

# Aqsa Arshad

## Lecturer and Research Group Lead

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**AREA OF EXPERTISE:** Nanotechnology: Nanostructured materials; Composite and doped materials; Graphene related materials; MXenes; 2D TMDs; Material analysis. Energy: Supercapacitors. Environment application: Wastewater treatment; Electromagnetic interference shielding. Biomedical application: Antibacterial materials; Hyperthermia. Techniques: Electrochemistry; Visible/UV light photocatalysts.

**PROFILE:** Lead Nanophysics Research Group @ IIU; Post-doctorate University of Cambridge, UK. I have **15** years of teaching and research experiences with outstanding track-record, including: **25** publications in prestigious and reliable international scientific journals, **10** international/national conference presentations and **7** invited talks, (h-index of **17**; **971** citation).

### PROFESSIONAL EXPERIENCE

DATE	POSTION	EMPLOYER
21/12/2010 - Present	<i>Lecturer</i>	International Islamic University, Islamabad, PK
09/10/2009 - 13/12/2010	<i>Lecturer</i>	University of Wah, Rawalpindi, PK
10/05/2010 - 10/10/2010	<i>Visiting Lecturer</i>	Department of Geophysics, Bahria University, Islamabad, PK

### EDUCATION

**Ph. D. Degree** in Physics, Department of Physics, Faculty of Basic and Applied Sciences, International Islamic University, Islamabad, Pakistan; Research @Durham University, Durham, UK

### PUBLICATIONS

#### Refereed Journal Publications

Published 25 papers in best scientific, multi-disciplinary Journals such as: *Applied Surface Science*; *Nanoscale*; *Nanotechnology*; *Results in Engineering*; *Surfaces and Interfaces* (**h-index of 17**; **971 citations**).

#### Publications:

1. Liaquat. M., **Arshad. A.**, Arshad. A. M., Zulqurnain. M., Tertiary nanocomposites of polyaniline/graphene/Ta<sub>2</sub>C MXene: High-performance free standing EMI shields, **(2025)**, 106680 *Surfaces and Interfaces* (**IF: 6.3**)
2. Liaquat. M., **Arshad. A.**, Tahir. A. F., Shoaib. N., Rehman. S., Polyaniline/Ta<sub>2</sub>C MXene nanocomposites for electromagnetic noise reduction, **(2025)** *Results in Engineering*, 25, 103542 (**IF: 7.9**)
3. **Arshad. A.**, Siddique, S., Shahid, Zulqurnain. M., Niazi. R. K., Mansoor, Q., Nadeem. K., Bi-functional Ni doped La<sub>2</sub>O<sub>3</sub> nanosheets: their enhanced photocatalytic performance and antibacterial properties, **(2022)** *Journal of Physics D: Applied Physics*, 55, 304007 (**IF: 3.2**)
4. Rehman, S. U., Niazi, R. K., Zulqurnain, M., Mansoor, Q., Iqbal, J., **Arshad, A.**, Graphene nanoplatelets/CeO<sub>2</sub> nanotiles nanocomposites as effective antibacterial material for multiple drug-resistant bacteria, **(2022)**, *Applied Nanoscience*, 12, 1779–1790 (**IF: 3.869**)
5. **Arshad, A.**, Nisar, T. Q., Zulqurnain, M., Niazi, R. K., Mansoor, Q., SnO<sub>2</sub> nanorods/graphene nanoplatelets nanocomposites: towards fast removal of malachite green and pathogen control, **(2021)**, *Nanotechnology*, 33, 115101 (**IF: 2.9**)
6. Israr, M., Iqbal. J., **Arshad, A.**, Sadaf, A., Rani, M., Rani, M., Jabeen, S., CuFe<sub>2</sub>O<sub>4</sub>/GNPs nanocomposites for symmetric supercapacitors and photocatalytic applications, **(2021)**, *Journal of Physics D: Applied Physics*, 54, 395501(**IF: 3.2**)
7. Talat, I., **Arshad, A.**, Mansoor, Q., Graphene nanoplatelets/Cr<sub>2</sub>O<sub>3</sub> nanocomposites as novel nanoantibiotics: Towards control of multiple drug resistant bacteria, **(2021)**, *Ceramics International*, 47, 889-898 (**IF: 5.6**)
8. Israr, M., Iqbal. J., **Arshad, A.**, Rani, M., Gómez-Romero, P., Benages, R., Graphene triggered enhancement in visible-light active photocatalysis as well as in energy storage capacity of (CFO)<sub>1-x</sub>(GNPs)<sub>x</sub> nanocomposites, **(2020)**, *Ceramics International*, 46, 2630 2639 (**IF: 5.6**)
9. Jabeen, S., Iqbal. J., **Arshad, A.**, Awan, M. S., Warsi M. F, (In<sub>1-x</sub>Fe<sub>x</sub>)<sub>2</sub>O<sub>3</sub> nanostructures for photocatalytic degradation of various dyes, **(2020)**, *Materials Chemistry and Physics*, 243, 122516 (**IF: 4.7**)
10. Israr, M., Iqbal. J., **Arshad, A.**, Aisida, S. O., Ahmad, I., A unique ZnFe<sub>2</sub>O<sub>4</sub>/graphene nanoplatelets nanocomposite for electrochemical energy storage and efficient visible light driven catalysis for the degradation of organic noxious in wastewater, **(2020)**, *Journal of Physics and Chemistry of Solids*, 140, 109333 (**IF: 4.9**)

11. Israr, M., Iqbal, J., **Arshad, A.**, Rani, M., Gómez-Romero, P., Sheet-on-sheet like calcium ferrite and graphene nanoplatelets nanocomposite: A multifunctional nanocomposite for high-performance supercapacitor and visible light driven photocatalysis, (2020), *Journal of Solid State Chemistry*, 121646 (**IF: 3.5**)
12. Israr, M., Iqbal, J., **Arshad, A.**, Rani, M., Gómez-Romero, P., Benages, R., Multifunctional MgFe<sub>2</sub>O<sub>4</sub>/GNPs nanocomposite: Graphene-promoted visible light driven photocatalytic activity and electrochemical performance of MgFe<sub>2</sub>O<sub>4</sub> nanoparticles, (2020), *Solid State Sciences*, 110, 106363 (**IF: 3.3**)
13. Jabeen, S., Iqbal, J., **Arshad, A.**, Samarin, S., Willim, J., Rani, M., Heterojunction formation in In<sub>2</sub>O<sub>3</sub>-NiO nanocomposites: Towards high specific capacitance, (2020), *Journal of Alloys and Compounds*, 842, 155840 (**IF: 6.3**)
14. Noreen, H., Iqbal, J., **Arshad, A.**, Faryal, R., Rahman, A., Khattak R., Sunlight induced catalytic degradation of bromophenol blue and antibacterial performance of graphene nanoplatelets/polypyrrole nanocomposites, (2019), *Journal of Solid State Chemistry*, 275, 141 (**IF: 3.5**)
15. **Arshad, A.**, Iqbal, J., Mansoor, Q., Graphene/Fe<sub>3</sub>O<sub>4</sub> nanocomposite: solar light driven Fenton like reaction for decontamination of water and inhibition of bacterial growth, (2019), *Applied Surface Science*, 474, 57 (**IF: 6.9**)
16. **Arshad, A.**, Iqbal, J., Mansoor, Q., Ahmad, I., Graphene/Fe<sub>3</sub>O<sub>4</sub> nanocomposite: interplay between photo Fenton type reaction and carbon purity for the removal of methyl orange, (2018), *Ceramics International*, 44, 2643 (**IF: 5.6**).
17. **Arshad, A.**, Iqbal, J., Alam, A., Bibi, K., Faryal, R., Synthesis, characterization and enhanced dielectric and antimicrobial properties of W<sub>x</sub>Cu<sub>1-x</sub>O nanostructures, (2018), *Ceramics International*, 44 (6), 5894-5900 (**IF: 5.6**)
18. **Arshad, A.**, Iqbal, J., Mansoor, Q., NiO-nanoflakes grafted graphene: an excellent photocatalyst and a novel nanomaterial for achieving complete pathogen control, (2017), *Nanoscale*, 9, 16321 (**IF: 5.1**)
19. **Arshad, A.**, Iqbal, J., Mansoor, Q., Ahmad, I., Graphene/SiO<sub>2</sub> nanocomposite: the enhancement of the photocatalytic and biomedical activity of SiO<sub>2</sub> nanoparticles by graphene, (2017), *Journal of Applied Physics*, 121(24), 244901 (**IF: 2.7**)
20. **Arshad, A.**, Iqbal, J., Siddiq, M., Ali, M. U., Ali, A., Shabbir, H., Nazeer, U, B., Saleem, M, S., Solar light triggered catalytic performance of graphene-CuO nanocomposite for waste water treatment, (2017), *Ceramics International*, 43(14), 10654 (**IF: 5.6**)
21. **Arshad, A.**, Iqbal, J., Siddiq, M., Mansoor, Q., Ismail, M., Mehmood, F., Ajmal, M., Abid, Z., Graphene nanoplatelets induced tailoring in photocatalytic activity and antibacterial characteristics of MgO/graphene nanoplatelets nanocomposites, (2017), *Journal of Applied Physics*, 121(2), 024901 (**IF: 2.7**)
22. Mehmood, F., Iqbal, J., Jan, T., Ahmed, W., Ahmed, W., **Arshad, A.**, Mansoor, Q., Ilyas, S. Z., Ismail, M., Ahmed, I., Effect of Sn doping on structural, optical, electrical, and anticancer properties of WO<sub>3</sub> nanoplates, (2016), *Ceramics International*, 42(13), 14334–1434. (**IF: 5.6**)
23. Iqbal, J., Jan, T., Shafiq, M., **Arshad, A.**, Ahmad, N., Badshah, S., Yu, R. Synthesis as well as Raman and optical properties of Cu-doped ZnO nanorods prepared at low temperature, (2014), *Ceramics International*, 40(1), 2091-2095 (**IF: 5.6**)
24. Iqbal, J., Jan, T., Ismail, M., Ahmad, N., Arif, A., Khan, **Arshad, A.**, Influence of Mg doping level on morphology, optical, electrical properties and antibacterial activity of ZnO nanostructures, (2014), *Ceramics International*, 40(5), 7487-7493 (**IF: 5.6**)
25. Jan, T., Iqbal, J., Ismail, M., Badshah, N., Mansoor, Q., Arshad, A., Ahkam, Q. M. Synthesis, physical properties and antibacterial activity of metal oxides nanostructures, (2014), *Materials Science in Semiconductor Processing*, 21, 154-160 (**IF: 4.6**)

### **Invited Talks**

*Total of 7 invited talks at national and international forums*

1. 10<sup>th</sup> Global Conference on Materials Science and Engineering (CMSE 2021), August 1-4, 2021, hybrid/online conference held in Kyiv, Ukraine.
2. 2<sup>nd</sup> Edition of Webinar on Nanotechnology, (Nano 2021), March 23-24, 2021, <https://nano.endeavorresearchgroup.com/scientific-program.php>; Organized by: Endeavor Research Pvt. Limited
3. 4<sup>th</sup> National Symposium on Laser Matter Interaction (LMI), Virtual Conference, September 21-22, 2020, National Center for Physics (NCP), Islamabad, PK.
4. 16<sup>th</sup> International Symposium on Advanced Materials, October 21-25, 2019, National Centre for Physics, Islamabad, PK.
5. European Graphene Forum, April 2017, Paris, France.
6. Advance Energy Materials, September 11-13, 2017, at University of Surrey, Guildford, United Kingdom
7. The 2<sup>nd</sup> Conference on Materials and Processes 2015 (CEMP 2015), December 22-23, 2015, at School of Chemical and Materials Engineering (SCME) NUST, Islamabad, PK

### **Poster Presentations**

1. International Workshop on Advanced and In Situ Microscopies of Functional Nanomaterials and Devices, October 27-31, 2019, The Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany
2. ISESCO, Women in Science Conference 2016, March 08, 2016, at Quaid i Azam University, Islamabad, PK
3. The 3rd ASEAN-Pakistan Conference on Materials Science (APCoMS-3) November 25-27, 2014, at School of Chemical and Materials Engineering (SCME), NUST, Islamabad, PK

#### **Participation**

1. Liquid Metal Batteries, November 16-17, 2022, Issac Newton Institute for Mathematical Sciences, University of Cambridge, Cambridgeshire, UK
2. Energy and Light 2022-Cambridge Cluster Tool Symposium, October 27, 2022, Maxwell Centre, University of Cambridge, Cambridgeshire, UK
3. Heroes of the Energy Transition: Zero Carbon Electricity, Electrification & Energy Efficiency, October 19, 2022, Dr Jan Rosenow, Maxwell Centre, University of Cambridge, Cambridgeshire, UK
4. The Milkyway Galaxy-From Beginning to End, Professor Gerry Gilmore, October 10, 2022, Department of Chemistry, University of Cambridge, Cambridgeshire, UK
5. Workshop on Electrochemical Energy Storage: Theory, Experiments, and Applications, May 05-26, 2022, ICTP, Italy (online)
6. Light-Rechargeable Batteries: A New Tool to Fight Climate Change? Professor Michael De Volder, March 14, 2022, Babbage Lecture Theatre, University of Cambridge, Cambridgeshire, UK
7. Royce/Bruker Nano Surfaces and Metrology AFM Training Workshop, March 10-11, 2022, Maxwell Centre, University of Cambridge, Cambridgeshire, UK
8. Nano Comes to Life, March 04, 2022, Sonia Contera, Wolfson Lecture Theatre, Department of Chemistry, University of Cambridge, Cambridgeshire, UK
9. X-ray Photoelectron Spectroscopy (XPS) Training Event, January 18-20, 2022, Online Training, Organised by University of Manchester, Manchester, UK
10. NECEM Workshop on Interfaces in Thin-Film Photovoltaics, March 29-30, 2021, Online Workshop Organized by Newcastle University, Newcastle, UK
11. World Nano Congress on Advanced Science and Technology, WNCST 2021, Online Conference, March 8-13, 2021
12. Nano Comes to Life, Webinar, February 11, 2021, Department of Physics, University of Oxford, Oxford, UK
13. 2D MXenes 2020: Ten years later, Virtual Conference, August 03-07, 2020, Drexel University, Philadelphia, PA, USA
14. Promoting Applied Sciences in Pakistan, PASP-2020, e-Conference, July 20-21, 2020, The University of Cambridge, Cambridgeshire, UK and NUST, PK
15. Workshop on Energy Storage Systems: Science, Technology, and Innovation, December 06, 2018, International Islamic University, Islamabad, PK
16. Building Brains, March 01, 2017, at Department of Physics, Durham University, Durham, UK
17. National Workshop on X-ray Photoelectron Spectroscopy, May 02-03, 2016, at National Centre for Physics, Islamabad, PK
18. National Workshop on Ion Beam Applications, June 02-03, 2016, at National Centre for Physics, Islamabad, PK
19. Regional Conference on Women in Physics, April 25, 2016, at National Centre for Physics, Islamabad, PK
20. Intellectual Property Rights and Their Registration Systems in Pakistan, May 17, 2016, at International Islamic University, Islamabad, PK
21. Workshop on Contemporary Topics in Nano-Magnetism, February 23-26, 2015, at National Centre for Physics, Islamabad, PK
22. First CIIT International Spring School on Computational Materials, May 21-29, 2015, at CIIT Islamabad, PK
23. A Day with Women Physicists of Pakistan, April 21, 2014, at National Centre of Physics, Islamabad, PK

#### **PRIZES AND AWARDS**

1. Best Research Paper Award 2017; 7<sup>th</sup> HEC Outstanding Research Awards, Awarded by Higher Education Commission, PK
2. IRSIP Scholarship (Higher Education Commission), (Durham University, Durham, UK) for PhD Research
3. Research Honoraria for Publications from International Islamic University, Islamabad, PK
4. American Physical Society (APS), USA Travel Grants
5. HEC travel grants for international conferences
6. World Federation of Scientists Fellowship (Geneve, Switzerland) for Research at Quaid I Azam University, PK
7. Pakistan Science Foundation Fellowship for M. Phil Physics Research at Quaid I Azam University, PK
8. Best Student Prize, Federal College of Education, H-9, PK

#### **TEACHING, SUPERVISING AND MENTORING ACTIVITIES**

15 years teaching experience (MSc and BS Physics), supervision and mentoring of MSc, M. Phil and PhD students (~10 MSc, 12 MS and 2 enrolled PhD students)

#### **PROFESSIONAL ACTIVITIES**

- International Islamic University (PK) – Research Events Organizer (2018- 2019)
- Member of Graduate Research Committee
- Secretary; Board of Studies (Physics) IIU
- Focal Person Student Co-Curricular Activities IIU
- Focal Person (Physics) @ QEC IIU (2011-2014)

#### **VOLUNTEER ACTIVITIES**

- The NSPCC, UK (Fundraising for child protection in the UK)
- Aghosh (Girl Children); Al-Khidmat Foundation (PK)