

# **Dr. Hussain Alawadhi**

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## **Education**

- Ph.D., Physics (Experimental Condensed Matter), Purdue University (West Lafayette, USA), December 1999.
- M.Sc., Physics, Purdue University (West Lafayette, USA), May 1993.
- B.Sc., Physics and Mathematics, Iowa State University (Ames, USA), December 1988.

## **Work Experience**

- 2016-present: Director of Center for Advanced Materials Research
- 2012-2015: Director of the X-Ray Center for Material Analysis
- 2004-2008 and 2013/14: Chairman of Applied Physics Department, U. of Sharjah
- 2012-present: Associate Professor, University of Sharjah
- 2009-2012: Coordinator of the National X-ray Fluorescence Lab, U. of Sharjah
- 2000-2012: Assistant Professor, University of Sharjah
- June 2010: Visiting Scientist, University of Western Ontario (Canada)
- Summers of 2000-2012: Visiting Scientist, Purdue University (USA)
- 2001-2008: Physics Labs Coordinator, University of Sharjah
- 1993-1999: Graduate Research Assistant, Department of Physics, Purdue University
- 1990-1993: Graduate Teaching Assistant, Department of Physics, Purdue University

## **Knowledge and Skills**

- Design and setup of optical systems and modulation techniques.
- Practical knowledge of polishing, etching, and surface preparation of II-VI semiconductors.
- Material analysis using X-ray Fluorescence (XRF), Raman spectroscopy, and X-ray diffraction (XRD).
- Measurement of optical and intrinsic properties of semiconductors.
- Experience in working with laser systems, spectrometers, low level signal detection using lock-in amplifiers, detectors (UV, visible, IR), vacuum systems, X-ray diffraction systems, cryostats, superconducting magnet cryostat, ED-X-ray fluorescence systems, Raman systems, and cryogenic liquids.
- Experience in Linux, FORTRAN, C, Maple, and Labview.

## **Grants (last 5 years)**

<b>Title</b>	<b>Role</b>	<b>Amount (AED)</b>	<b>Source</b>	<b>Period</b>
Enhancing Analytical Capabilities for Environmental and Archaeological Applications	PI	1.65 million	IAEA	2012-2015
Synthesis and Characterization of Nickel Oxides/ Hydroxides Nanoparticles by Contact Glow Discharge Electrolysis for Supercapacitors Applications	PI	100,000	University of Sharjah	2014-2017
Microstructural, optical and thermal investigation of copper oxide nano-materials as selective absorbers for solar collectors applications	Co-PI	100,000	University of Sharjah	2014-2017
Identifying PM <sub>2.5</sub> Pollution Sources in Some Urban Areas of Sharjah	PI	80,000	University of Sharjah	2016-2018
Reduced Graphene Oxide-based Double Layer Capacitor for Alternating Current Line Filtering Application	Co-PI	160,000	University of Sharjah	2016-2018
Novel Metal Oxide/Amorphous Composite Coatings for Enhancing Silicon Solar Cells Photoconversion and for High Sensitivity Gas Sensors	Co-PI	80,000	University of Sharjah	2016-2018
Investigation of air pollutants and source apportionment in urban environments of ARASIA Member States related to PM <sub>10</sub> and PM <sub>2.5</sub> of atmospheric aerosols using nuclear and related analytical techniques	Co-PI	2.02 million (for all 7 member states)	IAEA	2016-2018
Enhancement of the power output and efficiency of dye-sensitized solar cells by investigating the counter electrode construction and natural organic sensitizers	Co-PI	400,000	Sharjah Research Academy & University of Sharjah	2018-2020
High-speed Micro-plasma-based True Random Bit Generator for Real-time Encryption Applications	Co-PI	350,000	Dubai Electronic Security Center	2019-2021
Enhancing the Performance of Low-Cost Ball-Milled Graphene in Energy and Environmental Applications	Co-PI	70,000	University of Sharjah	2017-2019
On the Chaotic Behavior of Electric and Spectral Emission Responses of Contact Glow Discharge Electrolysis	Co-PI	80,000	University of Sharjah	2016-2019

Coherent control of two-electron spin quantum bits in undoped GaAs/AlGaAs semiconducting quantum device	Co-PI	80,000	University of Sharjah	2018-2020
Novel metal oxide/nanoporous composite coatings for enhancing silicon solar cells photoconversion and for high sensitivity gas sensors	Co-PI	80,000	University of Sharjah	2017-2019

### **Publications in Refereed Journals (last 3 years)**

1. A. H. Alami, K. Aokal, M. A. Assad, D. Zhang, **H. Alawadhi**, and B. Rajab; *One-step synthesis and deposition of few-layer graphene via facile, dry ball-free milling*; MRS Advances **2 (15)**, pp 847-856 (2017).
2. R. Tanaka, K. Yuge, J. Kawai, and **H. Alawadhi**; *Artificial peaks in energy dispersive X-ray spectra: sum peaks, escape peaks, and diffraction peaks*; X-Ray Spectrometry **46 (1)**; pp 5-11 (2017).
3. A. Allagui, Z. Said, M. A. Abdelkareem, A. S. Elwakil, M. Yang, and **H. Alawadhi**; *DC and AC Performance of Graphite Films Supercapacitors Prepared by Contact Glow Discharge Electrolysis*; J. Electrochemical Society **164 (12)**, A2539-A2546 (2017).
4. A. Lafi, I. Shehadi, M. El Naggari, **H. Alawadhi**, H. E. Abdou, and A. A. Mohamed; *Forensic Nanotechnology: Engineering Polyaniline Nanocomposites for Latent Fingerprints Development*; Journal of Nanoscience and Nanotechnology **17 (5)**, pp 1-8 (2017).
5. A. Allagui, J. M. Ashraf, M. Khalil, M. A. Abdelkareem, A. S. Elwakil, and **H. Alawadhi**; *All-Solid-State Double-Layer Capacitors Using Binderless Reduced Graphene Oxide Thin Films Prepared by Bipolar Electrochemistry*; ChemElectroChem **4 (8)**, pp 2084-2090 (2017).
6. K. Daoudi, **H. Alawadhi**, S. El Helali, M. Boudard, Z. Othmen, M. Gaidi, M. Oueslati and T. Tsuchiya; *Effects of Mn<sub>3</sub>O<sub>4</sub> precipitates on the vibrational properties of epitaxial Ca-doped LaMnO<sub>3</sub> films*; J. Physics D: Applied Physics **50 (39)**, 395305 (2017).
7. N. M. Hamdan, **H. Alawadhi**, N. Jisrawi, M. Shameer; *Size resolved analysis of fine and ultrafine fractions of indoor particulate matter using energy dispersive X-ray fluorescence and electron microscopy*; X-ray Spectrometry **47 (1)**; pp 72-78 (2018).
8. N. M. Hamdan, **H. Alawadhi**, N. Jisrawi, M. Shameer; *Characterization of Fine Particulate Matter in Sharjah, United Arab Emirates Using Complementary Experimental Techniques*; Sustainability **10 (4)**, 1088 (2018).
9. K. A. Mosa, M. El-Naggari, K. Ramamoorthy, **H. Alawadhi**, A. Elnaggari, S. Wartanian, E. Ibrahim and H. Hani; *Copper Nanoparticles Induced Genotoxicity, Oxidative Stress Genotoxicity, Oxidative Stress, and Changes in Superoxide Dismutase (SOD) Gene Expression in Cucumber (Cucumis Sativus) Plants*; Frontiers in Plant Science **9**, 872 (2018).

10. A. H. Alami, M. A. Assad, K. Aokal, B. Rajab, **H. Alawadhi**; *Assessment of Photoelectrode Material Based on  $(\text{TiO}_2)_{1-x}/(\text{Al}_{65}\text{Cu}_{24}\text{Fe}_{11})_x$  in Dye-Sensitized Solar Cell Applications*; *Material Science Forum* **928**, p 94-99 (2018).
11. F. M. Khan, E. Saleh, **H. Alawadhi**, R. Harati, W. Zimmermann, and R. El-Awady; *Inhibition of exosome release by ketotifen enhances sensitivity of cancer cells to doxorubicin*; *Cancer Biology & Therapy* **19 (1)**, pp 25-33 (2018).
12. Z. A. Darwish, H. A. Kazem, K. Sopian, M. A. Alghoul, **H. Alawadhi**; *Experimental investigation of dust pollutants and the impact of environmental parameters on PV performance: an experimental study*; *Environment, Development and Sustainability* **20 (1)**, pp 155-174 (2018).
13. I. Ahmad, M. Islam, N. H. Alharthi, **H. Alawadhi**, T. Subhani, K. S. Munir, S. I. Shah, F. Inam, and Y. Zhu; *Chemical and structural analyses of the graphene nanosheet/alumina ceramic interfacial region in rapidly consolidated ceramic nanocomposites*; *Journal of Composite Materials* **52 (3)**; pp 417-428 (2018).
14. M. A. Abdelkareem, Y. Al Haj, M. Alajami, **H. Alawadhi**, N. Barakat; *Ni-Cd carbon nanofibers as an effective catalyst for urea fuel cell*; *Journal of environmental chemical engineering* **6 (1)**, pp 332-337 (2018).
15. A. E. Rojas, A. Allagui, A. S. Elwakil, **H. Alawadhi**; *True random bit generators based on current time series of contact glow discharge electrolysis*; *Journal of Applied Physics* **123 (20)**, pp 203301 (2018).
16. Z. Said, A. Allagui, M. Ali Abdelkareem, **H. Alawadhi**, K. Elsaid; *Acid-functionalized carbon nanofibers for high stability, thermoelectrical and electrochemical properties of nanofluids*; *Journal of Colloid Interface Science* **520**, pp 50-57 (2018).
17. T. Jan, S. Azmat, B. Wahid, M. Adil, **H. Alawadhi**, Q. Mansoor, Z. Farooq, SZ Ilyas, I. Ahmad, M. Ismail; *Chemically synthesized ZnO-Bi<sub>2</sub>O<sub>3</sub> (BZO) nanocomposites with tunable optical, photoluminescence and antibacterial characteristics*; *Materials Science in Semiconductor Processing* **84**, pp 71-75 (2018).
18. A. H. Alami, K. Aokal, A. Abu Hawili, R. Hasan, **H. Alawadhi**; *Facile preparation of graphene coated copper electrodes via centrifugal milling for capacitive deionization applications*; *Desalination* **446**, pp 51-58 (2018).
19. M. K. Hameed, I. M. Ahmady, **H. Alawadhi**, B. Workie, E. Sahle-Demessie, C. Han, M. M. Chehimi, A. A. Mohamed; *Gold-carbon nanoparticles mediated delivery of BSA: Remarkable robustness and hemocompatibility*; *Colloids and Surfaces A* **558**, pp 351-358 (2018).
20. A. A. Mohamed, S. N. Neal, B. Atallah, N. D. AlBab, **H. Alawadhi**, Y. Pajouhafsar, H. E. Abdou, B. Workie, E. Sahle-Demessie, C. Han, M. Monge, J. M. Lopez-de-Luzuriaga, J. H. Reibenspies, M. M. Chehimi; *Synthesis of gold organometallics at the nanoscale*; *Journal of Organometallic Chemistry* **877**, pp 1-11 (2018).
21. E. T. Sayed, T. Eisa, H. O. Mohamed, M. A. Abdelkareem, A. Allagui, **H. Alawadhi**, K. Chae; *Direct urea fuel cells: Challenges and opportunities*; *Journal of Power Sources* **417**, pp 159-175 (2019).

22. D. Zhang, A. Taieb, A. H. Alami, K. Aokal, **H. Alawadhi**, J. Abed, L. Bichara; *A cost-effective nanoparticle-gap-film SERS sensor using graphene nanospacer by one-step transfer-free mechanical milling*; Journal of Applied Physics **125** (6), 063102 (2019).
23. Z. Said, A. Allagui, M. A. Abdelkareem, A. S. Elwakil, **H. Alawadhi**, R. Zannerni, K. Elsaid; *Modulating the energy storage of supercapacitors by mixing close-to-ideal and far-from-ideal capacitive carbon nanofibers*; Electrochimica Acta **301**, pp 465-471 (2019).
24. A. H. Alami, B. Rajab, J. Abed, M. Faraj, A. Abu Hawili, **H. Alawadhi**; *Investigating various copper oxides-based counter electrodes for dye sensitized solar cell applications*; Energy **174**, pp 526-533 (2019).
25. A. G. Al-Nuairi, K. A. Mosa, M. G. Mohammad, A. El-Keblawy, S. Soliman, H. Alawadhi; *Biosynthesis, Characterization, and Evaluation of the Cytotoxic Effects of Biologically Synthesized Silver Nanoparticles from Cyperus conglomeratus Root Extracts on Breast Cancer Cell Line MCF-7*; Biological Trace Element Research (DOI <https://doi.org/10.1007/s12011-019-01791-7>), pp 1-10 (2019).