Hazem S. Abusara

CONTACT INFORMATION

Department of Physics
Birzeit University
Birzeit, Palestine

Phone: +(970)
E-mail: habusara@birzeit.edu
WWW:

Home address: Kofr Aqab, East Jerusalem
Date of Birth: July 4^{th} 1984

RESEARCH INTERESTS

Theoretical Nuclear Structure/ Computational Physics

EDUCATION

Mississippi State University, Mississippi State, Mississippi USA

Ph.D. , Applied Physics, December 15^{th} 2011

- Dissertation Topic: "Nuclear Phenomena in Covariant Density Functional Theory"
- Advisor: Anatoli V. Afanasjev

M.S., Physics, December 2008

Birzeit University, Birzeit, Palestine

B.S., Major: Physics/ Minor: Mathematics, July, 2005

POSITIONS

1. Professor, Birzeit University, Sep 1^{st} 2024-present
2. Registrar and Director of Admission, Birzeit University, Aug. 1^{st} 2021-present
3. Head of Physics Department, Birzeit University, Aug 17^{th} 2020-July 31^{st} 2021
4. Director of Master Program in Physics, Birzeit University, Aug 17^{th} 2020-July 31^{st} 2021
5. Associate Professor, Birzeit University, Sep 1^{st} 2018-Aug 31^{st} 2024
6. Assistant Professor, Birzeit University, Aug 26^{th} 2015-Aug 31^{st} 2018
7. Assistant Professor, An-Najah National University, Aug 26^{th} 2012-May 2016
8. Assistant Professor, Palestine Polytechnic University, Jan 22^{nd} 2012- June 15^{th} 2012

HONORS AND AWARDS

Travel Assistance Grant for Graduate Students, office of graduate school, Mississippi State University, in the amount of 1,200$, Oct 2010.

President of the Physics Graduate Student Association at Mississippi State University.

Research/Teaching Assistantship, Department of Physics and Astronomy, Mississippi State University, MS, USA, Jan 2007-Dec 2011.

Elected Associate Member of Sigma Xi Research Society.

Elected student member to the faculty of science council, Birzeit University, 2004-2005

Musa Naser Scholarship, Department of Physics, Birzeit University, Birzeit, WestBank, 2003-2005.

COMMITTEES AT BIRZEIT UNIVERSITY

1. Academic Council (2020-present)
2. Master of Physics Program Committee (2015-2022).
3. Faculty of Science council (2017-2018,2018-2019).

Journal Referee

1. Reports on Progress in Physics
2. Physical Review C
3. Physical Review Letter
4. Journal of Physics G: Nuclear and Particle Physics
5. European Physical Journal A
6. Physica Scripta
7. Ukrainian Journal of Physics

Publications in Peer Reviewed Journals

1. Hanan Qasim and H. Abusara, The role of the single-particle state in the topology of the potential energy surface of ^{72}Kr, International Journal of Modern Physics E, 2450064
2. Nihad Abuawwad, Manuel dos Santos Dias, Hazem Abusara, Samir Lounis, Electrical engineering of topological magnetism in two-dimensional heterobilayers, npj Spintronics 2 (1), 10 (2024)
3. H. Abusara and Mahmoud I. Alstaty, Systematic investigation of proxy-SU(3) model in light nuclei, International Journal of Modern Physics E 32 (12), 2350071(Impact factor 1.1)
4. Hanaa Bashir, H. Abusara and Shajeb Ahmad, Shape Evolution of Nuclei in the Region of (A $\approx$ 30) Using Covariant Density Functional Theory, International Journal of Modern Physics E 32 (08), 2350046 (Impact factor 1.1)
5. Nihad Abuawwad, Manuel dos Santos Dias, Hazem Abusara, Samir Lounis, $CrTe_2$ as a two-dimensional material for topological magnetism in complex heterobilayers , Phys. Rev. B **108** (9), 094409 (2023) (Impact factor 3.908)
6. Nihad Abuawwad, Manuel dos Santos Dias, Hazem Abusara, Samir Lounis, Noncollinear magnetism in a monolayer of 2D $CrTe_2$. Journal of Physics: Condens. Matter **34** 454001, 2022 (Impact factor 2.7)
7. Mahmoud I. Alstaty and H.Abusara, Ground state deformation comparison between covariant density functional theory and proxy-SU(3) model in transitional nuclei, Nuclear Physics A, 1027,122504 (2022) (Impact factor 1.683)
8. Tabassum Naz, Shakeb Ahmad and H. Abusara, Shape isomerism and magicity in Ni isotopes, Modern Physics Letters A 36(18) 2150128, (2021) (Impact factor 2.57)
9. Nihad J. AbuAwwad, H. Abusara, and Shakeb Ahmad, Ground state properties of Zn, Ge, and Se isotopic chains in covariant density functional theory, Phys. Rev. C **101** (6), 064322 (2020) (Impact factor 3.82)
10. Tabassum Naza, M. Bhuyan, Shakeb Ahmad, S. K. Patra, and H.Abusara, Correlation among the nuclear structure and effective symmetry energy of finite nuclei, Nuclear Physics A 987, 295-320, (2019) (Impact factor 1.992)
11. Tabassum Naz, Shakeb Ahmad and H. Abusara, Triple-shape and Superdeformation in Pb isotopes, Acta Physica Polonica B 49(9), P 1653-1681 (2018) (Impact factor 0.998)
12. A. V. Afanasjev, H. Abusara, From cluster structures to nuclear molecules: the role of single-particle degrees of freedom, Phys. Rev. C **97** (2), 024329 (2018) (Impact factor 3.82)
13. A. V. Afanasjev, H. Abusara and S. E. Abgemava, Octupole deformation in neutron-rich actinides and superheavy nuclei and the role of nodal structure of single-particle wavefunctions in extremely deformed structures of light nuclei, Phys. Scr. 93 (2018) 034002 (7pp)(Impact factor 1.28)
14. Tabassum Naz, Shakeb Ahmad and H. Abusara, Triplet states in Lead isotopes, Proceedings of the DAE Symp. on Nucl. Phys. 62 (2017)

15. Shakeb Ahmad, H. Abusara and S. Othman, Triaxiality softness and shape coexistence in Mo and Ru isotopes, Proceedings of the DAE Symp. on Nucl. Phys. 62 (2017)
16. H. Abusara and Shakeb Ahmad, Shape evolution in Kr, Zr, and Sr isotopic chains in covariant density functional theory, Phys. Rev. C **96** (6), 064303 (2017) (Impact factor 3.82)
17. K. Nomura, R. Rodríguez-Guzmán, Y. M. Humadi, L. M. Robledo, and H. Abusara, Structure of krypton isotopes within the interacting boson model derived from the Gogny energy density functional, Phys. Rev. C **96** (3), 034310 (2017)(Impact factor 3.82)
18. H. Abusara, Fission barrier of actinides and superheavy nuclei: Effect of pairing interaction, Journal of Physics: Conference Series, 869, (1),012051,2017 (Proceeding of Frontiers in Theoretical and Applied Physics UAE 2017 (FTAPS 2017))
19. H. Abusara, Shakeb Ahmad, Search of islands of stability for hypothetical superheavey nuclei using covariant density functional theory, Turk. J. Phys. 41, (2017), 203-216 (Impact factor 0.40)
20. H. Abusara, Shakeb Ahmad and S. Othman, Triaxiality softness and shape coexistence in Mo and Ru isotopes, Phys. Rev. C **95** (5), 054302 (2017)(Impact factor 3.82)
21. A. V. Afansjev, H. Abusara, and P. Ring, Nuclear fission in covariant density functional theory, EPJ Web of Conferences, Volume 62, 03003, 2013 (Impact factor 1.56)
22. J.B. Snyder, W. Reviol, D.G. Sarantites, A.V. Afanasjev, R.V.F. Janssens, H. Abusara, M.P. Carpenter, X. Chen, C.J Chiara , J.P. Greene, T. Lauritsen, E.A. McCutchan , D. Seweryniak, S. Zhu,High-spin transition quadrupole moments in neutron-rich Mo and Ru nuclei: testing γ softness. Physics Letters B **723** (2013) 61-65 (Impact factor 6.019)
23. A. V. Afanasjev, H. Abusara and P. Ring, Recent Progress In The Study Of Fission Barriers In Covariant Density Functional Theory, Int. Jour. of Mod. Phys. E volume 21(5) pp 1250025 , May 2012. (Impact factor 0.842)
24. H. Abusara, A. V. Afanasjev and P. Ring, Fission barriers in covariant density functional theory: extrapolation to superheavy nuclei, Phys. Rev. C **85**, 024314 (2012). (Impact factor 3.82)
25. P. Ring, H. Abusara, A. V. Afanasjev, G.A. Lalazissis, T. Niksic and D. Vretenar, Modern applications of covariant density functional theory, Int. Jour. of Mod. Phys. E volume 20(2) pp235-243, 2011. (Impact factor 0.842)
26. A.V. Afanasjev, H. Abusara, E. Litvinova and P. Ring, Spectroscopy of the heaviest nuclei, Journal of Physics: Conference Series, 312 092004, (2011).
27. H. Abusara, A. V. Afanasjev and P. Ring, Fission barriers in actinides in covariant density functional theory: role of triaxiality, Phys. Rev. C **82**, 044303 (2010). (Impact factor 3.82)
28. A.V. Afanasjev and H. Abusara, Time-odd mean fields in covariant density functional theory: Rotating systems, Phys. Rev. **C82**, 034329 (2010). (Impact factor 3.82)
29. A.V. Afanasjev and H. Abusara, Time-odd mean fields in covariant density functional theory: Nonrotating systems, Phys. Rev. **C81**, 014309 (2010). (Impact factor 3.82)
30. A. V. Afansjev, H. Abusara, Covariant density functionals theory: Time-odd channel investigated, AIP Conf. Proc.-Aug 2009- Volume 1165, pp. 283-286, Nuclear Structure And Dynamics 09: Proceedings of the International Conference
31. Q.A.Ijaz, W. C. Ma, H. Abusara, A. V. Afanasjev, Y. B. Xu, R. B. Yadav, Y. C Zhang, M. P. Carpenter, R. V. F. Janssens, T. L. Khoo, T. Lauristen, and D. T. Nisius, Excited superdeformed bands in 154Dy and cranked relativistic mean field Phys. Rev. C **80**, 034322 (2009). (Impact factor 3.82)
32. H. Abusara and A. V. Afanasjev, Hyperdeformation in the Cd isotopes: A microscopic analysis, Phys. Rev. C **79**, 024317 (2009). (Impact factor 3.82)

33. A.V. Afanasjev and H. Abusara, Hyperdeformation in the cranked relativistic mean field theory: the Z= 40-58 region of the nuclear chart, Phys. Rev. **C78**, 014315 (2008).(Impact factor 3.82)

Conference Presentations

1. Sixth Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-VI, Khadouri, Palestine, July 31^{st}-Aug 2^{nd} 2018, Invited Talk: Search of magic numbers beyond the island of stability using covariant density functional theory.
2. First Palestinian International Conference on Peaceful use of Atomic Energy, Palestine technical University - Kadoorie, Feb19-20 2017.
3. Frontiers in Theoretical and Applied Physics UAE 2017 conference, the American University of Sharjah from Feb.22- Feb.25, 2017.
4. Fifth Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-V, Jenin, Palestine, July 31^{st}-Aug 2^{nd} 2016, Invited Talk: Search of magic numbers beyond the island of stability using covariant density functional theory.
5. Workshop in computational methods in science and engineering, An-Najah National University, Nablus Palestine, March 14^{th} 2015, Nuclear Structure: Where do we stand.
6. Fourth Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-IV, Abu-Dies, Palestine, 11-13 August 2014, Time-odd mean field in covariant density functional theory
7. Third Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-III, Hebron, Palestine, 16-18 July 2012, Fission Barriers from Actinides to Superheavies
8. American Physical Society, Nuclear Physics Division, East Lansing, MI, USA, Oct 26th-29th 2011, Exploring the fission barrier of superheavy nuclei in covariant density functional theory.
9. American Physical Society, Nuclear Physics Division, Santa Fe, NM, USA, Nov 2nd-6th 2010, The effect of gamma deformation on the height of the fission barriers in actinides.
10. 8th International Conference on Radioactive Nuclear beam, Grand Rapids, MI, USA, May 26-30 2009, Hyperdeformation at high spin: general features and the best candidate for observations. (Poster Presentation).
11. 8th International Conference on Radioactive Nuclear beam, Grand Rapids, MI, USA, May 26-30 2009, Time-odd mean fields and their impact on physical observables. (Poster Presentation).
12. Mississippi State University, Department of Physics and Astronomy, MS, USA, Mar 25th 2009, Hyperdeformation: motivation, properties and prediction.
13. American Physical Society, Nuclear Physics Division, Oakland, Ca, USA, Oct 23-25 2008, Recent Advances in the study of Hyperdeformation.

Conference organizing

1. Member of the organizing committee, fifth Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-V, Jenin, Palestine, July 31^{st}-Aug 2^{nd} 2016
2. Member of the organizing committee, fourth Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-IV, Jerusalem, Palestine, 11-13 Aug. 2014
3. Member of the organizing committee, National Research day on theoretical and experimental physics, An-Najah National University
4. Member of the scientific committee, third Palestinian Conference on Modern Trends in Mathematics and Physics, PCMTMP-III, Hebron, Palestine, 16-18 July 2012

Undergraduate students seminar supervision

1. Niveen Abu Tair (Spring 2016), Seminar title: Single particle states from spherical into deformed shape
2. Mayar Sheabat (Spring 2016), Seminar title: Fission barrier in macroscopic models
3. Wejdan Bieda (Spring 2018), Seminar title: Shape evolution in A $\approx$ 30 nuclei using covariant density functional theory

Ph.D students supervision

1. Nihad AbuAwwad, In collaborations with Prof. Dr. Samir louins, started Spring 2021
2. Wejdan Bieda, In collaboration with Prof. Volker Meden, started Fall 2021

Master students supervision

1. Saja Titi, Thesis Title: Time-odd mean field: density dependence meson exchange force. (Spring 2017)
2. Sami Mukhiemer, Thesis title: Octupole deformation of Sm isotopes. (Fall 2017)
3. Nihad Abuawwad, Thesis title: Shape coexistence in Ge and Se isotopes using covariant density functional theory. (Spring 2018)
4. Sundos Qatu, Thesis title: Structure of the Cd isotopes, shape and single particle states using relativistic mean field theory (Spring 2019)
5. Duaa Dar Taha, Thesis title: Fission barrier in pre-Actinides nuclei using covariant density functional theory. (Spring 2019)
6. Hanna Bashir, Thesis title: Shape Evolution of Nuclei in the Region of (A=30) Using Covariant Density Functional Theory (Fall 2019)
7. Omar Alfarooq, Thesis title: Binary neutron stars : inner and outer Magnetohydrodynamics (Fall 2020)
8. Shrooq Nairoukh, Thesis title: The Physical properties of 59 Red supergiants stars located in our galaxy

Master students examining committee/BZU

1. Waad Awad, Thesis title: The Abundances of light and medium size clusters in low density nuclear matter.
2. Shayma Wahdan, Thesis title: Preparatory studies on the determination of the top-quark mass in single top-quark events with the ATLAS detector at the LHC
3. Rula Baker, Thesis title: The equation of state of low and intermediate density nuclear matter with light and medium clusters up to A = 50
4. Suhad Daraghmeh, Thesis title: Finding the binding energy for a deuteron immersed in a vapor of nucleons using gaussian potential and the variational principle.
5. Maha Zoud, Thesis title: Effects of Magnetic Field and La-for-Ce Substitution in the Ce_x La_{1-x} $NiGa_2$
6. Alaa Gezzawi, Thesis title: Structure and Electric based gas sensing in ZnO Micro-wires.
7. Arwa Azaar, Thesis title: Supercooling and flash freezing in water and ethylene glycol droplets
8. Mohammad Khaled, Thesis title: Investigating conformational and dynamic differences among Ras oncogenic mutants through molecular dynamics simulations and Markov models
9. Mohammad Qahoosh, Thesis title: Ultrafast electron dynamics in a single molecule
10. Sameh Othman, Thesis title: Nanoparticle-Membrane interactions, a systematic study of the electric charge contribution to the wrapping process
11. Mohammad Qahosh, Electron Dynamics in a Single C60 Molecule
12. Tariq Demadi, Properties of Three-Higgs-Doublet Models and Dark Matter Candidates

Master students examining committee/External

1. Mohammed Abu Ridi, Thesis title: A Comparative Study of the Regularization Parameter Estimation Methods for the EEG Inverse Problem, An-Najah National University
2. Musa Mutair, Thesis title: Approximate solutions of Einstein field equations, Al-Quds University
3. Omar Istaitia, Thesis titile: ATLAS Inner Detector Upgrade ITk at the European Organization for Nuclear Research (CERN), An-Najah National University
4. Wafa Haj Mohammad, Rashba And Dresselhaus Spin Orbit Effects on The Magnetization and Susceptibility of InAs- Quantum Wire, An-Najah National University
5. Asad Shendi, Study the magnetocaloric effect in diluted magnetic Manganese doped Cadmium Telluride ($Cd_{1-x}Mn_xTe$) quantum wire, An-Najah National University

Computer Skills

- Programming Languages: C++, Fortran77, MPI parallel processing library.
- Applications: XMGRACE plotting software, LaTeX, and presentation software
- Operating Systems: Unix/Linux, Windows.

Courses Taught

Mississippi State University 2010-2011

1. General Physics I Lab
2. General Physics I (Algebra based)

Palestine Polytechnic University Spring 2012

1. General Physics I (Calculus based)
2. General Physics II (Calculus based)
3. Radiation Protection and Safety

An-Najah National University Fall 2012-Spring 2015

1. General Physics I (Calculus based)
2. General Physics I Lab
3. General Physics II (Calculus based)
4. General Physics II Lab
5. General Physics III
6. Quantum Mechanics I (Undergraduate Students)
7. Quantum Mechanics II (Undergraduate Students)
8. Atomic Physics (Undergraduate Students)
9. Nuclear Physics (Undergraduate Students)
10. Nuclear Physics (Graduate Class, Master students)
11. Special Topics: Quantum Optics (Graduate Class, Master students)
12. Quantum Mechanics I (Graduate Class, Master students)
13. Quantum Mechanics II (Graduate Class, Master students)
14. Advanced Quantum Mechanics (Graduate Class, PhD students)

15. Quantum Field Theory (Graduate Class, PhD students)

Birzeit University Fall 2014, Fall 2015-present

1. General Physics I (Calculus based, General Lecture for 160 student)
2. General Physics I (Calculus based, Discussion)
3. General Physics I Lab
4. General Physics II (Calculus based, General Lecture for 160 student)
5. General Physics II (Calculus based, Discussion)
6. General Physics III (Undergraduate Students)
7. General Physics (For Health and Life Sciences) (Undergraduate Students)
8. Waves and vibrations (Undergraduate Students)
9. Modern Physics (Undergraduate Students)
10. Mathematical Methods (Undergraduate Students)
11. Quantum Mechanics I (Undergraduate Students)
12. Quantum Mechanics II (Undergraduate Students)
13. Computational Physics (Master students, Fall 2014)
14. Electromagnetic Theory I (Master Students)
15. Quantum Mechanics (Master students)
16. Statistical Mechanics (Master students)
17. Nuclear Structure (Master students; developed the course)

References

- Dr. Anatoli V. Afanasjev, Professor, Department of Physics & Astronomy, Mississippi State University.
- Dr. Abdallah sayyed-Ahmad, Professor, Department of physics, Birzeit University.
- Dr. Shakeb Ahmad, Associate Professor, Department of Physics Aligarh Muslim University, Aligrah, India.