



# Abdalla A. Obeidat

Jordan University of Science & Technology  
Irbid Al-Ramtha  
Department of Physics  
Irbid, 22110  
Tel:+962 (02) 271000 ext:23432  
Mobile:+962 (79)8092150  
aobeidat@just.edu.edu  
<http://www.just.edu.jo/~aobeidat/>

## Education

Aug.1998-Dec.2003 <b>PhD, Physics</b> <b>Minor: Computer Science</b>	<b>Missouri University of Science &amp; technology</b> <b>Advisor:</b> Dr. G. Wilemski, <b>Thesis Title:</b> Nucleation Rates Using Equations of State	Rolla, Missouri
May.1992-Dec.1994 <b>M.Sc., Physics</b>	<b>Yarmouk University</b> <b>Advisor:</b> Dr. N. Ayoub, <b>Thesis Title:</b> Comparison Between Experimental and Theoretical Studies on an Interacting Fine Particle System	Irbid, Jordan
Aug.1988-May.1992 <b>B.Sc., Physics</b> <b>Minor: Mathematics</b>	<b>Yarmouk University</b> Physics	Irbid, Jordan

## Committees

Aug.2013-Aug.2015	<b>Chairman of Physics Department</b>
Aug.2008-Aug.2009	<b>Faculty of science and arts representative in university council</b>
Aug.2007-Aug.2008	<b>Department representative in faculty of science and arts council</b>

## Teaching Experience

Feb.2013-present	<b>Jordan University of Science &amp; technology</b>	Irbid, Jordan
Jan.2013-May.2013	<b>Missouri University of Science &amp; technology</b>	Rolla, MO, USA
Feb.2004-May.2012	<b>Jordan University of Science &amp; technology</b>	Irbid, Jordan
Aug.2001-May.2002	<b>Missouri University of Science &amp; technology</b> TA: Lab-Phys. 23 & 24	Rolla, MO, USA
Jan.1995-Dec.1997	<b>Jordan University of Science &amp; technology</b>	Irbid, Jordan
Aug.1993-May.1994	<b>Yarmouk University</b> TA: Lab-Phys. 105 & 106	Irbid, Jordan

## Undergraduate courses

General Physics with emphasis on mechanics and electricity (phys101,phys102)  
General Physics for Biology with emphasis on mechanics, electricity, Fluids, Optics, and Modern Physics (phys101A,phys102A)  
General Physics with emphasis on mechanics, electricity, Fluids(phys 103)  
General Physics labs with emphasis on mechanics, electricity (phys 105, phys106, and phys 107)  
Introduction to Mathematical Physics (phys 200)  
Mathematical Physics I (phys 201)  
Modern Physics lab (phys 253)  
Optics lab (phys 283)  
Mathematical Physics II (phys 301)  
Computational Physics (phys 303)

Classical Mechanics II (phys 312)  
 Electrodynamics I (phys 331)  
 Quantum Mechanics I (phys 351)  
 Quantum Mechanics II (phys 352)  
 Statistical Mechanics (phys 461)  
 Special Topics with emphasis on residue theorem and atomic physics (phys 495)

**Graduate courses**

Mathematical Physics (phys 701)  
 Computational Physics (phys 704)  
 Classical Mechanics (phys 711)  
 Electrodynamics (phys 731)  
 Magnetism and Magnetic Materials (phys 733)  
 Quantum Mechanics I (phys 751)  
 Quantum Mechanics II (phys 752)  
 Statistical Mechanics (phys 761)  
 Solid State Physics (phys 771)  
 Special Topics with emphasis on Nucleation Theory (phys 795)  
 Special Topics with emphasis on Magnetic Ferrofluids (phys 795)

**Research Experience**

Aug.2013-present	<b>Jordan University of Science &amp; technology</b>	Irbid, Jordan
<b>Fields</b>	<ul style="list-style-type: none"> <li>- Magnetic properties of Heusler alloys using density functional theory</li> <li>- Magnetic properties of Hexaferrite using density functional theory</li> <li>- Structure and dynamics of Water and Alcohol Using Molecular Dynamics Using Gromacs Package</li> <li>- Free energy of water and Alcohol using BAR with Monte-Carlo Simulations</li> <li>- Magnetic Properties, Critical and Compensation Temperatures in Mixed Ising and XY spins</li> </ul> <p>Ferrimagnetic Hexagonal Structure Using Monte Carlo Simulation</p> <ul style="list-style-type: none"> <li>- Solving Linear and non-linear Differential Equations Using the Adomian Decomposition Method</li> <li>- Solving Schrodinger Equation Fractionally</li> </ul>	
Jun.2012-Aug.2013	<b>Missouri University of Science &amp; technology</b>	Rolla, MO, USA
<b>Fields</b>	<ul style="list-style-type: none"> <li>- Structure of Binary Droplet Mixtures of Water-Pentanol using Density Functional Theory</li> <li>- Molecular Dynamics of Aqueous Organic Nanodroplets Using Gromacs Package</li> <li>- Multicomponent Droplet Formation and Growth in the Ternary Water-Nonane-Methane system</li> </ul>	
Feb.2004-May.2012	<b>Jordan University of Science &amp; technology</b>	Irbid, Jordan
<b>Fields</b>	<ul style="list-style-type: none"> <li>- Mathematical Models for the Curie Temperature of ferromagnetic Materials</li> <li>- Mathematical Models for the Nucleation Rates of general Fluids</li> <li>- Performed Studies on the Nucleation and Density Distribution of General fluids</li> <li>- Applying Fractional Calculus in Electricity and Magnetism with emphasis on the Motion of the Domain Walls inside the Ferromagnetic Materials</li> <li>- Measuring the Conductivity of prepared Polymer Materials using Low Frequency Analyzer</li> </ul>	
May.1998-Dec.2004	<b>Missouri University of Science &amp; technology</b>	Rolla, MO, USA
<b>Fields</b>	<ul style="list-style-type: none"> <li>-Computer Modeling on Landau-Zener Effect</li> <li>-Investigating the Oscillations between the two-electron Bound States in Calcium</li> <li>-Investigated Small Angle Neutron Scattering (SANS) on the Nucleation of Water and Alcohol at NIST</li> </ul>	

- Studied, in Atomic Physics, the Scattering on the (e,2e) Models of Xenon
- Technical Experience: Preparing Dye Lasers*

## Research Funds

May.2005-May.2018	<b>Jordan University of Science &amp; technology</b>	Irbid, Jordan
	- Dielectric and Optical Properties of doped nano-tubes, Graphene and Carbon Black in Polystyrene Matrix using Molecular Dynamics	\$8,000
	- Magnetic Properties of Mixing Ising model in Two - Dimensions using Monte-Carlo Simulations	\$7,000
	- Effect of Hydrogen and Nitrogen and Oxygen on Electronic Properties of Silicon (DFT)	\$20,000
	- Investigating the defects on semi-conductors using Density Functional Theory (DFT) by using Seista and Gaussian	\$20,000
	- Studying the effect of nano-particle addition on superconductors like YBCO and MgB <sub>2</sub>	\$18,000
	- Effect of Hydrogen and Nitrogen and Oxygen on Electronic Properties of Silicon	\$14,000
	- Studying the magneto transport properties of superconductors using LabVIEW	\$10,000
	- Density Functional modeling of Point defects in Semiconductors	\$7,500
	- Surface Tension Calculations of Water+Alcohol Binary System using Molecular Dynamics	\$6,500
	- Applying Gradient Theory (GT) to study the unary nucleation rates of general fluids	\$1,800
	- Applying Molecular Dynamics (MD) on the effect of vortex-vortex interaction in type II superconductors	
	- Applying Monte-Carlo (MC) technique to study the magnetic properties of some ferromagnetic materials	

## Dissertations

### As an Advisor

18. Magnetic Properties of a Triangular Ferrimagnetic Nanotube with Core-Shell Structure using Monte-Carlo Simulation (Samah Alqaiem) 2020
17. Free Energy Differences of OPC Water and Heavy Water Models using Monte Carlo Simulations (MC) (Zain Alzoubi) 2020
16. Non-linear Fractional Oscillation Systems: A Set of Numerical Schemes (Mohammad Abdulrazaq) 2018
15. The Magnetic Properties of a Centered Rectangular Lattice with Mixed Spins Using XY-Model (Nermeen Alzoubi) 2018
14. Molecular Dynamics Studies on the Structure of Methanol Models and Dynamics of Methanol and Ethanol-Water Mixtures (Rakan Alsalman) 2018
13. Monte-Carlo Simulations on Mixed Ising Ferrite of two Square Sub-Lattices (Badarneh) 2017
12. Effect of cut-Off Radius on Surface Tension of Methanol (Bushra Hamdan) 2016
11. Solving Coupled Harmonic Oscillators Fractionally (Ayat Jaradat) 2016
10. Solving Inhomogeneous nonlinear Differential Equation in Terms of Orthogonal Functions using Adomian Decomposition Method (Reham Almomani) 2016
9. Dielectric Properties of nano BaTiO<sub>3</sub>(Raghda Albaid) 2012
8. Numerical Simulation on the Rule of nano-sized Pinning Centers and Temperature on the critical Current in high Temperature Superconductors (Hadeel AbuLahem) 2011
7. Binary Nucleation Rates of Water-Ethanol using SAFT Equation of State (Safwan Jaradat) 2010
6. Studying the Magneto transport Properties of Superconductors using LabVIEW (Huda Haddad) 2010
5. Evolution of the Current as a Function of Time in Simple Electric Circuit Consists of an Electric Current Source and a Resistor (Manal) Alali 2009
4. Effect of Anisotropy in Two-Dimensional Ferro-Fluids Using Dimer Model (Wesam Alsharoha) 2008
3. Nucleation Rates of Ethanol and Methanol using SAFT and PC-SAFT Equations of State (Fawaz Harahsheh) 2006
2. Nucleation Rates of Ethanol and Methanol using an Equations of State (Noura Alzoubi) 2006
1. Anisotropic and Particle-Particle Effect in Ferrofluid System of Magnetic Particles (Deema Alsafadi) 2005

### *As an Co-Advisor*

15. Studying Structural, Electronic, Magnetic, and Thermomagnetic Properties of Doped Full Heusler Alloys Using Density Functional Theory and Monte Carlo Simulation (Amer Al-Mahmoud) 2024
14. Free energy differences of Ethanol Trappe model using the Benett Acceptance Ratio (Azzam Mahasees) 2024
13. Investigating the structural and dynamic properties of binary systems of Butanol+ Acetone and Ethanol and Ethanol + Acetone through Molecular Dynamic Simulation (Farah Al-Hourani) 2024
12. Superconductivity of MgB<sub>2</sub>-Like Structures : First-Principle Calculations (Muhanad Wehada) 2023
11. Computational investigations on the thermodynamic, structure, and dynamic of the binary 1-propanol/water systems at temperatures from 245K to 298K (Asia Al-Nadi) 2023
10. Studying Structural, Electronic, Magnetic, and Thermomagnetic Properties of Co<sub>2</sub>TiSi, Co<sub>2</sub>TiAl, Co<sub>2</sub>TiGa Full Heusler Alloys Using Density Functional Theory and Monte Carlo Simulation (Abeer Al-Rousan) 2023
9. Structural, Electronic, Magnetic, and Thermomagnetic Properties of Fe<sub>2</sub>CoSi<sub>1-x</sub>Al<sub>x</sub> (x = 0, 0.25, 0.5, 0.75, 1) Full Heusler Alloy: Density Functional Theory and Monte Carlo Simulation (Ahmad Jawarneh) 2023
8. Crystalline Field Effects on Magnetic and Thermodynamic Properties of Ferrimagnetic Ferrimagnetic Centered Rectangular Structure (Rama Abu-Haifa) 2023
7. Structural, Electronic, and magnetic Properties of FeCoPt<sub>2</sub>, FeNiPt<sub>2</sub>, and CoNiPt<sub>2</sub> Alloys: Density Functional theory and Monte Carlo Simulations (Ammar Almnayyes) 2022
6. Magnetic Properties of Mixed Spin (1, 1/2) Ising Model on a Honeycomb-Hexagonal Structure by Monte Carlo Simulation (Ali Al-Zoubi) 2022
5. First Principles Study of Iron, Cobalt and Nickel Defects in Silicon (Bilal Aladreh) 2021
4. The Effect of Size of Magnetic Clusters on the Magnetic Properties of the Composite of Magnetite with Functionalized Poly Vinyl Alcohol (Basemah Mahasneh) 2011
3. Parallel Implementation of Runge-Kutta for the Solution of Systems of Differential Equations (asma Almomani) 2011
2. Effect of Particle Size Distribution on a Chain of Ferromagnetic Particles (Wedad Awawdeh) 2010
1. Effect of Anisotropy in One Dimension Trimer Model Ferrofluids (Dia Samarah) 2007

### *As a member*

8. Electronic properties of kinked boron nitride monolayer under tensile compression: density functional theory (Mahmoud Ouroud) 2022
7. First Principle Calculations Of The Vibrational And Thermal Properties Of BeF<sub>2</sub> And ZnF<sub>2</sub> 2022
6. Double effect of vacancies and tensile strength on the electronic properties of double walled boron nitride nanotube (Alaa Alhamarsheh) 2022
5. Optical properties of wavy boron nitride monolayer: simulation study (Mohammad S. AL-mashaqbeh ) 2022
4. Optical properties of kinked graphene: Simulation study (Zaid Musalam) 2021
3. The Effect of the Size and Type of Carbon nano-fillers on the Optical and Dielectric Properties of Polystyrene Composites (Hind AbuGhazleh) 2016
2. Approximate Solutions for Systems of Integro-Differential Equations with Applications to Biological Sciences (Alaa Altani) 2009
1. AC and DC Electrical Conductivity Measurements of the Polyaniline-doped with Copper (I) X Salts, {Cu(I)X (X=Cl,Br,I)} as a potential gas sensors (Mahmoud Alomari) 2006

### **Conference Contributions**

21. APS March Meeting 2023, Las Vegas, NV, USA, Nucleation rates of OPC3-water and SPCE/hw-heavy-water systems using Monte-Carlo simulations with the aid of the Bennett Acceptance ratio March, 2023
20. APS March Meeting 2022, Chicago, IL, USA, First-principles study of electronic structure and magnetic properties of L10-ordered FeNi, FePd, and FePt alloys March, 2022

19. APS April Meeting 2019, Denver, CO, USA, ‘Structural Properties of water-propanol ‘ system using molecular dynamics‘ April, 2019
18. APS April Meeting 2018, Columbus, OH, USA, ‘Thermodynamic Properties of ‘ Alcohols Using Molecular Dynamics Simulations‘ April, 2018
17. APS March Meeting 2017, New Orleans, LA, USA, ‘Surface Tension of Alcohol-Water Mixtures using Molecular Dynamics‘ March, 2017
16. APS March Meeting 2016, Baltimore, MD, USA, ‘Surface Tension of Methanol as a Function of cut-off Radius and Temperature controller‘ March, 2016
15. APS April Meeting 2015, Baltimore, MD, USA, ‘Molecular Dynamic Simulation on Surface Tension of Methanol‘ April, 2015
14. ICNAA 2013, Colorado State University, MD, USA, ‘Free Energy of Formation of small Clusters Using the BAR method and MD Simulations‘ June, 2013
13. APS March Meeting 2013, Baltimore, MD, USA, ‘Interpreting SAXS spectra of non-spherical nonane-water nanodroplets using a new particle form factor‘ March, 2013
12. 2012 SIAM Annual Meeting (AN12) and the SIAM Conference on Financial Mathematics and Engineering (FM12) in Minneapolis, Minnesota, USA ‘Application of fractional Calculus to Domain Wall Motion‘ July, 2012
11. AMS Spring Eastern Sectional Meeting, George Washington University, Washington, DC, USA ‘Application of fractional Calculus to Gravity‘ March, 2012
10. APS March Meeting 2011, Dallas, TX, USA, ‘Molecular dynamic simulation on the rule of the defect size on critical current at low temperature‘ March, 2011
9. APS March Meeting 2011, Dallas, TX, USA ‘Scaling of nonclassical Nucleation rates of Methanol‘ March, 2011
8. APS March Meeting 2010, Washington, DC, USA ‘Nucleation rates of ethanol and methanol using and equation of state‘ March, 2010
7. CPMS 2009, Alexandria, the 3<sup>rd</sup> conference on physics and material sciences ‘the effect of magneto-static dipoles interaction on the initial susceptibility of a dilute‘ ferrofluid in one dimension‘ November, 2009
6. APS 2009, Annual March Meeting, Pittsburg, PA, USA ‘Effect of anisotropy in two dimensional ferrofluids March, 2009
5. The International Conference on Materials, Prince Sumia University, Jordan 2009
- ICME 2008, International Conference on Superconductivity and Magnetism, Antalya, Turkey ‘Anisotropic effect on magnetic ferrofluids‘ April, 2008
4. The International Conference on Nuclear, Yarmouk University, Jordan 2008
- Nucleation and Atmospheric Aerosols 2004: 16<sup>th</sup> International Conference, Koyoto, Japan ‘Binary Nucleation of nonideal system from classical and density functional theories‘ July, 2004
3. APS 2003, Annual March Meeting, Atlanta, GA, USA ‘Nucleation rates of water and heavy water‘ March, 2003
2. APS 2001, Annual March Meeting, Seattle, WA, USA ‘Nucleation rates of general fluids using Van der Walls equation of state‘ March, 2001
1. Nucleation and Atmospheric Aerosols 2000: 13<sup>th</sup> International Conference, Rolla, MO, USA 2000

## Collaborations

- Prof. Dr. Gerald Wilemski, Missouri University of Science and Technology MS&T, USA
- Prof. Dr. Nabil Ayoub, German Jordanian University GJU, Jordan
- Prof. Dr. Mohammad Qaseer, Jordan university of Science and Technology JUST, Jordan
- Prof. Dr. Akram Al Rousan JUST, Jordan
- Prof. Dr. Ihab Obeidat, United Arab Emirates University at Al Ain UAEA, UAE
- Dr. Hassan El-Ghanem JUST, Jordan
- Dr. Isam Arafah, Chemistry department JUST, Jordan

- |  |              |
|--|--------------|
| - Dr. Maen Gharaibeh                               | JUST, Jordan |
| - Dr. Adnan Jaradat                                | JUST, Jordan |
| - Dr. Khalid Aledealat                             | JUST, Jordan |
| - Dr. Khitam Khasawneh, Yarmouk University         | YU, Jordan   |
| - Dr. Abdel-Mone'm Rawashdeh, Chemistry department | YU, Jordan   |

### Workshops

- |  |      |
|--|------|
| - First Yarmouk School for Computational Condensed Matter and Nano Systems, YU | 2010 |
| - Modern University Instructional Methods, JUST                                | 2010 |
| - Computational Physics using WEIN2K Package, YU                               | 2009 |
| - Social Studies and Teaching Methods, JUST                                    | 2005 |

Refereed Research  
Articles

62. Bilal Aladerah, **Abdalla Obeidat**, Mohammad-Khair Qaseer, Abdel-Monem M Rawashdeh, *Influence of structural modifications on mechanical and magnetic properties of Co<sub>2</sub>FeGa full Heusler alloys: A comparative study on L21 and XA structures*. Physica B: Condensed Matter, 2024. p. 415829.
61. Bilal Aladerah, Abeer Alrousan, Maen Gharaibeh, **Abdalla Obeidat**, *Exploring the thermomagnetic behavior of Co<sub>2</sub>TiZ (Z=Al, Si, Ga, Ge, and Sn) alloys: a computational study*. Materials Research Express, 2024. p. 036504.
60. Bilal Aladerah, **Abdalla Obeidat**, Khaled Aledealat, *A Computational exploration of the electronic, mechanical, and magnetic properties of Co<sub>2</sub>A<sub>1-x</sub>B<sub>x</sub>Al full heusler alloys (A, B =Cr, Mn, and Fe)*. Materials Today Communications, 2024. p. 108378.
59. Bilal Aladerah, **Abdalla Obeidat**, *Pressure-dependent magnetic properties of FeNi alloy: Theoretical study*. Solid State Sciences, 2024. p. 107437.
58. Adnan Jaradat, Rakan Al-Salman, **Abdalla Obeidat**, *Molecular dynamics simulation of vapor-liquid equilibrium in 1-alkanol unary systems: a study of surface tension, density, and vapor pressure of TraPPE-UA force field*. Fluid Phase Equilibria, 2024. p. 113967.
57. Bilal Aladerah, Maen Gharaibeh, **Abdalla Obeidat**, *Influence of Substitutional Defects on the Structural and Magnetic Properties of Barium Hexaferrites*. Physica Scripta, 2023. p. 125939.
56. Ahmad Al-Qawasmeh, MH Badarneh, Samah Alqaiem, **Abdalla Obeidat**, *Influence of surface-interface roughness on magnetic thin films critical and hysteresis behaviors*. Micro and Nanostructures, 2023. p. 207690.
55. Khaled Aledealat, Ahmad Jawarneh, Bilal Al-Aderah, **Abdalla Obeidat**, *Influence of Al and Si concentration on the structural, electronic, magnetic, and mechanical properties of Fe<sub>2</sub>CoAl<sub>1-x</sub>Si<sub>x</sub> (x = 0, 0.25, 0.5, 0.75, and 1.0) full heusler alloys: First principles calculations and Monte Carlo simulation*. Materials Today Communications, 2023. p. 107396.
54. Khaled Aledealat, Bilal Al-Aderah, **Abdalla Obeidat**, Abdel-Monem M Rawashdeh, *Enhancing the performance of rare-earth free permanent magnets: A computational study of nitrogen and oxygen defects in CoPt, CoFePt<sub>2</sub>, and CoNiPt<sub>2</sub> alloys*. Journal of Physics and Chemistry of Solids, 2023. p. 111649.
53. **Abdalla Obeidat**, Bilal Aladerah, Maen Gharaibeh, Khaled Aledealat, *Magnetism and magnetic properties of 3d transition metal monolayer on Pd (1 0 0)*, Journal of Magnetism and Magnetic Materials, 2023. p. 171116.
52. Bilal Aladerah, Maen Gharaibeh, **Abdalla Obeidat**, Khaled Aledealat, *A comparative study of structural, electronic, magnetic, and pressure-dependent properties of Full-Heusler Fe<sub>2</sub>XSi (X=Mn and Co): first-principles calculation and Monte Carlo Simulation*, Physica Scripta, 2023. p. 085954.
51. B Aladerah and **A Obeidat**, *Computational Investigation of the Fe<sub>2</sub>XAs (X=Mn and Co) Full Heusler Alloy: Structural, Electronic, and Magnetic Properties*, Results in Physics, 2023. p. 106741.
50. K Aledealat, B Aladerah, **A Obeidat**, *Study of structural, electronic, and magnetic properties of L10-ordered CoPt and NiPt: An ab initio calculations and Monte Carlo simulation* Solid State Communications, 2023. p. 115112.
49. Maen Gharaibeh, Rama Abu Haifa, **Abdalla Obeidat**, *Crystalline field effects on magnetic and thermodynamic properties of a ferrimagnetic-centered rectangular structure*. Indian Journal of Physics, 2023. p. 1997-2005.
48. **Abdalla Obeidat**, Samah Alqaiem, Ahmad Al-Qawasmeh, Mohammad Badarneh, Mohammad-Khair Qaseer, *Magnetic properties of copper fluorides (Cu<sub>2</sub>F<sub>5</sub> inverse spinel-like structure): A Monte Carlo study* Physica B: Condensed Matter, 2023. p. 414698.
47. Abdullah Al-Sharif, Bilal AlAderah, **Abdalla Obeidat**, Jamal Talla, *Influence of transition metal defects on electronic and magnetic properties of bulk silicon: Ab-initio simulation*. Materials Today Communications, 2023. p. 105415.
46. Khaled Aledealat, Bilal Al-Aderah, **Abdalla Obeidat**, Mohammad-Khair Qaseer, Abdel-Monem M Rawashdeh, *Structural, electronic, and magnetic properties of X<sub>3</sub>Pt and XPt<sub>3</sub> (X= Fe, Co, or Ni) alloys: Density functional theory and Monte Carlo simulation*. Physica B: Condensed Matter, 2023. p. 414615.

45. **Abdalla Obeidat**, Bilal Al-Aderah, Mohammad-Khair Qaseer, *Influence of oxygen and nitrogen doping on the structure and magnetic properties of CoNi alloy: First principle calculations*. Journal of Physics and Chemistry of Solids, 2023. p. 111082.
44. **Abdalla Obeidat**, Bilal Aladerah, Mohammad-Khair Qaseer, *Influence of oxygen and nitrogen doping on the structure and magnetic properties of FePt alloy: First principles calculations*. Computational Materials Science, 2023. p. 111963.
43. Khaled Aledealat, Bilal Aladerah, **Abdalla Obeidat**, *Magnetic Properties of Transition-Metal Atomic Monolayer in Nickel Supercell: Density Functional Theory and Monte Carlo Simulation*. Journal of Magnetism and Magnetic Materials, 2022. p. 170173.
42. Ahmad Al-Qawasmeh, Mohammad HA Badarneh, **Abdalla Obeidat**, Sufian Abedrabbo, *Surface roughness effects on magnetic properties of thin films: A computational Monte Carlo study*. Journal of Magnetism and Magnetic Materials, 2022. p. 169734.
41. Ahmad Al-Qawasmeh, Mohammad HA Badarneh, **Abdalla Obeidat**, *Effects of structural disorder on the critical and hysteresis behaviours of nanoparticles with cubic structure*. Chemical Physics Letters, 2022. p. 139866.
40. Maen Gharaibeh, Ali Almahmoud, **Abdalla Obeidat**, *Compensation and transition order temperature behavior of mixed spin-1 and spin-1/2 Ising model on a centered honeycomb-hexagonal structure: two points of compensation*. SN Applied Sciences, 2022. p. 1-9.
39. Khetam Khasawinah, Zain Alzoubi, **Abdalla Obeidat**, *Free-energy differences of OPC-water and SPC/HW-heavy-water models using the Bennett acceptance ratio*. Heliyon, 2022. p. e10000.
38. Ahmad Al-Qawasmeh, Mohammad Badarneh, **Abdalla Obeidat**, Maen Gharaibeh, *Magnetic properties and phase diagrams of Ising mixed spin (1-1/2-1) Multilayer's system with hexagonal structure: A Monte Carlo study*. Physica B: Condensed Matter, 2022. p. 414170.
37. **Abdalla Obeidat**, Bilal Aladerah, Mohammad-Khair Qaseer, *Computational Study of Magnetic Properties of L10 ordered FeNi and FePt binary alloys*. Journal of Magnetism and Magnetic Materials, 2022. p. 169501.
36. **A. Obeidat**, A. Al-Qawasmeh, A. Shukri, *Structural and Electrolyte Properties of Li18P6N16: A First-Principles Computational Study*. J. Electrochem. Soc., 2022, 169 050521
35. Maen Gharaibeh, Ahmad Al-Qawasmeh, **Abdalla Obeidat**, Sufian 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, 2022: p. 413648.
34. Maen Gharaibeh, Mohammad HA Badarneh, Samah Alqaiem, **Abdalla Obeidat**, *Mohammad-Khair 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, 2021. 540: p. 168458.
33. Maen Gharaibeh, Samah Alqaiem, **Abdalla Obeidat**, Ahmad Al-Qawasmeh, Sufian Abedrabbo, Mohammad HA Badarneh, *Magnetic properties of the ferrimagnetic triangular nanotube with coreshell structure: A Monte Carlo study*. Physica A: Statistical Mechanics and its Applications, 2021. 584: p. 126394.
32. 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, 2021: p. e08639.
31. **A. Obeidat** and N. Daoud, *The Magnetic Properties of a Centered Rectangular Lattice with Mixed Spins Using XY Model*. Journal of Superconductivity and Novel Magnetism, 2020. 33(2): p. 545-552.
30. M Gharaibeh, **A. Obeidat**, MK 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. 550: p. 124147.
29. A Al-Qawasmeh, **A. Obeidat**, AA Shukri, NAW Holzwarth, *Computational Investigation of the Electrolyte Properties of Li12P3N9 and Its High Pressure Polymorph Li4PN3 through First-Principles Simulations*. Journal of The Electrochemical Society, 2020. 167(6): p. 060505.
28. **A.A. Obeidat**, M.K. Hassan, and M.H. Badarneh, *Magnetic properties and critical and compensation temperatures in mixed spin-1/2/spin-1 ferrimagnetic-centered rectangular structure using Monte Carlo simulation*. IEEE Transactions on Magnetics, 2019. 55(9): p. 1-5.
27. **A. Obeidat** and M. Badarneh, *New estimations of vapor density and surface tension of water at low temperatures using scaled model*. Journal of Molecular Liquids, 2019. 287: p. 110952.
26. **A. Obeidat** and M. Badarneh, *Critical temperature, surface tension and vapor density estimations of methanol using the scaled model*. Heliyon, 2019. 5(5): p. e01595.

25. **A. Obeidat**, *Free energy of formation of SPC/E-water and TIP4P-water using BAR and TI in MD and MC*. Journal of Molecular Liquids, 2019. 291: p. 111274.
24. K Khasawneh, **A. Obeidat**, H Abu-Ghazleh, R Al-Salman, M Al-Ali, *Evaluation test of the most popular models of methanol using selected thermodynamic, dynamic and structural properties*. Journal of Molecular Liquids, 2019. 296: p. 111914.
23. KA Khasawneh, MM Al-Ali, RM Al-Salman, HA Abu-Ghazleh, **AA Obeidat**, *Jordan Journal of Physics*. Jordan Journal of Physics, 2019. 12(3): p. 201-207.
22. Khaled Aledealat, **Abdalla Obeidat**, Maen Gharaibeh, Adnan Jaradat, Khitam Khasawinah, Mohammad-Khair Hasan, Akram Rousan, *Dynamics of Duffing-Holmes oscillator with fractional order nonlinearity*. The European Physical Journal B, 2019. 92(10): p. 1-6.
21. M Gharaibeh, A Obeidat, W Al Awawdeh, A Rousan , *Effect of Particle Size Distribution on the Magnetization of Ferrofluid* Exp. Theo. NANOTECHNOLOGY (2019), 3, 1-11
20. K Aledealat, K Khasawinah, **A. Obeidat**, M Gharaibeh, A Jaradat, MK Hasan, AA 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 (9), 095102 (2018).
19. **A. Obeidat**, R Al-Salman, H Abu-Ghazleh, *The validity of the potential model in predicting the structural, dynamical, thermodynamic properties of the unary and binary mixture of water-alcohol: Ethanol-water case* AIP Advances 8, 075321 (2018).
18. **A. Obeidat**, H Abu-Ghazleh , *The validity of the potential model in predicting the structural, dynamical, thermodynamic properties of the unary and binary mixture of water-alcohol: Methanol-water case* AIP Advances 8, 065203 (2018).
17. AK Jaradat, **AA Obeidat**, MA Gharaibeh, MKH Qaseer , *Adomian Decomposition approach to solve the simple harmonic quantum oscillator* International Journal of Applied Engineering Research, 13 (2) (2018).
16. **A. Obeidat**, A Jaradat, B Hamdan, H Abu-Ghazleh , *Effect of cutoff radius, long range interaction and temperature controller on thermodynamic properties of fluids: Methanol as an example* Accepted: Physica A 10.1016/j.physa.2018.01.001 (2018).
15. **A Obeidat**, A Jaradat, R Almomani, MK Qaseer, *Solving Inhomogeneous Nonlinear Differential Equations in Terms of Orthogonal Functions Using the Adomian Decomposition Functions*. Applied Mathematical Sciences 11 (34), 1673-1686 (2017)
14. Khaled Aledealat, **Abdalla Obeidat**, Maen Gharaibeh, Adnan Jaradat, Khitam Khasawinah, Mohammad Qaseer, Akram 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 (1) 205-212(2017).
13. A Jaradat, **A Obeidat**, M Gharaibeh, K Aledealat, K Khasawinah, M Qaseer, AA Rousan, *Simple Harmonic Oscillator with Fractional Electric Potential* Revista mexicana de fsica 63 (1), 1-5 (2017).
12. **A Obeidat**, F Hrahshah, G Wilemski, *Scattering Form Factors for Russian Doll Aerosol Droplet Models* The Journal of Physical Chemistry B 119 (29), 9304-9311
11. H Pathak, **A Obeidat**, G Wilemski, B Wyslouzil, *The structure of D2O-nonane nanodroplets* The Journal of Chemical Physics, 140, 22413 (2014).
10. MH Al-Towaiq, **A Obeidat**, AM Al-Momani, *Clustered Diagonally Explicit Runge-Kutta Method for the Solution of Systems of Differential Equations*. published online: Parallel and Cloud Computing vol 2, Iss. 3 (2013).
9. **AA Obeidat**, MA Gharaibeh, DH Al Samarh, MH Qaseer, NY Ayoub, *Effect of Magneto static Dipoles Interaction on the Initial Susceptibility of Dilute Ferrofluids in One Dimension*. Journal of superconductivity and novel magnetism 24 (6), 1911-1916 (2011).
8. **A Obeidat**, M Gharaibeh, M Al-Ali, A Rousan, *Evolution of a Current in a Resistor*. Fractional Calculus and Applied Analysis (2011), No 3, vol 12, 247-259
7. MA Gharaibeh, **AA Obeidat**, DH Al-Samarh, MK Qaseer, NY Ayoub, *Effect of Magnetic Anisotropy on a One Dimensional System of Magnetic particles*. Jordan Journal of Physics, No 3 (1), 17-24, (2010)
6. **A Obeidat**, M Gharaibeh, H Ghanem, F Hrahshah, N AlZoubi, G Wilemski, *Nucleation Rates of Methanol Using the SAFT-0 Equation of State*. A European Journal of Chemical Physics and Physical Chemistry, ChemPhysChem, 11, 3987-3995, (2010)

5. IM Arafa, MM Fares, **A Obeidat**, H El-Ghanem, *Two-dimensional Texture of Intrinsic Conductive Poly (Styrene-co-Maleanilic acid) Grafted with Polyaniline: Formations and Conductivity*. International Journal of Polymeric Materials 60 (9), 620-640 (2010)
4. **AA Obeidat**, MA Gharaibeh, W Al-Sharao, DH Al Samarh, MH Qaseer, NY Ayoub, *Effect of Magnetic Anisotropy on Two Dimensional Dimer Model in Ferrofluids*. International Journal of Nanoelectronics and Materials, 4, 27-35 (2011)
3. **AA Obeidat**, MA Gharaibeh, D Al-Safadi, DH Al Samarh, MKH Qaseer, NY Ayoub, *Anisotropic and Particle-Particle Interaction Effect in a One-Dimensional System of Magnetic Particles*. Journal of Superconductivity and Novel Magnetism, 805-809 (2009)
2. **A Obeidat**, G Wilemski, *Gradient Theory of Nucleation in Polar fluids*. Atmospheric research 82 (3-4), 481-488 (2006)
1. **A Obeidat**, JS Li, G Wilemski, *Nucleation Rates of Water and Heavy Water using Equation of State*. Journal of Chemical Physics, 121, 9510 (2004)

#### Proceedings

5. *Form Factors for Russian Doll Droplet Models*. Nucleation & Atmospheric Aerosols, Fort Collins, Colorado, 2013
4. *The structure of aqueous-alkane nanodroplets*. Nucleation & Atmospheric Aerosols, Fort Collins, Colorado, 2013
3. *Free Energy of Formation of Small Clusters Using the BAR Method and MD Simulations*. Nucleation & Atmospheric Aerosols, Fort Collins, Colorado, 2013
2. *Nucleation of Polar Fluids from Gradient Theory*. Nucleation and Atmospheric Aerosols, Kyoto-Japan, 2004
1. *Binary Nucleation of Nonideal System from Classical and Density Functional Theories*. Nucleation and Atmospheric Aerosols, Kyoto-Japan, 2004

#### Submitted and Accepted Articles

3. *Influence of Structural Modifications on Mechanical and Magnetic Properties of Co<sub>2</sub>FeGa Full Heusler Alloys: A Comparative Study on L2<sub>1</sub> and XA Structures*. Initial Acceptance in Physica B: Condensed Matter
2. *Computational Investigations of the Thermodynamics, Structure, and Dynamics of Binary 1-Propanol /Water Systems at Temperatures Ranging from 245K to 298K*. Initial Acceptance in Journal of Chemical & Engineering Data
1. *A Computational Exploration of the Electronic, Mechanical, and Magnetic Properties of Co<sub>2</sub>Al<sub>1-x</sub>B<sub>x</sub>Al Full Heusler Alloys (A, B = Cr, Mn, and Fe)*". Initial Acceptance in Materials Today Communications

#### On Going Publications

8. *Influence of substitutional defects on the Structural and Magnetic Properties of Barium Hexaferrites*.
7. *Form factor for a Russian Doll Droplet Model*.
6. *Effect of Third Body (Dynamic) Screening on Electron Dipole Scattering in Semiconductors*.
5. *Numerical Simulation of the Rule of Nano-Sized Pinning Centers and Temperature on the Critical Current in High-Temperature Superconductors*.
4. *Binary Nucleation of Water-Ethanol System using Classical Nucleation Theory with SAFT Equation of State*.
3. *A Fractional LC-RC, revisited*.
2. *Domain Wall Motion of Ferrofluid using Fractional Calculus*.
1. *The Intermediate Electric Potential as the Charges Evolve Inversely from Semi-Infinite Line to a Point Charge*.

#### Honors and activities

- |  |      |
|--|------|
| - Scholarship from Ministry of Education, Jordan | 1988 |
| - Graduated 1 <sup>st</sup> rank in class at YU  | 1995 |
| - Sigma Pi Sigma                                 | 1999 |

- Scholarship for young scientists from developing countries, Switzerland 2000
- American Physical Society 2000-present
- Shears price from Rolla university, Physics department, USA 2002

### Computer skills

<i>Software</i>	Languages: C++, Python, Julia, Go, FORTRAN, Pascal, Matlab, LabVIEW, and Assembly Operating Systems: Windows 7, Unix Solaris, Linux Homepages: Front page 3, dream weaver, web studio, Java script, Share point, and PHP Others: Organization, Data-structures in C++, Algorithms in C++, Numerical analysis in C++ Unix operating system in C, and SQL
<i>Hardware</i>	Assembling computers, fixing computers (PCs and Laptops)
<i>Network</i>	Building High Performance Computing (HPC) Lab, Configure servers and installing Linux applications on clusters and servers.

### References

<b>Prof. Dr. Gerald Wilemski</b>	1315 N. Pine Street, Rolla, MO 65409-06403, USA	(573) 341-4409	wilemski@mst.edu
<b>Prof. Dr. Nabil Ayoub</b>	German Jordan University	(962) 799333327	nabil.ayoub@gnu.edu.jo
<b>Prof. Dr. Mohammad Al-Qaseer</b>	Jordan University of Science and Technology	(962) 778629424	qaseer@just.edu.jo