Muatez Mohammed, Ph.D.
Curriculum Vitae

Education

- **Ph.D. in Applied Sciences (Applied Physics)**, University of Arkansas at Little Rock (UALR), January 2009-May 2014, dissertation title: "Research and Development of Carbon Nanostructured Materials Based Solar Cells".

- **M.S. in Applied Sciences**, University of Arkansas at Little Rock (UALR), January 2009-May 2013.

- **M.S. in Physics**, Al-Mustansiriyah University, Baghdad, Iraq, September 2002-August 2005; Thesis title: "Multipole Mixing Ratios of Gamma Ray Transitions, by Constant Statistical Tensor and a2-Ratio Methods, for Some Nuclear Reactions".

- **B.S. in Physics**, Al-Mustansiriyah University, Baghdad, Iraq, October 1993-July 1998.

Teaching/Education Experience

August 2024 - to present.

Instructor of Physics: Department of Chemistry and Physics, Midwestern State University (MSU).

Courses Teaching:
General Physics: College Physics, for a total of 50 undergraduate students.

Mechanics, Wave Motion, & Heat: For a total of 50 undergraduate students.

Electricity, Magnetism and Optics: For a total of 30 undergraduate students.

August 2019 - August 2024

Lecturer: Department of Physics and Astronomy, University of Central Arkansas (UCA).

Courses Taught:
College Physics: Lecturer and Lab Instructor for a total of 48 undergraduate students.

Physical Science: Lecturer and Lab Instructor for a total of 142 undergraduate students.

March 2015 - October 2016

Lecturer: College of Science, Al-Qadisiyah University, Al-Qadisiyah, Iraq.

Courses Taught:
Physics I: Lecturer and Lab Instructor for a total of 110 Biology freshman undergraduate students.

Computer Science I: Lecturer for 112 Chemistry sophomore undergraduate students.

Mentor: Working with 1 Master's student developing silica nanoparticles and silver nanoparticles for use in pesticide research and development.

January 2013 - May 2014

Lab Instructor: Department of Physics and Astronomy, University of Arkansas Little Rock (UALR)

Courses Taught:
College Physics I Lab (2 sections): Instructor for 30 undergraduate students.

May 2011 - May 2015

Student Teaching/Mentorship in Research: Department of Physics and Astronomy, University of Arkansas Little Rock (UALR).

(Dr. Tar-pin Chen's lab): Mentor. Supervised research projects on solar cells, for 4 undergraduate students. Worked with advisor in helping students with homework and tutoring, for 30 undergraduate students.

January 2011 - May 2015

Tutor/Work Study: Department of Physics and Astronomy, University of Arkansas Little Rock (UALR).

Tutoring undergraduate students in Physics for 30 undergraduate students.

September 2005 - April 2008

Lecturer: College of Science, Al-Qadisiyah University, Al-Qadisiyah, Iraq.

Courses Taught:
Introduction of Mathematical Physics: Lecturer for 110 undergraduate students.

March 2002 - October 2002

Assistant Researcher: College of Science, Al-Qadisiyah University, Al-Qadisiyah, Iraq.

Courses Taught:
Physics I Lab: Instructor for 60 undergraduate students.

Teaching Interests

Undergraduate: Introductory Physics, Mechanics, Electromagnetism, Mathematical Physics, Optics, Thermodynamics, Modern Physics, Quantum Mechanics, Classical Mechanics, Material Science, Solid State Physics, and Electronics.

Research Interests

My research is focused on the synthesis of carbon nanotubes, graphene, semiconductor thin films, 3D nanomaterials, and dye synthesized solar cells (DSSC), examining their useful physical properties, and modifying those properties for practical applications in mechanical,

electronic, and optoelectronic devices. I am also interested in other aspects of the nanotechnology field of study for environmental, industrial, biological, and medical applications.

Research Activities

October 2016 - October 2018

Visiting Researcher: Department of Physics and Astronomy, University of Arkansas Little Rock (UALR).

October 2016 - October 2018

Working with Dr. Tar-pin Chen conducting research with Deposition and Characterization Techniques in photovoltaic solar cells.

October 2016-May 2017

Attained Affiliate Graduate Faculty status to Co-advisor for 2 Ph.D. students in research to develop and finish their dissertations. Included in their posters for the Student Research and Creative Works EXPO, University of Arkansas at Little Rock, Little Rock, Arkansas April 03, 2017, where 1 students' poster placed 3rd place. Also, 2 students' manuscripts are published in the Solar Energy journal. The published student has since graduated with a Ph.D.

January 2011- May 2015

Research Assistant: Department of Physics and Astronomy, University of Arkansas Little Rock (UALR).

(Dr. Tar-pin Chen's lab): Assistant Researcher. Synthesized materials; CdS, Cu_2O, ZnO, NiO, Equipment used for Characterization; Photoluminescence Spectroscopy, X-Ray Diffraction, Raman Spectroscopy, and Scanning Electron Microscopy (SEM). Also, helping undergraduate and graduate students with their characterization techniques and processes in various research projects.

March 2010 - May 2014

Doctoral Research: Department of Applied Science, UALR, Advisor: Dr. Tar-Pin Chen, Co- advisor: Dr. Jingbiao Cui.

Current/Previous Research:

- Processing CNTs and Graphene.
- Processing and testing CdS Nanogenerators.
- Processing and testing device applicable CNTs, Graphene, CdS, Cu_2O, TiO_2, ZnO, NiO, AZO.
- Processing and testing Polymers, Pyrrole, Thiophene, PEDOT-PSS, and Aniline.

Technique/Device Experience: Electrodeposition, Sol-gel Processes, Sputtering, Chemical Bath Deposition (CBD), Atomic Layer Deposition (ALD), Chemical Vapor Deposition (CVD), Autoclave, and Oxygen Plasma Etching, Device Characterization. Photoluminescence Spectroscopy (room temperature and low temperature), Hall Effect and Resistivity, UV-Vis Spectroscopy (reflection, transmission, and absorption), X-Ray Diffraction, Raman Spectroscopy, Scanning Electron Microscopy (SEM), Thermogravimetric Analysis (TGA), Atomic Force Microscopy (AFM).

University Service

November 2013

Competition Judge: EAST Initiative Offices, Arkansas Science and Technology Authority, ASSET (Advancing and Supporting Science, Engineering and Technology) Solar Design

Competition with EAST (Environmental And Spatial Technology) Initiative. Judged a Physics competition for high school students from various high schools in Arkansas.

August 2013

Orientation Volunteer: International Student Services, University of Arkansas Little Rock (UALR). Helped international students understand their surroundings, curriculum, and informed them of the different offices for their specific needs during orientation.

Publications

1. S. Tuma, O. Abdulrazzaq, N. Nasir, A. Saloom, **M. Mohammed,** "Enhanced Photovoltaic Performance of Silicon Solar Cells via Plasma-Deposited Antireflective Titanium Dioxide Coatings", Journal of Applied Sciences and Nanotechnology, Vol. 5, No. 4, Dec. 10, 2025

2. O. Abdulrazzaq, S. Atewi, R. Tuama, **M. Mohammed, "**Revealing the Hidden Benefits of Dust for Photovoltaic Performance in Hot Climates", Iraqi Journal of Industrial Research, Vol. 11, No. 2*,* 2024.

3. **M. Mohammed**, S AbdulAmohsin, Z. Li, and L. Zheng, "Enhanced Photovoltaic Conversion of ZnO/PANI/NiO_X Heterostructure Devices with ZnO Nanorod Array" Nano Express, 1, 030016, 2020.

4. T.P. Chen, K. Wu, Q. Li, B. Chen, ZX Wang, JC Chen, **M. Mohammed,** "Transport Studies on Metal (M) Doped $PrBa_2Cu_3O_7$ ", Peking University in China Endless Quests: Theory, Experiments And Applications Of Frontiers Of Superconductivity, Chapter **3**, 155-169, 2019.

5. Book: **Muatez Mohammed**. "Beneficial Novel Nanostructured Carbon Materials for Solar Cells". LAP LAMBERT Academic Publishing (2017-March-7) ISBN-13: 978-3330053182. German

   https://www.researchgate.net/publication/319135626_Beneficial_Novel_Nanostructured_Carbon_Materials_for_Solar_Cells

6. E. Alkuam, **M. Mohammed,** T. P. Chen; "Enhanced synthesis of cadmium sulfide by electrodeposition in dyesensitized solar cells" Solar Energy **157,** 342, 2017.

7. G. Mohammed, **M. Mohammed**, D. Ridha; "The antimicrobial activity of silica oxide nanoparticles against some bacteria fungi isolates", Journal of Global Pharma Technology, ISSN: 0975 -8542, 498, 2017.

8. E. Alkuam, **M. Mohammed**, T. P. Chen; " Fabrication of CdS nanorods and nanoparticles with PANI for (DSSCs) dye-sensitized solar cells", Solar Energy, **150**, 317, 2017.

9. **M. Mohammed**, Z. Li, T. P. Chen; "Layer Characterization and Photovoltaic Properties of CdS/MWNT/n-Si Device with an n-p-n Transistor Structure", Journal of the Renewable and Sustainable Energy, **8**, 1, 013101-9, Jan 2016.

10. S. AbdulAlmohsin, Sabah Mohammed Mlkat al Mutoki, **M. Mohammed**; "ZnO Nanowire/N719 dye/Polythiophene-SWNT nanocomposite solid state dye sensitized solar cells", Automation, Control and Intelligent Systems, **3**, 2-1, 12-17, 2015.

11. **M. Mohammed**, Z. Li, J. B. Cui, T. P. Chen; "Acid-doped Multi-wall Carbon Nanotube/n-Si Heterojunctions For Enhanced Light Harvesting Solar Energy", Solar Energy, **106**, 171, 2014.

12. **M. Mohammed**, A. AL-Hilo, T. P. Chen; "Double Schottky of NiOx/Graphene/Si for Enhance Efficiency Solar Cells," Photovoltaic Specialists Conference (PVSC), 40th IEEE, J. IEEEXplore 2998-3003, 2014.

13. **M. Mohammed**, S. AbdulAlmohsin, Z. Li, T. P. Chen; "ZnO Nanowire/N719 dye/Polypyrrole- SWNT nanocomposite Solid State Dye Sensitized Solar Cells", Photovoltaic Specialists Conference (PVSC), 40th IEEE, J. IEEEXplore 1510-1514, 2014.

14. Al-Hilo, **M. Mohammed**, J. Armstrong, T. P. Chen; "Enhanced Performance Core-cell Si/CdS Nanowires Heterojunction Solar Cell Device", Photovoltaic Specialists Conference (PVSC), 40th IEEE, J. IEEEXplore 2447-2451, 2014.

15. T. P. Chen, K. Wu, Q. Li, B. Chen, Z.X. Wang, J. C. Chen, **M. Mohammed**; "2-D and Mott Transition Studies on Metal (M) Doped PrBa2Cu3O7", Journal of Low Temperature Physics, **173**, 89, 2013.

16. **M. Mohammed**, A. Al-Hilo, Z. Li, S. AbdulAlmohsin, J. Armstrong, T. P. Chen, J. B. Cui; "Cu2O/SWNTs/n-Si Heterojunctions for Enhanced Light Harvesting", Photovoltaic Specialists Conference (PVSC), 39th IEEE, J. IEEEXplore 0599-0604, 2013.

17. Al-Hilo, **M. Mohammed**, J. Armstrong, T. P. Chen, J. B. Cui; "Fabrication and Characterization of Si/ZnO Branched Heterojunction Structures", Photovoltaic Specialists Conference (PVSC), 39th IEEE, J. IEEEXplore, 2628-2632, 2013.

18. S. M AbdulAlmohsin, J. B. Cui, **M. Mohammed**; "Study on ZnO / P3HT: PCBM Nanowire Solar Cells", Photovoltaic Specialists Conference (PVSC), 39th IEEE, J. IEEEXplore, 2685-2689, 2013.

19. **M. Mohammed**, Z. Li, J. Cui, T. P. Chen; "Junction Investigation of Graphene/Silicon Schottky Diodes", Nanoscale Research Letters, 7:302, doi: 10.1186/1556-276X-7-302, 2012.

20. S. AbdulAlmohsin **M. Mohammed**, Z. Li, M. A. Thomas, K. Y. Wu, and J. B. Cui; "Multi-Walled Carbon Nanotubes as a New Counter Electrode for Dye-Sensitized Solar Cells," Journal of Nanoscience and Nanotechnology, **12**, 2374, 2012.

21. S. AbdulAlmohsin, Z. Li, **M. Mohammed**, K. Wu, Jingbiao; "Electrodeposited Polyaniline/Multi- Walled Carbon Nanotube Composites for Solar Cell Applications," Synthetic Metals, **162**, 931, 2012.

22. **M. Mohammed**, Z. Li, J. B. Cui, T. P. Chen; "Electric and Optical Transport of Multi-Walled Carbon Nanotube/Silicon Junctions", Photovoltaic Specialists Conference (PVSC), 38th IEEE, J. IEEEXplore 002315-002320, 2012.

Journal Reviewer and Editor (Peer Review)

- Journal Reviewer and Editor for "The Journal of Applied Sciences and Nanotechnology"
- Journal Reviewer and Editor for "Egyptian Journal of Chemistry"

- Journal Reviewer and Editor for "Iraqi Journal of Industrial Research"
- Member of the Materials Research Society (MRS)
- Member of the Delta Epsilon Iota Academic Honor Society
- Member of the Phi Kappa Phi Honor Society
- Member of the American Physical Society (APS)
- Member of Biophysics Society (BPS).

Conferences Attended

1. Fourth Annual Renewable Energy Conference, Arkansas State University, Jonesboro, Arkansas September 19, 2014.
2. NSF EPSCoR Annual State Conference, Little Rock, Arkansas September 4-5, 2014.
3. 40th IEEE Photovoltaic Specialists Conference (PVSC) in Denver, Colorado June 8-13, 2014.
4. Materials Research Society (MRS) in San Francisco, California April 22-25, 2014.
5. Student Research and Creative Works EXPO, University of Arkansas at Little Rock, Little Rock, Arkansas April 21, 2014.
6. The Arkansas Academy of Science (AAS) 98th Annual Meeting in Harding University, Searcy, Arkansas April 4-5, 2014.
7. 57th Midwest Solid State Conference (MSSC), University of Kansas Campus Lawrence, Kansas September 28-29, 2013.
8. ASSET Initiative Annual Conference, Little Rock, Arkansas June 25-27, 2013.
9. 39th IEEE Photovoltaic Specialists Conference (PVSC) in Tampa, Florida June 16-21, 2013.
10. Student Research and Creative Works EXPO, University of Arkansas at Little Rock, Little Rock, Arkansas April 15, 2013.
11. The Arkansas Academy of Science (AAS) 97th Annual Meeting hosted by Arkansas Tech University, Little Rock, Arkansas April 5-6, 2013.
12. "Science: Becoming the Messenger" Workshop, University of Arkansas at Little Rock, Little Rock, Arkansas September 26, 2012.
13. NSF EPSCoR Annual State Conference, Springdale, Arkansas August 13-14, 2012.
14. 38th IEEE Photovoltaic Specialists Conference (PVSC) in Austin, Texas June 3-8, 2012.

15. Student Research and Creative Works EXPO, University of Arkansas at Little Rock, Little Rock, Arkansas April 16, 2012.

16. The Arkansas Academy of Science (AAS) 96th Annual Meeting, Southern Arkansas University, Magnolia, Arkansas April 13-14, 2012.

Awards and Honors

- **3rd Place, Outstanding Graduating Graduate Research Award** - University of Arkansas at Little Rock (UALR), Department of Physics and Astronomy, College of Arts, Letter, and Sciences, 2017.

- **Outstanding Graduating Graduate Research Award** - University of Arkansas at Little Rock (UALR), Department of Physics and Astronomy, College of Science and Mathematics, 2014.

- **Honorable Mention** - University of Arkansas at Little Rock (UALR), Graduate Division, Engineering and Technology, Research Expo, 2013.

- **Honorable Mention** - University of Arkansas at Little Rock (UALR), Graduate Division, Physical Science, Research Expo, 2012.

- **Outstanding Graduating Graduate Student Poster** - The Arkansas Academy of Science 96th Annual Meeting (AAS), 2012.