordan University of Science & Technology, Irbid – Jordan Dec. 2022 - Present

Associate Professor of Physics, Jordan University of Science & Technology, Irbid – Jordan Oct. 2010 – Dec. 2022

✍ Chairman: Applied Physical Sciences Department, Sep. 2009 – Sep. 2011

✍ Assistant Dean: Faculty of Science and Arts, Sep. 2007- Sep. 2009.

✍ Assistant Professor of Physics, Jordan University of Science & Technology, Irbid-Jordan, June 2002 – Oct. 2010

Phy101 & 102: General Physics I&II

Phy101A: General Physics for Life Sciences Majors

Phy103: General Physics for Medical Students

Phy105, 106 & 107: General Physics Labs

Phy221: Properties of Matter and Heat Lab

Phy283: Optics Lab

Phy331: Electromagnetic Theory I

Phy332: Electromagnetic Theory II

Phy352: Quantum Mechanics II

Phy353: Modern Physics Lab

Phy440: Atomic Physics

Phy731: Electrodynamics I

Phy744: Atomic and Molecular Physics

Phy791: Seminar

Phy795: Special Topics

✍ Teaching Assistant, Jordan University of Science and Technology, Irbid-Jordan, 1993- 1997

Master Students Supervision

1. Ali Almahmoud "Magnetic Properties of Mixed Spin (1,1/2) Ising Model on a Honeycomb-Hexagonal Structure by Monte Carlo simulation." **(Advisor)**
2. ABEER ALROUSAN "Studying Structural, Electronic, Magnetic, and thermomagnetic Properties of Co₂TiSi, Co₂TiAl, Co₂TiGa Full Heusler Alloys Using Density Functional Theory and Monte Carlo Simulation". **(Advisor)**
3. Azzam Almahasses "Free energy differences of Ethanol Trappe model using the Benett Acceptance Ratio" **(Advisor)**

4. Amer Almahmoud "Studying Structural, Electronic, Magnetic, and Thermomagnetic Properties of Doped Full Heusler Alloys Using Density Functional Theory and Monte Carlo Simulation" **(Advisor)**
5. Rama Abu Haifa "Crystalline Field Effect on Magnetic and Thermodynamic Properties of a Ferrimagnetic Centered Rectangular Structure, 2021 **(Advisor)**
6. Ali Mohammad Ali Almahmoud "Magnetic Properties of Mixed Spin (1, 1/2) Ising Model on a Honeycomb-Hexagonal Structure by Monte Carlo Simulation, 2021 **(Advisor)**
7. Hadeel Ali Abu-Lahim "*Numerical Simulation on the Role of Nano-Sized Pinning Centers and Temperature on the critical Current in High Temperature superconductors.*" 2011 **(Co-Advisor)**
8. Safwan Qasim Jaradat " *Binary nucleation Rates of Water – Ethanol Using SAFT Equation of State*" 2010 **(Co-advisor)**
9. Wedad Mohammad Alawawdeh: "*Effect of particle size distribution on the magnetization of ferrofluid*", 2010 **(Advisor)**
10. Manal Mahmoud Al-Ali: "*Evolution of the current as a function of time in a simple electric circuit consists of an electric current source on a resistor*", 2009 **(Co-Advisor)**
11. Diaa Al Haq al Samarah: "*Effect of anisotropy in one-dimensional trimer model of ferro-fluid*", 2008 **(Advisor)**
12. Wesam Mustafa Al-Sharo'a: "*Effect of anisotropy in two-dimensional ferro-fluids using dimmer model*", 2008 **(Co-Advisor)**
13. Noura Ibrahim Al-Zoubi: "*Nucleation rates of ethanol and methanol using an equation of state*", 2006. **(Co- Advisor).**
14. Raed Abdelmajeed Abdalrheem: "*Piezoelectric properties of Ga_{0.25}Sc_{0.75}N and Ga_{0.75}Sc_{0.25}N alloys*", 2005 **(Co-Advisor)**

Master Theses Examining Committees

1. Samah Alqaiem: "Magnetic Properties of a Triangular Ferrimagnetic Nanotube with Core-Shell Structure using Monte Carlo Simulation", 2020
2. Zain Alzoubi: "Free Energy Differences of OPC Water and Heavy Water Models using Monte Carlo Simulation", 2020
3. Myassar Hammouri: "The Free Energy Differences of SPC/E Water Model by Monte Carlo Simulation", 2017
4. Reham Momani: "Solving Inhomogeneous Nonlinear Differential Functions using the Adomian Decomposition Functions", 2016
5. Huda Hadad: "*Magneto transport*", 2010
6. Waseem Hatamleh: "*Pinning Forces in High temperature Superconductors*", 2006
7. Fawaz Hrahsheh: "*Nucleation rates of ethanol methanol using SAFT and PC-SAFT equation of states*", 2006
8. Dima Ahmad Safadi: "*The effect of anisotropy in dimmer model on ferrofluids in one dimension*", 2006

Publications:

- [1] A Obeidat, A Almahmoud, H Alkhalidi, M Gharaibeh, International Journal of Hydrogen Energy 153, 150286 (2025).
- [2] M Gharaibeh, A Almahmoud, A Almahmoud, A Obeidat, Scientific Reports 15 (1), 5144 (2025).
- [3] A Almahmoud, A Almahmoud, A Obeidat, M Gharaibeh. International Journal of Quantum Chemistry 125 (3), e70013 (2025).
- [4] B Aladerah, A Obeidat, M Gharaibeh, AMM Rawashdeh. Physica B: Condensed Matter 695, 416500 (2024)
- [5] B Aladerah, A Alrousan, M Gharaibeh, A Obeidat. Materials Research Express 11 (3), 036504 (2024)
- [6] B Aladerah, M Gharaibeh, A Obeidat. Physica Scripta 98 (12), 125939 (2023)
- [7] B Aladerah, M Gharaibeh, A Obeidat, K Aledealat. Physica Scripta. (2023)

- [8] Indian Journal of Physics 97 (7), 1997-2005A. Obeidat, B. Aladerah, **M. Gharaibeh**, K. Aledealat, Magnetism and magnetic properties of 3d transition metal monolayer on Pd (1 0 0), J. Magn. Magn. Mater., 585 (2023) 171116.
- [9] **M. Gharaibeh**, R. Abu Haifa, A. Obeidat, Crystalline field effects on magnetic and thermodynamic properties of a ferrimagnetic-centered rectangular structure, Indian Journal of Physics, 97 (2023) 1997-2005.
- [10] B. Aladerah, **M. Gharaibeh**, A. Obeidat, K. Aledealat, A comparative study of structural, electronic, magnetic, and pressure-dependent properties of Full-Heusler Fe₂XSi (X= Mn and Co): First-principles calculation and Monte Carlo Simulation, Phys. Scr., (2023).
- [11] B. Aladerah, **M. Gharaibeh**, A. Obeidat, Influence of substitutional defects on the structural and magnetic properties of barium hexaferrites, Phys. Scr., 98 (2023) 125939.
- [12] A. Al-Qawasmeh, M. Badarneh, A. Obeidat, **M. Gharaibeh**, Magnetic properties and phase diagrams of Ising mixed spin (1-1/2-1) Multilayer's system with hexagonal structure: A Monte Carlo study, Phys. B: Condens. Matter, 643 (2022) 414170.
- [13] **M. Gharaibeh**, R. Abu Haifa, A. Obeidat, Crystalline Field Effects on Magnetic and Thermodynamic properties of a Ferrimagnetic Centered Rectangular Structure, Indian Journal of Physics 2022
- [14] **M. Gharaibeh**, A. Almahmoud, A. Obeidat, Compensation and Critical Behavior of Mixed Spin-1 and Spin-1/2 Ising Model on a Centered Honeycomb-Hexagonal Structure, SN Applied Sciences 4 (8) (2022), 1-9
- [15] A. Al-Qawasmeh, A. Obeidat, S. Abedrabbo, **M. Gharaibeh**, Magnetic properties and phase diagrams of Ising mixed spin (1-1/2-1) three layers system of hexagonal structure: A Monte Carlo study, Physica A: Statistical Mechanics and its Applications Physica B: Condensed Matter 643 (2022), 414170
- [16] **M. Gharaibeh**, A. Al-Qawasmeh, A. Obeidat, S. Abedrabbo, Effect of crystal field on the magnetic and thermodynamic properties of the Ising mixed spin (1-1/2-1) three layers system of cubic structure, Physica B: Condensed Matter 630 (2022), 4136482021.
- [17] K. Aledealat, B. Aladerah, A. Obeidat, **M. Gharaibeh**, First-principles study of electronic structure and magnetic properties of L10-ordered FeNi, FePd, and FePt alloys, Heliyon, 7 (2021) e08639.
- [18] **M. Gharaibeh**, M.H.A. Badarneh, S. Alqaiem, A. Obeidat, M.-K. Qaseer, Magnetic properties and phase diagrams of mixed spin-1 and spin-1/2 Ising model on a checkerboard square structure: A Monte Carlo study, Journal of Magnetism and Magnetic Materials, 540 (2021) 168458.

- [19] **M. Gharaibeh**, S. Alqaiem, A. Obeidat, A. Al-Qawasmeh, S. Abedrabbo, M.H.A. Badarneh, Magnetic properties of the ferrimagnetic triangular nanotube with core-shell structure: A Monte Carlo study, *Physica A: Statistical Mechanics and its Applications*, 584 (2021) 126394.
- [20] **M. Gharaibeh**, A. Obeidat, M.-K. Qaseer, M. Badarneh, Compensation and critical behavior of Ising mixed spin (1-1/2-1) three layers system of cubic structure, *Physica A: Statistical Mechanics and its Applications*, (2020) 124147.
- [21] **M. Gharaibeh**, A. Obeidat, W. Al Awawdeh, A. Rousan, Effect of Particle Size Distribution on the Magnetization of Ferrofluid, *Experimental and Theoretical NANOTECHNOLOGY*, 3 (2019) 1-11.
- [22] K. Aledealat, A. Obeidat, **M. Gharaibeh**, A. Jaradat, K. Khasawinah, M.-K. Hasan, A. Rousan, Dynamics of Duffing-Holmes oscillator with fractional order nonlinearity, *The European Physical Journal B*, 92 (2019) 233.
- [23] A. Jaradat, A. Obeidat, **M. Gharaibeh**, M.H. Qaseer, Adomian decomposition approach to solve the simple harmonic quantum oscillator, *Int. J. Appl. Eng. Res*, 13 (2018) 1056-1059.
- [24] K. Aledealat, K. Khasawinah, A. Obeidat, **M. Gharaibeh**, A. Jaradat, M. Hasan, A. Rousan, Sensitive detection schemes for small variations in the damping coefficient based on the Duffing-Holmes oscillator with a potential application in magnetic sensing, *AIP Advances*, 8 (2018) 095102.
- [25] A. Jaradat, A. Obeidat, **M. Gharaibeh**, K. Aledealat, K. Khasawinah, M. Qaseer, A. Rousan, Simple harmonic oscillator with fractional electric potential, *Revista mexicana de física*, 63 (2017) 1-5.
- [26] K. Aledealat, A. Obeidat, **M. Gharaibeh**, A. Jaradat, K. Khasawinah, M. Qaseer, A.A. Rousan, EVOLUTION OF BOUND AND SCATTERING STATES IN FRACTIONAL HEAVISIDE STEP-DIRAC DELTA FUNCTION POTENTIALS, *UNIVERSITY POLITEHNICA OF BUCHAREST SCIENTIFIC BULLETIN-SERIES A-APPLIED MATHEMATICS AND PHYSICS*, 79 (2017) 205-212.
- [27] A.A. Obeidat, **M.A. Gharaibeh**, D.H. Al Samarh, M.H. Qaseer, N.Y. Ayoub, Effect of Magnetostatic Dipoles Interaction on the Initial Susceptibility of a Dilute Ferrofluid in One Dimension, *Journal of superconductivity and novel magnetism*, 24 (2011) 1911-1916.
- [28] A. Obeidat, **M. Gharaibeh**, W. Al-Sharao, D. Al Samarh, M. Qaseer, N. Ayoub, Effect of magnetic anisotropy on the two dimensional dimer model in ferrofluids, *Int. J. Nanoelectronics and Materials*, 4 (2011) 27-35.
- [29] A. Obeidat, **M. Gharaibeh**, M. Al-Ali, A. Rousan, Evolution of a current in a resistor, *Fractional calculus and applied analysis*, 14 (2011) 247-259.

- [30] I. Obaidat, B. Albiss, H. Ghamlouche, S. Obeidat, T. Qarqaz, **M. Gharaibeh**, A. Obeidat, M. Hasan, The role of Fe₃O₄ nanoparticles on superconductivity, *Journal of Nanoengineering and Nanomanufacturing*, 1 (2011) 84-92.
- [31] A. Obeidat, **M. Gharaibeh**, H. Ghanem, F. Hrahsheh, N. Al-Zoubi, G. Wilemski, Nucleation Rates of Methanol Using the SAFT-0 Equation of State, *ChemPhysChem*, 11 (2010) 3987-3995.
- [32] **M. Gharaibeh**, A. Obeidat, D. Al-Samarh, M. Qaseer, N. Ayoub, Effect of magnetic anisotropy on a one-dimensional system of magnetic particles, *Jordan Journal of Physics*, 3 (2010) 17-24.
- [33] **M. Gharaibeh**, B. Albiss, I. Jumah, I. Obaidat, Effective incorporation of nanocerium into polycrystalline MgB₂, *Journal of Applied Physics*, 107 (2010) 063908.
- [34] B. Albiss, I. Obaidat, **M. Gharaibeh**, H. Ghamlouche, S. Obeidat, Impact of addition of magnetic nanoparticles on vortex pinning and microstructure properties of Bi–Sr–Ca–Cu–O superconductor, *Solid State Communications*, 150 (2010) 1542-1547.
- [35] B. Albiss, N. Al-Rawashdeh, A.A. Jabal, **M. Gharaibeh**, I. Obaidat, M. Hasan, K. Azez, Polycrystalline YBa₂Cu₃O_{7-δ} with Nano-sized Al₂O₃ Inclusions, *Journal of superconductivity and novel magnetism*, 23 (2010) 1333-1340.
- [36] A. Obeidat, **M. Gharaibeh**, D. Al-Safadi, D. Al Samarh, M. Qaseer, N. Ayoub, Anisotropic and Particle-Particle Interaction Effect in a One-Dimensional System of Magnetic Particles, *Journal of superconductivity and novel magnetism*, 22 (2009) 805.
- [37] I. Obaidat, **M. Gharaibeh**, B. Albiss, M. Hasan, Vortex Creep Perpendicular to the c-AXIS in Crystalline and Grain-Oriented Ybco Superconductor, *International Journal of Modern Physics B*, 23 (2009) 673-678.
- [38] I. Obaidat, B. Albiss, **M. Gharaibeh**, M. Hasan, Enhancing the pinning strengths in polycrystalline MgB₂, *Crystal Research and Technology: Journal of Experimental and Industrial Crystallography*, 44 (2009) 281-285.
- [39] I. Obaidat, B. Albiss, H. Claus, **M. Gharaibeh**, M. Hasan, The influence of Pb-ion irradiation on melt-textured YBa₂Cu₃O_x crystals, *Crystal Research and Technology: Journal of Experimental and Industrial Crystallography*, 44 (2009) 206-210.
- [40] **M. Gharaibeh**, I. Obaidat, B. Albiss, M. Hasan, Enhancing the transport properties of polycrystalline MgB₂ superconductors, in: *Journal of Physics: Conference Series*, IOP Publishing, 2009, pp. 012010.
- [41] B. Albiss, I. Obaidat, **M. Gharaibeh**, W. Hatamleh, S. Barhoum, M. Hasan, Magneto-transport properties of polycrystalline YBa₂(Cu_{1-x}M_x)₃O_{7-δ} (M= B

and Mn), Crystal Research and Technology: Journal of Experimental and Industrial Crystallography, 44 (2009) 930-936.

- [42] I. Obaidat, B. Albiss, H. Claus, **M. Gharaibeh**, M. Hasan, The influence of Pb-ion irradiation on melt-textured YBa {sub 2} Cu {sub 3} O {sub x} crystals, Cryst. Res. Technol., 44 (2008).
- [43] B. Albiss, **M. Gharaibeh**, I. Obaidat, N. Al-Rawashdeh, R. Oweis, N. Hamdi, M.H. Qaseer, Magnetotransport and structural properties of superconducting BPSCCO thick film on MgO substrate, physica status solidi (a), 205 (2008) 1851-1854.
- [44] **M. Gharaibeh**, S. Estreicher, P. Fedders, P. Ordejón, Self-interstitial–hydrogen complexes in Si, Physical Review B, 64 (2001) 235211.
- [45] **M. Gharaibeh**, S. Estreicher, P. Fedders, Dynamics of Si self-interstitial clustering using the fast-diffusing I3 cluster, Physica B: Condensed Matter, 308 (2001) 510-512.
- [46] S. Estreicher, **M. Gharaibeh**, P. Fedders, P. Ordejón, Unexpected dynamics for self-interstitial clusters in silicon, Physical review letters, 86 (2001) 1247.
- [47] J. Hastings, **M. Gharaibeh**, S.K. Estreicher, P. Fedders, Hydrogen interactions with intrinsic defects in silicon, Physica B: Condensed Matter, 273 (1999) 216-219.
- [48] **M. Gharaibeh**, S. Estreicher, P. Fedders, Molecular-dynamics studies of self-interstitial aggregates in Si, Physica B: Condensed Matter, 273 (1999) 532-534.
- [49] S.H. Mahmood, **M.A. Gharaibeh**, A.S. Saleh, Mössbauer and structural studies of FeAl_{1-x}Ti_x, Solid state communications, 95 (1995) 263-266.
- [50] S.H. Mahmood, **M.A. Gharaibeh**, H. Abu-Safia, A.S. Saleh, Mössbauer spectroscopic study of FeAl_{1-x}Co_x, Hyperfine Interactions, 77 (1993) 255-264.

Projects and Grants:

- Self-interstitial-hydrogen complexes in silicon, 2003
- Effect of particle size distribution on the magnetization of ferrofluid, 2008
- Effect of anisotropy in one-dimensional trimer model of ferro-fluid, 2007
- Density functional modeling of point defects in semiconductors, 2009
- Effect of fractional stiffness on Helmholtz-Duffing system, 2018

- Magnetic properties studies of a three layers Ising system using Monte-Carlo simulations, 2020