CURRICULUM VITAE

Alaa F. Abd El-Rehim

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PERSONAL DETAILS

Date and Place of Birth: Feb. 5, 1974 – Cairo, Egypt.
Nationality: Egyptian
Marital Status: Married – three children

EDUCATION

2004 Ph.D. Physics (Materials Science), Ain Shams University, Cairo, Egypt
2000 M.Sc. Physics (Materials Science), Ain Shams University, Cairo, Egypt
1997 Special Diploma in Physics, Ain Shams University, Cairo, Egypt
1996 General Diploma in Physics, Ain Shams University, Cairo, Egypt
1995 B.Sc. in Physics & Chemistry, Ain Shams University, Cairo, Egypt

Title of Ph.D. dissertation: Study of microstructural changes of some alloys using mechanical creep measurements and positron annihilation techniques
Advisor: Prof. Dr. Gergis Griass

Title of M.Sc. dissertation: Study of some mechanical properties under different thermal conditions for some alloys
Advisor: Prof. Dr. Gergis Griass

ACADEMIC EMPLOYMENT

1. Professor of Physics (09/2014−Present), Physics Department, Faculty of Science, King Khalid University, Abha, **Saudi Arabia (Current Position)**

2. Professor of Physics (11/2017−Present), Physics Department, Faculty of Education, Ain Shams University, Cairo, **Egypt (Permanent Position)**

3. Associate Professor of Physics (11/2011−10/2017), Physics Department, Faculty of Education, Ain Shams University, Cairo, **Egypt**

4. Assistant Professor of Physics (10/2004−10/2011), Physics Department, Faculty of Education, Ain Shams University, Cairo, **Egypt**

5. Associate Professor of Physics (09/2009−06/2014), Basic Science Department, Higher Technological Institute, Tenth of Ramadan City, Zagazig, **Egypt (Part-time Position)**

6. Assistant Professor of Physics (04/2007−04/2009), Basic Science Department, Prince Sultan Military College of Health Sciences, Dhahran, **Saudi Arabia**

7. Visiting Professor (10/2005−01/2006), Physics Department, Faculty of Education, Sana'a University, **Republic of Yemen**

8. Assistant Lecturer of Physics (06/2000−09/2004), Physics Department, Faculty of Education, Ain Shams University, Cairo, **Egypt**

9. Instructor of Physics (01/1996−05/2000), Physics Department, Faculty of Education, Ain Shams University, Cairo, **Egypt**

GRANT AND SCHOLARSHIP AWARDS

June 2013-September 2013 Post-doctoral fellow (Parown-Egypt), School of Materials, Faculty of Engineering & Physical Sciences, **The University of Manchester, UK.**

Title of Research: "Microstructural evolution in some Magnesium alloys during processing"
Host Professor: Prof. Dr. Joseph Robson

RESEARCH INTERESTS

My research interests broadly pursue improving fundamental understanding of the effect of microstructural changes on the mechanical properties of alloys such as hardness, creep, stress-strain, and fatigue, enhancing the performance of alloys by means of heat treatment. I have designed and built testing devices for the purpose of assessing effects of various parameters and processing conditions on mechanical performance of alloys, especially when subjected to cyclic loading conditions.

I have also an active interest in developing a better understanding of the effects of processing and service on the microstructure of alloys through the use of electron microscopy and X-ray analysis. Ongoing work includes investigating microstructure evolution of novel wrought magnesium alloys.

Competent experimenter: SEM, XRD, DTA

Computer: MatLab & EndNotes programs, Origin, Word, Excel, Power Point, SAS.

SCIENTIFIC PROJECTS

1. Principal investigator for a research project entitled "Microstructure and mechanical properties of AZ91 magnesium alloys for biomedical applications" sponsored by King Khalid University, Abha, Saudi Arabia, 05/2025-till now. **(in progress)**
   Project Code: R.G.P. 2/140/46

2. Principal investigator for a research project entitled "Advanced polymer structures for enhanced organic solar cell efficiencies" sponsored by Research Support Programs for Central Laboratories at King Khalid University, Abha, Saudi Arabia, 04/2024-till now. **(in progress)**
   Project Code: CL/RP/1

3. Principal investigator for a research project entitled "Synthesis, structural, optical, and spectroscopic studies on new transparent glass systems for photonic and radiation shielding applications" sponsored by King Khalid University, Abha, Saudi Arabia, 04/2023-03/2024. **(Closed)**
   Project Code: R.G.P. 2/296/45

4. Principal investigator for a research project entitled "Effect of Sn addition on some microstructure and mechanical properties of Zn-Cu alloy" sponsored by King Khalid University, Abha, Saudi Arabia, 03/2023-03/2024. **(Closed)**
   Project Code: R.G.P. 2/325/44

5. Principal investigator for a research project entitled "Chemically functionalized graphene and their applications in electrochemical energy conversion and storage" sponsored by **the Ministry of Education**, Saudi Arabia, 10/2022-10/2023. **(Closed)**
   Project Code: IFB-PHASE2/15/4

6. Principal investigator for a research project entitled "Synthesis and characterization of porous materials using electrochemical etching to optimize the physical properties using first-principles calculations" sponsored by King Khalid University, Abha, Saudi Arabia, 04/2022-04/2023. **(Closed)**
   Project Code: R.G.P. 2/60/43

7. Principal investigator for a research project entitled "Development of Sn-Ag-Cu lead-free solders in electronics packaging" sponsored by King Khalid University, Abha, Saudi Arabia, 04/2021-04/2022. **(Closed)**
   R.G.P. 2/69/42

8. Principal investigator for a research project entitled "Study of lead-free solders for electronic packaging and assembly" sponsored by King Khalid University, Abha, Saudi Arabia, 01/2020-12/2021. **(Closed)**
   Project Code: R.G.P. 2/93/41

9. Principal investigator for a research project entitled “Study of Mechanical, optical properties, and radiation shielding competence of zinc-tellurite glasses” sponsored by King Khalid University, Abha, Saudi Arabia, 01/2021-03/2022. **(Closed)**
   Project Code: GRP/162/42

10. Principal investigator for a research project entitled “Microstructure and mechanical properties of lead-free solders for electronic packaging and assembly” sponsored by King Khalid University, Abha, Saudi Arabia, 04/2020-02/2021. **(Closed)**
    Project Code: R.G.P. 2/69/42

11. Principal investigator for a research project entitled “Development of the novel metallorganic frameworks for selective gas sorption (DNMFSGS)” sponsored by King Khalid University, Abha, Saudi Arabia, 05/2019-12/2021. **(Closed)**
    Project Code: R.G.P. 2/43/40

12. Co-investigator for a research project entitled “Effect of Cu addition on the microstructure and mechanical properties of Sn-Zn solder alloy” sponsored by King Khalid University, Abha, Saudi Arabia, 05/2019-11/2020. **(Closed)**
    Project Code: R.G.P. 1/277/42

13. Principal investigator for a research project entitled “Development of lead-free solders for electronic applications (DLFSEA)” sponsored by King Khalid University, Abha, Saudi Arabia, 08/2018-04/2020. **(Closed)**
    Project Code: R.G.P. 1/60/39

14. Principal investigator for a research project entitled “Microstructure evolutions and mechanical properties of Sn-Cu solder alloy reinforced with ZnO nanoparticles” sponsored by King Khalid University, Abha, Saudi Arabia, 03/2018-01/2019. **(Closed)**
    Project Code: R.G.P. 240/39

15. Co-investigator for a research project entitled “Effect of C_3N_4 nanoparticles addition on the microstructure and mechanical properties of Sn–Ag–Cu solder alloy” sponsored by King Khalid University, Abha, Saudi Arabia, 03/2017-03/2018. **(Closed)**
    Project Code: G.R.P. 262/38

16. Co-investigator for a research project entitled “Designing and characterizations of advanced functional quantum materials using experimental and theoretical approaches for modern and advanced applications” sponsored by King Khalid University, Abha, Saudi Arabia, 06/2017-09/2018. **(Closed)**
    Project Code: R.G.P. 2/3/38

17. Principal investigator for a research project entitled “Effect of Bi addition on the microstructure and mechanical properties of Sn-Ag solder alloy” sponsored by King Khalid University, Abha, Saudi Arabia, 03/2017-12/2017. **(Closed)**
    Project Code: G.R.P 260/38

REFEREED PUBLICATIONS

1. **A.F. Abd El-Rehim**, H.Y. Zahran, A.E. Shamaki, E.H. Aamer, "Modeling and experimental study of indentation creep behavior of Zn-4Cu-Sn alloys using an artificial neural network", The European Physical Journal Plus, under review, 2025.

2. H.Y. Zahran, **A.F. Abd El-Rehim**, A.E. Shamaki, "Microstructure evolution and mechanical features of biodegradable Zn-4Cu-Sn alloys", Journal of Physics Open, under review, 2025.

3. Z. Rehman, A. Saddiqa, **A.F. Abd El-Rehim**, A. Parveen, H.Y. Zahran, Z. Abbas, "Density functional modelling of lead-free Sn-based AmSnX3 (Am=Rb, Cs; X=Cl, Br, I) perovskites as sustainable materials for optoelectronics and solar cell applications", Journal of Molecular Graphics and Modelling, Volume 142, 109227, 2026.

4. S. Noreen, A. Awais, **A.F. Abd El-Rehim**, A. Parveen, H.Y. Zahran, I.S. Yahia, Z. Abbas, Synergistic experimental–dft investigation into photocatalytic efficiency of M-Type $XFe_{12}O_{19}$ (X = Ba, Sr) hexaferrites, Chinese Journal of Physics, in press, 2026.

5. S. Saleem, A. Khalid, S.B. Khalifa, H.H. Aldosari, S. Chebaane, **A.F. Abd El-Rehim**, M.A. Munir, R. Akbar, "Investigating the modified opto-physical response of nickel oxide by cobalt doping for high-performance photodetectors", Physica B, Volume 719, 417950, 2025.

6. C.C. Nwaeju-Okechukwu, S.O. Okuma, A.F. Abd El-Rehim, H.Y. Zahran, F.O. Edoziuno, "Optimization of physical and hardness properties of epoxy composites reinforced with Meretrix lusoria Shell particulates using RSM", Results in Chemistry, Volume 18, 102771, 2025.

7. A. Awais, Z. Rehman, M. Shafiq, **A.F. Abd El-Rehim**, M.Q. Shah, A. Jaffar, H.Y. Zahran, H. Abdul Rahman, "First-principles study of lead-free $Na_2TmAgCl_6$ and $Na_2TmCuCl_6$ double halide perovskites for photovoltaic and thermoelectric applications", Journal of Molecular Graphics and Modelling, Volume 141, 109157, 2025.

8. R. Manoranjitham, P.S.P. Reddy, S. Sindhu Kavi, S. De, E.R. Kumar, Ch. Srinivas, H.B. Ramalingam, **A.F. Abd El-Rehim**, "Natural fuel assisted biogenic synthesis of ZnO nanoparticles: Evaluation of crystallite size, optical band gap and gas sensing ability", Journal of Alloys and Compounds, Volume 1018, 179232, 2025.

9. S. Sen, A. Ghosh, Ar. Ghosh, G. Shankar, **A.F. Abd El-Rehim**, M. Ghosh, "Investigation of the role of non-octahedral slip planes in tensile deformation behaviour of naturally aged aluminium 6061 alloy", Metals and Materials International, Volume 31, 1996–2012, 2025.

10. R.P. Selvaraj, K.A. Naseer, M.K. Poojha, G. Muralidharan, K. Marimuthu, **A.F. Abd El-Rehim**, M.I. Sayyed, Tailoring the Alkali/Alkaline modifier incorporated borophospho-silicate glasses for enhanced Radiation attenuation and Nuclear waste management applications, Materials Today Communications, Volume 46 , 112651, 2025.

11. A. Satish, R.K. Chava, T. Pusphagiri, E.R. Kumar, M. Ganapathy, S.M. Naidu, M. Saravanakumar, **A.F. Abd El-Rehim**, M. Kang, Deep-eutectic solvent-assisted synthesis of bismuth tungstate microsphere impregnated with rGO for the maximization of 4-nitrophenol and acid orange 10 degradation through photocatalysis, Diamond & Related Materials, Volume 153, 112111, 2025.

12. M.N. Namboothiri, K.A. Naseer, K. Marimuthu, M.I. Sayyed, **A.F. Abd El-Rehim**, "Fabrication, structural features and radiation prevention potential of Europium incorporated multi-modifier Li–Al borophospho-silicate glasses", Radiation Physics and Chemistry, Volume 229, 112505, 2025.

13. G. Magesh, A.P. Arun, R.V. Poonguzhali, E. R. Kumar, I. Pradeep, R.R Kumar, **A.F. Abd El-Rehim**, "Pure α-MnO2 and Ag decorated α-MnO2 nanorods for photocatalytic activity", Journal of Molecular Structure, Volume 1329, 141444, 2025.

14. S.A. Bassam, K.A. Naseer, K.A. Mahmoud, C.S.S. Sangeeth, M.I. Sayyed, **A.F. Abd El-Rehim**, M.U. Khandaker, "Influence of transition metals on the radiation shielding capability of Eu^{3+} ions doped telluro borophosphate glasses", Nuclear Engineering and Technology, Volume 57, 103229, 2025.

15. F.O. Edoziuno, B.U. Odoni, C.C. Nwaeju, M.S. Kumar, **A.F. Abd El-Rehim**, "Mechanical and structural performance of hardwood charcoal-reinforced polyester composites: effects of particle size and filler loading", Results in Engineering, Volume 25, 104110, 2025.

16. M.L. Edward, M.R. Ranjitha, G. Thennarasu, E.R. Kumar, **A.F. Abd El-Rehim**, V. Jaisankar, "A high-performance flexible biopolymer-based Ce oxide composite electrolyte for lithium-ion battery dendrite reduction", Materials Science in Semiconductor Processing, Volume 187, 109101, 2025.

17. R. Punniyamoorthy, S. Sridhar, E. Ranjith Kumar, A. Kalaivanai, A. Raja, M. Kang, **A.F. Abd El-Rehim**, "Preparation and investigation of physicochemical properties of g-C_3N_4/$LaCoO_3$ heterostructure for photocatalytic dye degradation", Diamond & Related Materials, Volume 150, 111747, 2025.

18. R.R. Krishnan, M.N.V.N. Namboothiri, K.A. Naseer, M.I. Sayyed, **A.F. Abd El-Rehim**, K. Marimuthu, Enhancing radiation shielding efficiency through modifiers in potassium incorporated phospho-tellurite glasses, Optical Materials, Volume 157, 116147, 2024.

19. M.M. Mousa, **A.F. Abd El-Rehim**, S.M. Abdelaziz, Influence of Cr inclusion on the microstructural evolutions and tensile properties of Sn-5 wt% Sb solder alloy, Journal of Materials Science: Materials in Electronics, Volume 35, 1888, 2024.

20. M.K. Poojha, K.A. Naseer, U.K. Kagola, S.A. Bassam, **A.F. Abd El-Rehim**, K. Marimuthu, Assessment of luminescent features on Sm3+ ions doped LiF assimilated lead-free borate

glasses for visible photonic and optoelectronic applications, Optical Materials, Volume 157, 116147, 2024.

21. S. Afsheen, K. Shahzadi, T. Iqbal, M. Zafar, R. Saleem, M.A. Sayed, **A.F. Abd El-Rehim**, A.M. Ali, "Achyranthes aspera-based biosynthesis of silver nanoparticles to investigate the efficacy against mosquito larvae", Biomass Conversion and Biorefinery, Volume 14, 13323–13332, 2024.

22. C. Sasirekha, K.A. Naseer, K. Marimuthu, **A.F. Abd El-Rehim**, M. Vijayakumar, Enhanced spectroscopic abilities of Eu3+ions doped in Barium boro-phosphate glasses for Optoelectronic devices, Optical Materials, Volume 156, 115942, 2024.

23. S.M. Abdelaziz, H.Y. Zahran, **A.F. Abd El-Rehim**, M. Abd El-Hafez, , "Effects of trace addition of Fe on the thermal, microstructure, and tensile creep properties of Sn-0.7Cu eutectic alloy", Journal of Materials Science: Materials in Electronics, Volume 35, 837, 2024.

24. V. Susithra, S. Sindhu Kavi, **A.F. Abd El-Rehim**, E. Ranjith Kumar, "Citrus sinensis assisted biogenic synthesis and physicochemical properties of Fe_3O_4 nanoparticles for antibacterial activity", Ceramics International, Volume 50, 10225–10231, 2024.

25. S. Sindhu Kavi, V. Susithra, **A.F. Abd El-Rehim**, E. Ranjith Kumar, "Natural grape juice assisted synthesis of metal oxide nanoparticles: Evaluation of microstructural, vibrational and colloidal stability analysis for Liquified Petroleum Gas (LPG) sensor applications", Sensors and Actuators B: Chemical, Sensors and Actuators: B. Chemical, Volume 406, 13545, 2024.

26. A.E. Shamaki, H.Y. Zahran, **A.F. Abd El-Rehim**, "Effect of Sn addition on the microstructure and age-hardening response of the Zn-4Cu alloy", Crystals, Volume 13, 1635, 2023.

27. C.A. Paul, E.R. Kumar, **A.F. Abd El-Rehim**, G. Yang, "Cobalt oxide nanoparticles for biological applications: Synthesis and physicochemical characteristics for different natural fuels", Ceramics International, Volume 49, 40244–40257, 2023.

28. M. Sohaib, T. Iqbal, S. Afsheen, M.B. Tahir, A. Masood, M. Rafique, K.N. Riaz, M.A. Sayed, **A.F. Abd El-Rehim**, A.M. Ali, "Novel sol–gel synthesis of Mo-doped ZnO-NPs for photo-catalytic waste water treatment using the RhB dye as a model pollutant", Environment, Development and Sustainability, Volume 25, 11583–11598, 2023

29. M.I. Sayyed, H. Y. Morshidy, Kh.S. Shaaban, **A.F. Abd El-Rehim**, A.M. Ali, M.S. Sadeq, "Impacts of BaO additions on structure, linear/nonlinear optical properties and radiation shielding competence of BaO-NiO-ZnO-B2O3 glasses", Optical Materials, Volume 144, 114300, 2023.

30. X. Chen, S. Wang, Y. Jin, M. Han, M. Li, H. Gao, H. Yang, L. Fang, A.V. Jagadeesha, **A.F. Abd El-Rehim**, A.M. Ali, D. Li, "Construction of $CeO_2/PbFe_{12}O_{19}$ heterojunction photocatalysts and their preference for the photodegradation of −C=O and $-CONH_2$", ChemistrySelect, Volume 8, e202204779, 2023.

31. C.A. Paul, E.R. Kumar, J. Suryakanth, **A.F. Abd El-Rehim**, "Analysis and characterization of structural, morphological, thermal properties and colloidal stability of CuO nanoparticles for various natural fuels", Ceramics International, Volume 49, 31193–31209, 2023.

32. M.I. Sayyed, M.S. Sadeq, Kh.S. Shaaban, **A.F. Abd El-Rehim**, A.M. Ali, H.Y. Morshidy, "Elucidating the effect of La_2O_3–B_2O_3 exchange on structure, optical and radiation shielding improvements of Na_2O–NiO–B_2O_3 glass", Optical Materials, Volume 142, 114051, 2023.

33. C.A. Paul, E.R. Kumar, J. Suryakanth, **A.F. Abd El-Rehim**, "Structural, microstructural, vibrational, and thermal investigations of NiO nanoparticles for biomedical applications", Ceramics International, Volume 49, 27230–27246, 2023.

34. T. Pusphagiri, E.R. Kumar, A. Ramalingam, **A.F. Abd El-Rehim**, Ch. Srinivas, "Effect of doping concentration on structural, vibrational, morphological and colloidal stability of Zn doped NiO nanoparticles for gas sensor applications", Ceramics International, Volume 49, 23903–23911, 2023.

35. N. Kaur, R. Sharma, Y. Al-Douri, V. Srivastava, **A.F. Abd El-Rehim**, "Thermodynamic, thermoelectric and optoelectronic performances of Co_2MB (M = Nb, Ta) full-heusler compounds for solar cell and UV absorber applications", Materials Science in Semiconductor Processing, Volume 165, 107676, 2023.

36. Y. Han, S. Wang, M. Li, H. Gao, M. Han, H. Yang, L. Fang, J.V. Angadi, **A.F. Abd El-Rehim**, A.M. Ali, D. Li, "Strontium-induced phase, energy band and microstructure regulating in Ba1-xSrxTiO$_3$ photocatalysts for boosting visible-light photocatalytic activity", Catalysis Science & Technology, Volume 13, 2841–2854, 2023.

37. H.Y. Zahran, **A.F. Abd El-Rehim**, A.S. Mahmoud, Thermal, microstructure, and mechanical features of Bi-containing Sn-1Ag-0.5Cu lead-free solders", Journal of Electronic Materials, Volume 52, 4841–4852, 2023.

38. S.M. Abdelaziz, H.I. Lebda, **A.F. Abd El-Rehim**, D.M. Habashy, "Modeling and experimental investigation of indentation creep behavior of hypoeutectic Sn-Bi and Sn-Bi-Sb_2O_3 alloys using genetic programming approach", Physica Scripta, Volume 98, 065912, 2023.

39. P. Anilkumar, T. Kalaivani, S. Deepak, J. Jasmin, **A.F. Abd El-Rehim**, E.R. Kumar, "Evaluation of structural, optical and morphological properties of La doped TiO_2 nanoparticles", Ceramics International, Volume 49, 16991–16998, 2023.

40. S. Ananthi, M. Kavitha, A. Balamurugan, E.R. Kumar, G. Magesh, **A.F. Abd El-Rehim**, Ch. Srinivas, P. Anilkumar, J. Suryakanth, C.S. Rahale, "Synthesis, analysis and characterization of camellia sinensis mediated synthesis of NiO nanoparticles for ethanol gas sensor applications", Sensors and Actuators B: Chemical, Volume 387, 133742, 2023.

41. Kh.S. Shaaban, A.M. Al-Baradi, B.M. Alotaibi, **A.F. Abd El-Rehim**, "Mechanical and radiation shielding features of lithium titanophosphate glasses doped BaO", Journal of Materials Research and Technology, Volume 23, 756–764, 2023.

42. S.A. Khandy, I. Islam, K. Kaur, A.M. Ali, **A.F. Abd El-Rehim**, "Electronic structure, stability, photocatalytic and optical properties of new lead-free double perovskites Tl2PtX6 (X = Cl, Br) for light-harvesting applications", Materials Chemistry and Physics, Volume 297, 127293, 2023.

43. E.A. Abdel Wahab, H.A. Alyousef, **A.F. Abd El-Rehim**, Kh.S. Shaaban, "Basicity, optical features, and neutron/charged particles attenuation characteristics of P_2O_5-As_2O_3-PbO glasses doped tungsten ions", Journal of Electronic Materials, Volume 52, 219–236, 2023.

44. A. Pasha, **A.F. Abd El-Rehim**, A.M. Ali, S.K. Me, S.O. Manjunatha, S. Wang, A.V. Jagadeesha, "High performance EMI shielding applications of $Co_{0.5}Ni_{0.5}Ce_xSm_yFe_{2-x-y}O_4$", nanocomposite thin films", Ceramics International, Volume 49, 2224–2235, 2023.

45. S.S. Sundari, M. Mehala, N. Arunadevi, P. Kanchana, S.S. Alharthi, E.R. Kumar, Y. Al-Douri, **A.F. Abd El-Rehim**, "Structural and optical properties of salicyl-N-methyl-4-stilbazolium tosylate: Thermal, DFT, MEP and Hirshfeld surface analysis", Journal of Molecular Structure, Volume 1271, 134072, 2023.

46. Y. Al-Douri, M. M. Khan, J.R. Jennings, **A.F. Abd El-Rehim**, "Nanomaterial-based biosensors for COVID-19 detection", Critical Reviews in Solid State and Materials Sciences, Volume 47, 955–978, 2022.

47. A.M. Aboraia, A.A. Darwish, H.Y. Zahran, I. S. Yahia, **A.F. Abd El-Rehim**, P.A. Rud, V.V. Butova, A.V. Soldatov, "Structural, morphological, and optical analysis of La-doped NiO films fabricated by the sol-gel spin-coating technique for solid-state electronics", Journal of Surface Investigation: X-ray, Synchrotron and Neutron Techniques, Volume 16, 1048–1054, 2022.

48. Kh.S. Shaaban, B.M. Alotaibi, N. Alharbiy, A.M. Al-Baradi, **A.F. Abd El-Rehim**, "Impact of TiO_2 on DTA and elastic moduli of calcium potassium borophosphosilicate glasses in prelude for use in dental and orthopedic applications", Silicon, Volume 14, 11991–12000, 2022.

49. M. Farooq, T. Iqbal, K.N. Riaz, A.M. Ali, **A.F. Abd El Rehim**, "Simple synthesis of Ni doped MoS_2 nanoparticles and their application as efficient photocatalyst: experiment and COMSOL simulation", Chemical Papers, Volume 76, 7493–7506, 2022.

50. Kh.S. Shaaban, H.A. Alyousef, B.M. Alotaibi, **A.F. Abd El-Rehim**, E. A. Abdel Wahab, "The vital role of TiO_2 on the bioglass system P_2O_5-CaO-B_2O_3-SiO_2-K_2O for optics and shielding characteristics", Journal of Inorganic and Organometallic Polymers and Materials, Volume 32, 4295–4303, 2022.

51. A.M. Al-Baradi, B.M. Alotaibi, N. Alharbi, **A.F. Abd El-Rehim**, Kh. S. Shaaban, "Gamma radiation shielding and mechanical studies on highly dense lithium iron borosilicate glasses modified by zinc oxide", Silicon, Volume 14, 10391–10399, 2022.

52. Kh. S. Shaaban, Haifa A. Alyousef, **A.F. Abd El-Rehim**, "CeO_2 reinforced B_2O_3–SiO_2–MoO_3 glass system: A characterization study through Physical, mechanical and gamma/ neutron shields characteristics", Silicon, 14, pages12001–12012, 2022.

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55. A.A. El-Maaref, B.M. Alotaibi, N. Alharbi, **A.F. Abd El-Rehim**, Kh. S. Shaaban, "Effect of Fe_2O_3 as an aggregate replacement on mechanical, and gamma/ neutron radiation shielding properties of phosphoaluminate glasses", Journal of Inorganic and Organometallic Polymers and Materials, Volume 32, 3117–3127, 2022.

56. S.A. Algarni, A.A. El-Maaref, B.M. Alotaibi, N. Alharbiy, **A.F. Abd El-Rehim**, E. A. Abdel Wahab, Kh. S. Shaaban, "Physical, optical, and radiation shielding features of yttrium lithium borate glasses", Journal of Inorganic and Organometallic Polymers and Materials, Volume 32, 2873–2881, 2022.

57. L. Mohamed, M. Noureddine, B. Mokhtar, Y. Al-Douri, B. Djillali, B. Lakhdar, **A.F. Abd El-Rehim**, M. Jadan, "Dislocations and crystallite size distribution of cadmium oxide thin films synthesized by spray pyrolysis technique", Materials Science and Engineering B, Volume 286 116055, 2022.

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59. B. Rani, A.F. Wani, U.B. Sharopov, L. Patra, J. Singh, A.M. Ali, **A. F. Abd El-Rehim**, S.A. Khandy, S. Dhiman, K. Kaur, "Electronic Structure, Phonon spectrum and effective mass related thermoelectric properties of PdXSn (X=Zr, Hf) half Heuslers", Molecules, Volume 27, 6567, 2022.

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4. 15th Annual Scientific Research Day, King Khalid University, 2019, Abha, Saudi Arabia, **(Participate)**
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9. 4th Scientific Research Meeting, Physics Department, King Khalid University, 2019, Abha, Saudi Arabia

SUPERVISING M.Sc and Ph.D CANDIDATES

1. Aysha Ebraheem M. Shamaki **(Ph.D candidate in Physics)** "Effect of Sn addition on some microstructure and mechanical properties of Zn-Cu alloy" Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia, 10/2022-till now.

2. Hana Masoud Al-Masoud **(M.Sc candidate in Physics)** "Study of some microstructure and mechanical properties of AZ91 magnesium alloy" Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia, 04/2016-10/2019.

3. Shaimaa Mahmoud Kandil **(M.Sc candidate in Physics)** "Correlation of positron annihilation parameters with the mechanical properties of some Al alloys" Physics Department, Faculty of Education, Ain Shams University, Cairo, Egypt 09/2011-12/2017.

4. Marwa Abdel-Hafaz El-Boraey **(Ph.D candidate in Physics)** "Effect of heat treatment and Cu additions on the mechanical and structural properties of Al-Zn alloy" Physics Department, Faculty of Education, Ain Shams University, Cairo, Egypt 08/2011-05/2014.

5. Reham Mahmoud Abdel-Rahman **(M.Sc candidate in Physics)** "Study the effect of heat treatment on the mechanical behavior of a solder alloy" Physics Department, Faculty of Education, Ain Shams University, Cairo, Egypt 05/2008–06/2011.

SUPERVISING B.Sc. CANDIDATES

1. Lama Ali Mohamed, "Laser and its applications in service life", second term (2021–2022), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

2. Anwar Fahd Asser, "X-rays and some of their applications", second term (2021–2022), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia .

REVIEWER OF RESEARCH PROJECTS AND REPORTS

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2. Internal reviewer of **Ph.D proposal** for **Amnah M. Al-Qahtani**, (Catalytic Performance and Water Treatment Applications of CeO_2-Decorated Cu/Co Bimetallic Oxide Metal Catalysts),

second term (2024–2025), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

3. Internal reviewer of **M.Sc report** for **Mona Mushabab AlKulthumi**, (Synthesis and study of the photoconductivity properties of vanadium pentoxide (V2O5) and its comparison with commercial vanadium pentoxide), first term (2024–2025), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

4. Internal reviewer for **the undergraduate research report** entitled (Photoconductivity of TlGaTe2 single crystal and its dependence on the intensity of white light) first term (2024–2025), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

5. Internal reviewer of **M.Sc progress seminar** for **Omar Abdullah Al-Otaibi**, (Synthesis and characterization of pure and doped copper oxide (CuO) nanostructures for optoelectronic applications), first term (2023–2024), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

6. Internal reviewer of **M.Sc report** for **Surayyi Mousa Hassam AlShehri**, (Synthesis and characterization of pure and doped copper oxide (CuO) nanostructures for optoelectronic applications), first term (2023–2024), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

7. Internal reviewer of **Ph.D proposal** for **Norah Hadi Alqhtani**, (Investigation of optical, morphological and structural properties of Fe_2O_3-TiO_2 nanocomposites for environmental remediation), second term (2022–2023), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

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19. Internal reviewer for **the undergraduate research report** entitled (Extended Experimental study on pure and Gd-doped tellurite glass), second term (2018–2019), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

20. Internal reviewer of **M.Sc Thesis** for **Seda Gherman Al-Amri**, (Effect of metal doping on the properties of nanostructure PbI_2: Toward functionalized semiconductor radiation detector) Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia (2018).

21. Internal reviewer of **M.Sc report** for **Azah Mohsen Ahmed**, (Photon management for more efficient thin film solar cells), first term (2016–2017), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

22. Internal reviewer for **the undergraduate research report** entitled (Cooling of metal bar by conduction and convection), first semester (2018–2019), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

23. Internal reviewer for **the undergraduate research report** entitled (Fine structure of atomic energy levels in light and heavy elements in view of spin-orbit coupling), second semester (2017–2018), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia..

24. Internal reviewer for **the undergraduate research report** entitled (Determination of inter-planar Spacing of NaCl Crystal by X-ray diffraction method), first semester (2016–2017), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

25. Internal reviewer for **the undergraduate research report** entitled (Theoretical study of some electro-optical properties of zinc oxide), second term (2015–2016), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

26. Internal reviewer for **the undergraduate research report** entitled (Estimate an amount of sugar in a water solution by using a laser beam), second term (2014–2015), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

27. Internal reviewer for **the undergraduate research report** entitled (Ground Penetrating Radar (GPR)), First term (2014–2015), Physics Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia.

AWARDS AND HONORS

1. The world's top 2% of most influential scientists issued by Stanford University Scientists Rankings (2024).

2. The world's top 2% of most influential scientists issued by Stanford University Scientists Rankings (2023).

3. Citation Award within the incentive awards program of the Deanship of Scientific Research, King Khalid University, Abha, Saudi Arabia (2023).

3. Who's Who in the World, 26th edition, MARQUIS, 2009.

PROFESSIONAL TRAINING / COURSES RECEIVED

✓	Blackboard Collaborate	King Khalid University, KSA	03/2017
✓	Beginners Reference Management with Endnote	University of Manchester, UK	07/2013
✓	Wiley Publishing Workshop	University of Manchester, UK	06/2013
✓	Faculty and Leadership Development Project (FLDP)	Ain Shams University	05/2011
✓	The role of mass communication in the medication errors program		06/2008
✓	Information & Communication Technology Project (ICTP)		06/2006
✓	Educational Course for Juniors/Assistants (ECJ)		10/1998
✓	Computer and Commercial Applications (CCA)		03/1998

MEMBERSHIP OF SCIENTIFIC SOCIETIES

- ✓ Member of the Saudi Physical Society (KSA)
- ✓ Member of the Researcher ID Community (Philadelphia, USA)
- ✓ Member of the Egyptian Society of Solids (Cairo, Egypt)
- ✓ Member of Egyptian Syndicate of Scientific Professions (Cairo, Egypt)

TEACHING EXPERIENCE

I have been in charge of teaching the following undergraduate and postgraduate courses at King Khalid University **(Saudi Arabia)**, Prince Sultan Military College of Health Sciences **(Saudi Arabia**), Sana'a University **(Yemen)**, and Ain Shams University **(Egypt)** according to the credit hours system.

- ♦ **Undergraduate courses:**
  1. General Physics
  2. Thermodynamics
  3. Alternating Current & Electronics
  4. Properties of Matter
  5. Heat
  6. Solid State Physics
  7. Optics and laser
  8. Modern Physics
  9. Electricity & Magnetism
  10. Waves & Vibrations
  11. Quantum Physics
  12. Atomic & Nuclear Physics
  13. History and Philosophy of Physics Science
- ♦ **Postgraduate courses:**
  1. Physics of Crystalline State
  2. Metallurgy Physics
  3. Radiation Physics and Detectors
  4. Special Course in Physics for Master students

TEACHING PHILOSOPHY

As a physics teacher I strive to provide the students with the concepts of a subject and teach them how to find logical links between cause and effect. The knowledge of basic concepts empowers the student to derive mathematical equations rather than memorize them. Conceptual understanding, however, is not the only important part of physics knowledge. Another important part of the teaching process is to develop the problem-solving skills of the student. To encourage students to sharpen their problem-solving skills and critical thinking abilities I present examples in the

classroom that are chosen to build a bridge between the concepts and their applications. I then assign homework problems, which help students to explore, evaluate, and refine their own knowledge in light of new experiences. To help students achieve these goals I stay always close to my students and have informal discussions of the homework problems and other concerns in the course where I try to relief the students from the pressure of the grade and its consequences and make the student concentrate more on the learning process. Moreover, to improve the abilities and satisfy the interests of university-level science students, the student should take an active role in the teaching process. In order to stimulate the students' analytical thinking about the new concepts and principles of science I ask students conceptual questions during class and collect students' responses via Personal Response System PRS. I then allow students to discuss their answers with their peers to refine their knowledge. Next I recollect students' responses to see how much understanding students gain from their peers. After that I announce the right answer for the conceptual question and explain it along with other answers to show students why other answers are wrong.

The rapid development of computer science promotes the involvement of computer use in education. As a prospective physicist a student is to be computer educated so that he/she is prepared to face the challenges of science and technology. Involving applications of computer software in physics enables the student to practice theoretical simulations to solve many of the problems that he/she faces in some physics courses. Furthermore, the use of computers in physics courses motivates the student to learn and develop his/her own abilities and techniques to be well prepared to solve physical and technical problems at work place. In addition, the combination of computers and physics helps to open different opportunities in the student's career after graduation. Although the use of computers brings lots of benefits, understanding the concepts of physics should be the student's highest priority.

REFERENCES

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2. **Prof. Dr. Tariq Chaudhry**
   Head of Science Department,
   Prince Sultan Military College of Health Sciences,
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