

Dr. ZIAD YOUSEF ABU WAAR

د. زياد يوسف أبو وعر

EDUCATION:

I. Ph. D in (Nano Science /Material Science).

University of Arkansas, Fayetteville, AR, USA. May 2007, (GPA: 4.00/4.00).

Dissertation written as partial requirement to Ph.D. degree: “The Underlying Physics in the Formation of self-Assembled (In,Ga)As Nanostructures”

II. Master of Physics, *University of Arkansas*, Fayetteville, AR, USA. December 2003.

III. M. Sc. Solid State Physics, *Yarmouk University*, Irbid, Jordan.

The title of the M. Sc.. thesis is: “Electrical and Optical Properties of Amorphous Zinc Oxide Thin Films” - Link: <http://portal.yu.edu.jo/>

IV. B. Sc. With a major in Physics and a minor in Mathematics , *Yarmouk*

University, Irbid, Jordan. - Link: <http://portal.yu.edu.jo/>

PUBLICATIONS:

1. “Performance Optimization of Double-Absorber Perovskite Solar Cell: Numerical Calculations”, Shadi Yasin, Mohamed Moustafa, Ziad Abu Waar, CPEEE 2024 (2024).
2. “Toward An Understanding Of The HCP Anistropy In Zinc Material:m Total Scattering Structural Study Using Temperature Dependent X-Ray Pair Distribution Functioni Analysis Synchrotron Based”, Ahmad S. Masadeh, Gassem M. Alzoubi, Moneeb T. M. Shatnawi, Osama Abu-Haija, Ziad Abu Waar, and Yang Ren, JJP, 17 (2024).
3. “Real space study of local bonding for zinc structure based on temperature-dependent x-ray pair distribution function analysis”, Ahmad S Masadeh, Moneeb Shatnawi, Ziad Y Abu Waar, Gassem M Alzoubi, Yang Ren, AIP Advances, 12, 095313 (2022).
4. “Towards High-Efficiency CZTSe Solar Cells Through the Optimization of the p-MoSe₂ Interfacial Layer”, Mohamed Moustafa, Tariq AlZoubi, Shadi Yasin, Ziad Abu Waar and Ahmad Moghrabi, Journal of Physics: Conference Series, 012022 (2022).
5. “Optoelectronic simulation of a high efficiency C₂N based solar cell via buffer layer optimization”, S Yasin, Z Abu Waar, T Al Zoubi, M Moustafa, Optical Materials, 119, 111364 (2021).
6. “High efficiency performance of eco-friendly C₂N/FASnI₃ double-absorber solar cell

- probed by numerical analysis”**, S Yasin, Mohamed Moustafa, T Al Zoubi, G Laouini, **Z Abu Waar**, *Optical Materials*, 122, 111743 (2021).
7. **“RHEOLOGICAL AND SENSORY CHARACTERISTICS OF YOGHURT POWDER SOLUTION”**, Mohammed Saleh, **Ziad AbuWaar**, Salah-Eddin Araj, Tawfiq M Al Antary, Muhanad Akash, *Fresenius Environmental Bulletin*, Volume 29 – No. 09A/2020 pages 8480-8486 (2020).
 8. **“Development of high efficiency CZTS solar cell through buffer layer parameters optimization using SCAPS-1D”**, Shadi Yasin a, **Ziad Abu Waar**, Tariq Al Zoubi, *Materials Today: Proceedings*. Volume 33, Part 4, Pages 1825-1829 (2020).
 9. **“COMPARING THE IMPACTS OF FENUGREEK (TRIGONELLA FOENUM-GRACUM) GALACTOMANNAN TO ARABIC GUM, κ-CARRAGEENAN, XANTHAN AND CARBOXYMETHYL CELLULOSE ON WHEAT FLOURS FUNCTIONAL CHARACTERISTICS”**, Mohammed Saleh , **Ziad AbuWaar** , Salah-Eddin Araj , Tawfiq M Al Antary , Youngseung Lee, *Fresenius Environmental Bulletin*, Volume 29 – No. 09A/2020 pages 8472-8479(2020).
 10. **“Under vacuum photoluminescence study of vertically stacked InAs/GaAs quantum dots”**, **Ziad Y. AbuWaar**, *Jordan .J .Phys.* 7, pp.1-6 (2014).
 11. **“Effect of Stabilized Rice Bran Fractions on the Formation of Rice Flour Pasting Properties”**, Mohammed I. Saleh, **Ziad Y. Abu-Waar**, Muhanad W. Akash, and Maher Al-Dabas, *Cereal Chemistry* Vol.91, No.6, PP:603-609 (2014).
 12. **“Viscoelastic and Textural Properties of Cheddar Cheese under Various Temperature Conditions”**, **Ziad Abu-Waar**, Mohammed Saleh and Young S. Lee, *Life Sci J*;10(3):2126-2131(2013).
 13. **"Aharonov-Bohm Interference in Neutral Excitons: Effects of Built-In Electric Fields"**, M. D. Teodoro, ..., **Z. Y. AbuWaar**, G. J. Salamo, *Physical Review Letters* 104, 086401 (2010).
 14. **“Design of nanostructure complexes by droplet epitaxy”**, J. H. Lee, Zh. M. Wang, **Ziad Y. AbuWaar**, and G. J. Salamo, *Crystal Growth & Design* 9, 715-721 (2009).
 15. **“Spectroscopic observation of developing InAs quantum dots on GaAs ringlike -nanostructured templates”**, Yu. I. Mazur, **Z. Y. Abu Waar**, T. D. Mishima, J. H. Lee, G.. Tarasov, B. L. Liang, V. G. Dorogan, , M. E. Ware, Zh. M. Wang, M. B. Johnson, and G.. J. Salamo, *J. Appl. Phys.* 104, 044310 (2008).
 16. **“In situ photoluminescence study of uncapped InAs/GaAs quantum dots”**, **Ziad Y AbuWaar**, E Marega Jr, M Mortazavi and Gregory J Salamo, *Nanotechnology* 19, 335712 (2008).
 17. **“Optical behavior of GaAs/AlGaAs ringlike nanostructures”**, **Ziad Y. AbuWaar**, Yuriy I. Mazur, Jihoon H. Lee, Zhiming M. Wang, and Gregory J. Salamo, *J. Appl.*

- Phys.* **101**,024311 (2007).
18. “Shape transformation during overgrowth of InGaAs/GaAs(001) quantum rings”, M. Hanke, Yu. I. Mazur, E. Marega Jr., Z. Y. AbuWaar, G. J. Salamo, P. SchÄafer, and M. Schmidbauer, *Appl. Phys. Lett.* 91, 043103 (2007).
 19. “Self-assembled InAs quantum dot formation on GaAs ring-like nanostructure templates”, N. W. Strom, Zh. M. Wang, J. H. Lee, Z. Y. AbuWaar, Yu. I. Mazur, and G. J. Salamo, *Nanoscale Res. Lett.*, DOI 10.1007/s11671-007-9040-1, 2:112-117 (2007).
 20. “Observation of Ga droplet formation on (311)A and (511)A GaAs surfaces”, Ziad Y AbuWaar, Zhiming M Wang, Jihoon H Lee and Gregory J Salamo, *Nanotechnology* **17**, 4037–4040 (2006).
 21. “Evolution between self-assembled single and double ring-like nanostructures”, J. H. Lee, Zh. M. Wang, Z. Y. AbuWaar, N. W. Strom and G. J. Salamo, *Nanotechnology* **17**, 3973-3976 (2006).
 22. “Controlling Lateral Ordering of InGaAs Quantum Dots with Arsenic Background”, Euclydes Marega Jr., Ziad Abu Waar, Mohammad Hussein, Gregory Salamo, MRS 0959-M17-16 (2006).

PROCEEDINGS and ATTENDED SCINTIFIC ACTIVITIES:

1. The 10th International Perta School of Physics (PSP10), Quantum Computing: Theory and Applications”, Amman, Irbid, Petra, Jordan October 9-13, 2023.
2. 11th SESAME Users meeting, Amman, Jordan, Nov. 20th – 22th, 2013.
3. “Nanotechnology in Jordan and Priorities Regarding Nanoparticles”, Ziad Y. AbuWaar, Final Workshop for the Industrial Chemicals Project under the Rotterdam Convention in Jordan, Jan. 5th-9th, 2013.
4. 8th Workshop of the Jordanian National Committees for SESAME, May 2012.
5. 9th SESAME Users meeting, Amman, Jordan, Nov. 12th – 14th, 2011.
6. SESAME-JSPS School 2011, Electronic Structure. SESAME, Allan Jordan Nov. 14th – 16th, 2011.
7. “In situ photoluminescence study of uncapped InAs/GaAs quantum rings”, Ziad Y AbuWaar, E Marega Jr, M Mortazavi and Gregory J Salamo, *Nanostructured Advanced Material and Technology*, Amman. Jordan, November 10-13, (2008).
8. “Controlling Lateral Ordering of InGaAs Quantum Dots with Arsenic Background”, Ziad Y. Abu Waar, M. L. Hussein, E. Marega Jr.a) and G. J. Salamo. *Materials Research Society (MRS) Fall meeting* at Boston, Massachusetts, USA (2006).

9. “Self-Organized Single and Double Ring-Like Nanostructures ”, **Ziad Y. Abu Waar**, Zhiming M. Wang, Yuriy I. Mazur, Jihoon H. Lee , Gregory. J. Salamo, *Materials Research Society (MRS) Fall meeting* at Boston, Massachusetts, USA (2006).
10. “Optical Behavior of GaAs/AlGaAs Ring-Like Nanostructures.” **Ziad Y. Abu Waar**, Yuriy I. Mazur, Jihoon H. Lee, Zhiming M. Wang , Gregory. J. Salamo, *National Science Foundation (NSF) Experimental Program to Stimulate Competitive Research (EPSCoR) conference* in Little Rock, USA (2006).
11. “Strain in Uncapped InAs Quantum Dots.” E.Marega, **Ziad Y. Abu Waar** , and Gregory. J. Salamo. **International Conference on Nanoscience and Technology, Basel Switzerland, 30 July- 4 August 2006.**
12. “Photoluminescence Studies of Low Dimensional Systems in Ultra High Vacuum Invironment.” **Ziad Y. Abu Waar**, E. Marega Jr., M. Mortazavi, and Gregory. J. Salamo, *National Science Foundation (NSF) Experimental Program to Stimulate Competitive Research (EPSCoR) conference* in Little Rock, USA (2004).

TEACHING/EMPLOYMENT EXPERIENCE:

I. October 2023 ~ Present

Associate Professor, at Physics Department, The University of Jordan, Amman 11942, Jordan.

II. September 2015 ~ October 2023

Associate Professor, at Physics Department, The University of Jordan, Amman 11942, Jordan.

(Sabbatical and unpaid leave at College of Engineering and Technology, American University of the Middle East, Kuwait.)

III. February 2014 ~ September 2015

Associate Professor, at Physics Department, The University of Jordan, Amman 11942, Jordan.

IV. November 2007 ~ February 2014

Assistant Professor, at Physics Department, The University of Jordan, Amman 11942, Jordan.

V. December 2005~ May 2007:

Research Assistant (in Dr. Salamo’s group) at University of Arkansas, Fayetteville, AR, USA.

<http://www.uark.edu/misc/salamo/>

Graduate Research Assistant:

- Performed experimental research in the area of molecular beam epitaxial (MBE) growth and electrical/optical characterization of III-V based semiconductor Nano structures.
- Designed a system allowing photoluminescence measurements inside a scanning tunneling microscope chamber at ultra high vacuum.

- Studied the surface science, strain, and stress relaxation rule in forming III-V based semiconductor nano structures.
- Studied the optical and structural properties of uncapped non-oxidized and oxidized InAs quantum dots on GaAs substrate as a function of the thickness of a GaAs capping layer.
- Fabricated self-organized InAs quantum rings (Q.Rs) on GaAs substrate. Studied the optical and structural properties of the Q.Rs. Studied the influence of strain field and InAs segregation on the surface morphology, optical properties and vertical ordering of two Q.R layers for GaAs spacers between layers from 3 to 10 nm.
- Used the droplet epitaxy technique to fabricate lattice matched nanometer-scale GaAs single and double quantum rings on AlGaAs layer. Studied the structural and optical properties of the fabricated Q.Rs.
- Assisted in the maintenance of Riber 32P molecular beam epitaxy systems, Omicron scanning tunneling microscopes, and related ultra-high vacuum systems.

VI. August 2001 ~ December 2005:

Teaching Assistant, at Physics Department, University of Arkansas, Fayetteville, AR, USA.
(Freshman labs, Mechanics, Waves, Sound, Electricity and Magnetism)

VII. January 1998 - July 2001:

Teaching Assistant (Full time), at the Department of Physical Sciences, Jordan University of Science and Technology, Irbid, Jordan. **I taught the following labs:**

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| -Freshman labs | -Modern Physics |
| -Electronics I and Electronics II | -Optics |
| -Properties of matter and Heats | -Nuclear Techniques I & Nuclear Techniques II |

EQUIPMENT EXPERIENCE:

Resourceful Ph.D. semiconductor nanostructure scientist with experience in:

- Molecular beam epitaxy (MBE) of III-V semiconductor materials.
- Surface science, Strain, Stress Relaxation.
- Growth and annealing of III-V based quantum dot systems.
- Design and growth of multi-color quantum well infrared detectors
- Silicon processing techniques including diffusion doping, thermal oxidation, photolithography, and wet etching.
- Vacuum systems including ultra-high vacuum (UHV) systems involving ion pumps, turbo pumps, cryogenic pumps, and titanium sublimation pumps.

- Material characterization techniques including scanning tunneling microscopy (STM), scanning electron microscopy (SEM), atomic force microscopy (AFM), reflection high energy electron diffraction (RHEED), photoluminescence (PL).

MEMBERSHIPS, COMMITTEES, AND TALKS:

1. Member of the National Committee for Nanotechnology in Jordan.
2. Member of the National Profile for the Management of Chemicals Updating Team (Fourth Edition).
3. Member of the American Physical Society (APS).
4. American Chemical Society (ACS).
5. Materials Research Society (MRS).
6. Refereeing physics papers for international journals.
7. Public Talk on: " Nanotechnology in Jordan and Priorities Regarding Nano-particles Management in Jordan ".
8. The scientific research committee at the department of physics.
9. The committee responsible for equipping the physics teaching laboratories.
10. Member of the appointment committee at the department of physics.
11. Member of the comprehensive master exam committee at the department of physics for several times.