Dr. FAUZIA IQBAL
Associate Professor
Department of Physics, University of the Punjab, Lahore, Pakistan
E-mail: fauziaiqbal.physics@pu.edu.pk
ORCID: Fauzia Iqbal (0009-0005-8127-7021) - ORCID

RESEARCH INTERERSTS:

Additive manufacturing (DLP-based 3D printing) of ceramic, polymer, and composite materials for biomedical applications (bone scaffolds, bioinks, intra-oral radiotherapy stents), energy storage (battery solid electrolytes), and optoelectronics (white LEDs, phosphor-in-glass systems).

EXPERIENCE:

1. **October 2019 to date**

   Department of Physics, University of the Punjab, Lahore, Pakistan
   Position: **Assistant Professor**

2. **January 2019 to October 2019**

   Department of Physics, University of the Punjab, Lahore, Pakistan
   Position**: Assistant Professor (IPFP)**

3. **April 2017 to March 2018**

   Engineering Ceramics Department, Korea Institute of Material science, South Korea.
   Position: **Post Doc. Researcher**

   Research Focus: 3D Printing of ceramic materials (Alumina, Zirconia and hydroxyapatite) using tape casting method with Digital light processing (DLP).

4. **September 2009 to February 2013**

   Punjab Group of Colleges, Lahore, Pakistan
   Position**: Lecturer**

5. **June 2008 to June 2009**

   Department of Physics, University of the Punjab, Lahore, Pakistan
   Position: **HEC Internee** under “support to scientific talent” program

ACADEMIC QUALIFICATIONS

- **Ph.D.** Materials Science and Engineering (2017), Department of Materials Science and Engineering, Inha University, South Korea
- **Research Focus**: Evaluation of reliability and degradation of Phosphor-in-Glass (PiG) Encapsulants for High-Power white LEDs
- **M. Phil.** Solid State Physics **(**2009), Centre of Excellence in Solid State Physics, University of the Punjab, Lahore, Pakistan
- **Research Focus**: Carbon nanostructures, thermal chemical vapour deposition (CVD).
- **B.Sc. (Hons.)** Physics (2007), Department of Physics, University of the Punjab, Lahore, Pakistan

RESEARCH PROJECTS:

- **Project:** "**Development of Slurries for 3D Printing of Ceramic/Polymer Scaffolds for Bone Tissue Engineering**" HEC-NRPU-2020, awarded by HEC **(14 million PKR-3 years: Feb. 2021-Feb. 2024)**- working as **Principal Investigator**-completed
- **Project:** "**Solar-Light-Driven Simultaneous Hydrogen Generation and Water Purification by Synergetic Adsorption and Photocatalysis**", awarded by PSF-NSFC (Pakistan Science Foundation) (**13.5 million PKR-3 Year**)**-** working as **Participant**. (2022-2025).
- **Project:** "**Stereo lithography based 3D printing of piezoelectric bioactive glass with interconnected pores for bone regeneration application**" 2022-2023, University of the Punjab, Lahore. **0.2 Million PKR-1 Year. Principal Investigator**-completed
- **Project:** "**Optimization of sintering parameters of 3D printed bone scaffolds**" 2021-2022, University of the Punjab, Lahore. **0.5 Million-1 Year. Principal Investigator**-completed
- "**3D printing of inorganic sulfide basedsolid electrolyte via DLP for Li-ion batteries**", 2024-2025, University of the Punjab, Lahore. **0.2 Million-1 Year. Principal Investigator**-completed
- ***"*Customizable 3D Printed nanoparticle loaded photo curable Hydrogels for Wastewater Treatment*", 2025-2026,*** University of the Punjab, Lahore. **0.3 Million-1 Year. Principal Investigator**

STUDENTS SUPERVISED:

1. Yasir Usman **(Ph.D.)**, First Supervisor, (2020-2026), Additive Manufacturing of Bioactive Glass Ceramic Scaffolds for bone Tissue Engineering, in progress
2. Aleena Munawar (**Ph.D.**), First Supervisor, (2020-2026),3D Printed Lead-Free Piezoelectric Scaffolds for Bone Tissue Engineering, in progress
3. Aqsa Hameed (**Ph.D.**), First Supervisor, (2022-2028), 3D printing of inorganic solid-state electrolyte for Li- ion batteries via DLP, in progress
4. Sanam Abbasi **(Ph.D.)** First Supervisor, (2025-2031)

- ***Supervised 9 M.Phil. students*** *to completion and currently supervising* ***5 M.Phil. students***

SCHOLARSHIP, AWARDS AND RESEARCH ACTIVITIES:

- "**Fully funded Jungseok International Scholarship for Ph.D**."- awarded by Inha University, South Korea.
- "**Support to scientific talent**" - awarded by Higher Education Commission (HEC), Pakistan. (June 2008-June 2009)
- **Merit certificate:** 3rd position at college level in F.Sc.
- **Merit certificate:** 2nd position in M.Phil. Solid state Physics
- **Merit certificate:** 3rd highest percentage in BS. Physics
- **Chief Organizer and Conference Secretary:** "**PU international symposium on advanced energy storage materials (PU-AESM-2019)**", Department of Physics, University of the Punjab (4-6 Nov, 2019)
- **Advisory member and Conference Secretary:** First "**International conference on Advances in Functional Materials**" 20-22 Feb. 2023 (Department of Physics, PU Lahore)
- **Focal Person and Advisory member:** Organized Conference under Project: "**International Conference on 3D Printed and Energy Conversion Materials**, 25^{th}-26^{th} January 2024**"** (Department of Physics, PU Lahore)

PUBLICATIONS:

1. M. Akmal, S. Iqbal, S.W. Kim, D.Y. Jeong, **Fauzia Iqbal***, A. Iqbal and Z.H. Farooqi, 2025. UV-Photopolymerized P (AM)/PVA IPN Hydrogels with Tunable Mechanical and Biological Performance for Tissue Engineering. *Materials Today Communications*, p.114543. https://doi.org/10.1016/j.mtcomm.2025.114543
2. M. Shakoor, G. Ali, K.T., Kubra, A. Butt, **Fauzia Iqbal**, S. Zehra, & M. Nadeem, "Electrochemical investigations of Fe3O4/ZnO/carbon ternary composite derived from bimetallic metal-organic framework for supercapacitor applications." *Inorganic Chemistry Communications* (2025): 115586. https://doi.org/10.1016/j.inoche.2025.115586
3. N.Butt, K.T. Kubra, G. Ali, A. Butt, A. Shahid, U. Hayder, **Fauzia Iqbal**, and A. Salman, 2025. Electrochemical study of nanoneedle arrays of quaternary metal (Ni-Co-Cu-Ce)-based oxides composite hybridized with nitrogen-doped graphene oxide and polyaniline for supercapacitor applications. *Journal of Alloys and Compounds*, *1013* (2025), p.178549. https://doi.org/10.1016/j.jallcom.2025.178549
4. M. Akmal, H. Mehtab, R. Amjad, **Fauzia Iqbal***, A. Irfan, R. Begum, Z. H. Farooqi, UV-curable PVA based hydrogel systems: properties, applications and future directions, *Express polymer letters*, 17 (2024), 1109-1134. 10.3144/expresspolymlett.2024.85
5. D. Ali, A. Tufail, S. W. Kim, D.Y. Jeong, **Fauzia Iqbal***, & F. Rehman. Thermal, Surface, and Structure Analysis of Molybdenum substituted Bioactive Glass Ceramics SiO2-CaO-MoO3-P2O5. *Materials Chemistry and Physics*, 129749 (2024). https://doi.org/10.1016/j.matchemphys.2024.129749
6. Kim, Seung-Wook, Hwa-Pyeong Lee, Ji-Ung Ha, Jin-Sam Choi, **Fauzia Iqbal**, and Dae-Yong Jeong. "Weibull statistical analysis of fracture behavior and Vicker's hardness of yttria ceramics sintered at various temperatures." *Journal of the Korean Ceramic Society* 61 (2024), 1-9. https://doi.org/10.1007/s43207-024-00375-z
7. Shehzad H, Chen J, Shuang MT, Liu Z, Farooqi ZH, Sharif A, Ahmed E, Zhou L, Irfan A, Begum R, **Fauzia Iqbal**. Fabrication of an efficient hierarchical mesoporous 2D-MoS2/CNT/polypyrrole based composite electrodes for competitive and selective U6+ removal using capacitive deionization: mechanistic evaluation through cyclic voltammetry. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 2023 Oct 23:132637. https://doi.org/10.1016/j.colsurfa.2023.132637
8. Shahid A, Kubra KT, Ali G, Naz R, Butt A, **Fauzia Iqbal**, Salman A. A robust approach for designing a quaternary hybrid (NiMn2O4/NiWO4/NGO/PANI) as novel electrode material with enhanced stability for supercapacitor applications. *Electrochimica Acta*. 472 (2023), 143395. https://doi.org/10.1016/j.electacta.2023.143395
9. M. Khan, S. Iqbal, S. Musaddiq, **Fauzia Iqbal**, J. Kanwal, S. Ahmad," Polymer microgel-based gold nanocomposites for reductive degradation of azo dyes", *Desalination and Water Treatment*. 303 (2023), 224-235. https://doi.org/10.5004/dwt.2023.29782
10. A. Khan A, S.Iqbal, M. Khan, **Fauzia Iqbal**, S. Musaddiq, W. Masoom, A. Sarwar. A Comprehensive Review on Polymer Nanocomposites; Classification, Properties and Potential Applications. *JOURNAL OF NANOSCOPE (JN)*. 4 (2023), 45-74. https://doi.org/10.52700/jn.v4i1.88
11. M.U.Tariq, D. Bahnemann, F. Idrees, S. Iqbal, **Fauzia Iqbal**, F.K. Butt, J.R. Choi, M. Bilal. "Laser flash photolysis study of Nb2O5/g-C3N4 heterostructures as efficient photocatalyst for molecular H2 evolution". *Heliyon*. 9 (2023), e16772. https://doi.org/10.1016/j.heliyon.2023.e16772
12. B. Nawaz, G. Ali, M.O. Ullah, **Fauzia Iqbal**, F.J. Iftikhar, S. Mehboob, A.U. Rehman, and S. M. Abbas, "$Co_2Ge_4O_4$ nanocomposites with reduced graphene oxide and carbon nanotubes as high-performance anodes for Na-ion batteries", *RSC Advances*, *11*(21), 13004-13013 (2021). https://doi.org/10.1039/D1RA00780G
13. K.T. Kubra, A. Javaid, R. Sharif, G. Ali, **Fauzia Iqbal**, A. Salman, F. Shaheen, A. Butt, and F. J. Iftikhar, "Facile synthesis and electrochemical study of a ternary hybrid PANI/GNP/MnO2 as supercapacitor electrode

material", *Journal of Materials Science: Materials in Electronics*, 31(15), 12455-12466 (2020). https://doi.org/10.1007/s10854-020-03792-y

14. **Fauzia Iqbal**, S. Kim and H. Kim, "Degradation of phosphor-in-glass encapsulants with various phosphor types for high power LEDs," *Optical Materials*. 72, 323–329 (2017). https://doi.org/10.1016/j.optmat.2017.06.024
15. S. Kim, **Fauzia Iqbal** and H. Kim, "Relationship between phosphor properties and chromaticity of phosphor-in-glass," *Applied Optics*. 56(34), 9477–9483 (2017). https://doi.org/10.1364/AO.56.009477
16. **Fauzia Iqbal**, S. Kim, Y. Kim, H. Yie and H. Kim, "Effect of alkali metal oxides on reliability and degradation of phosphor-in-glass encapsulants for white LEDs," *Ceramics International*. 42, 10393–10398 (2016). https://doi.org/10.1016/j.ceramint.2016.03.177
17. Y. Kim, S. Kim, **Fauzia Iqbal**, H. Yie and H. Kim, "Effect Transmittance on Luminous Properties of Phosphor-in-Glass for LED Packaging," *Optics Express*. 23 [3], A43-50 (2014). https://doi.org/10.1364/OE.23.000A43
18. J. Seo, S. Kim, Y. Kim, **Fauzia Iqbal** and H. Kim, "Effect of glass refractive index on light extraction efficiency of Light-Emitting Diodes," *Journal of the American Ceramics Society*. 97 [9], 2789-2793 (2014). https://doi.org/10.1111/jace.13040
19. **Fauzia Iqbal**, S. Naseem, S. Riaz, A. Sadiqa, "A study of deposition, characterization and growth conditions of Carbon nanostructures on stainless steel (201)," *Nanoscience and Nanotechnology*. 34, 96-103 (2013). DOI: 10.5923/j.nn.20130304.03
20. A. A. Sadiqa, B. S. Naseem, **Fauzia Iqbal** "Fabrication possibilities of metal source/drain schottky FETs using wet chemical etching technique on p-type (100) Silicon," *Journal of Electron Devices*. 17, 1406-1411 (2013).

BOOK CHAPTERS:

1. A. Khan, S. Iqbal, S. Batool, S. Musaddiq, and **Fauzia Iqbal**. Understanding Photocatalytic Mechanism Through Spectroscopy Techniques. In *Graphene-Based Photocatalysts for Hydrogen Production and Environmental Remediation* (pp. 115-145) (2024). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-68464-7_5
2. F. Idrees, **Fauzia Iqbal**, S. Iqbal, A. S. Shah, and H. Joan. "Photoelectrochemical properties for metal oxide–carbon hybrid materials. In *Metal Oxide-Carbon Hybrid Materials*." (2021): 75-102. https://doi.org/10.1016/B978-0-12-822694-0.00009-0

FORMAL TRAININGS:

- **Course: British Council-Higher Education Commission, Capacity Building Course for Principal Investigators**. Lahore, Pakistan. 9-13 May 2022.
- **Faculty Orientation Program,** University of the Punjab, Lahore University of the Punjab, Lahore 6-10 November 2023.

CONFERENCES/SYMPOSIUMS/WORKSHOPS:

Invited Talks

1. Dr.Fauzia Iqbal **(Invited speaker),** "5th Annual International Conference on Advances in Materials Science (AIMS-2024)", 27-28 November 2024, University of education, Lahore
2. Dr.Fauzia Iqbal **(Invited speaker)**, "The Potential and Future of SLA Based 3D Printed Ceramic-Polymer Composites for Bone Scaffolds", 3rd International Conference on Chemical and Allied Sciences for Sustainable Development (CASSD-2022)" organized by The Women University Multan. (28-30 November 2022)

3. Dr.Fauzia Iqbal **(Invited speaker)**, "Importance and Potential of Ceramic 3D Printing", 2nd International Physics Conference on "Emerging Trends in Material Science & Technology" organized by Department of Physics, Lahore Garrison University, Lahore. (April 5th-6th, 2021)
4. Dr.Fauzia Iqbal **(Invited speaker)**, "The Factors Affecting the Luminaire Reliability of Phosphor-in-Glass (PiG) Encapsulants for High Power Light Emitting Diodes (LED's)", 3rd International Conference on "Advances in theoretical & Applied Physics" organized by Department of Physics, Government College Women University Faisalabad. (February 24th - 26th, 2021)
5. Dr.Fauzia Iqbal **(Invited speaker)**, " Analysis of Thermal Aging and Humidity Effects on Phosphor-in-Glass (PiG) Encapsulants for High Power LEDs", 2nd Symposium on "Advanced Materials" organized by Department of Physics, Lahore Garrison University, Lahore. (February 28th - 29th, 2020)

Oral Presentations

1. **Fauzia Iqbal** and Hyungsun Kim, Reliability of phosphor in glass encapsulants with various phosphors in glass matrix for white LEDs, Yosu, The Material Research Society of Korea (18-20 May 2016), (**Oral presentation**)
2. **Fauzia Iqbal** and Hyungsun Kim, Reliability of phosphor in glass encapsulants for white LEDs, Nagaoka, JK Ceramics32, Japan (18-21Nov.2015), (**Oral presentation**)
3. **Fauzia Iqbal** and Hyungsun Kim, Degradation of phosphor in glass encapsulants with different alkali metal oxides for white LEDs, Jeju, IUMRS-ICAM2015 (25-29 Oct. 2015), (**poster presentation**)
4. **Fauzia Iqbal**, Sunil, Kim, Hoyong Yie and Hyungsun Kim, Effect of alkali metal oxides on reliability of phosphor in glass encapsulants for white LEDs, Gumi, The Material Research Society of Korea (14-15 May 2015), (**Oral presentation**)
5. **Fauzia Iqbal**, Sunil Kim, Yurian Kim and Hyungsun Kim, Effect of humidity on transmittance and porosity of glass used as encapsulants for white LEDs, Changwon, The Material Research Society of Korea (14-16 May 2014), (**Poster presentation**)
6. Workshop on Application of Nano Technology (WANT-2010) organized by National Centre for Physics and Quaid-i-Azam University, Islamabad, (31st May-4th June, 2010), **(Poster presentation)**
7. National Research Conference organized by University of South Asia, Lahore (29-30th June, 2007), **(Oral Presentation)**

Participated

1. One day Symposium on '**Emerging Trends and Opportunities in Biomedical Engineering'**, 10 Apr 2025 (Biomedical Engineering Department, UET, Lahore, New Campus, Pakistan).
2. '**KIST Pakistan Alumni Research Symposium (KPARS-23)**', 30-31 Oct 2023 (National University of Science & Technology, Islamabad, Pakistan).
3. **7th Asian Science Editors' Conference and Workshop 2022 Malaysia**. Held virtually on July 12, 2022
4. **'International Nathiagali Summer College on Physics and Contemporary Needs',** 2nd -7th July 2012. Organized by National Centre for Physics (NCP), Islamabad

ORGANIZED:

1. **Focal Person and Advisory member:** Organized Conference under Project: "**International Conference on 3D Printed and Energy Conversion Materials**, 25th-26th January 2024**"** (Department of Physics, PU Lahore)
2. **Advisory member and Conference Secretary:** First "**International conference on Advances in Functional Materials**" 20-22 Feb. 2023 (Department of Physics, PU Lahore)
3. **Chief Organizer and Conference Secretary:** "**PU international symposium on advanced energy storage**

materials (PU-AESM-2019)", Department of Physics, University of the Punjab (4-6 Nov, 2019)

4. **Member Organizing Committee: "One day workshop on Lasers and Technology**", Department of Physics, University of engineering & Technology, Lahore, 14th June 2012

TOPIC COORDINATOR

- Special issue on Polymeric and Composite Materials" in Frontiers in Materials, Frontiers Online, Frontiers Impact Factor Journal, 2023

JOURNAL REVIEWER

1. Journal of the Korean Ceramic Society (JKCS), International, Since 2023 (springer Link)
2. ECS Journal of Solid State Science and Technology (IOP Publishing)

COMPUTER SKILLS:

Programing languages (C and C^{++}), MATLAB, Origin, Imaging analyzing software, characterization analyzing software

INSTRUMENTATION EXPERTISE

DLP 3D printer, SEM-EDX, XRD, PSA, Hot stage Microscopy, TG-DTA, DSC, FTIR, Integrating Sphere, Photoluminescence Spectrometer

SERVICE ACTIVITIES:

1. Member, Departmental Advisory Committee (Department of Physics) (Since June 2021)
2. Member, Quality Enhancement Cell QEC (Physics) (Since Feb. 2021)
3. Member/Secretary: Punjab University Physics Association (Since Oct. 2023)
4. Member Scholarship Committee (Since Jan. 2021)
5. Member: Departmental Career Counselling & Alumni Cell (Since jan. 2025)
6. Member Departmental Technical Evaluation Committee (Since March 2025)
7. Coordinator, Time Table (Nov. 2019-Dec. 2024)
8. Member, Co, Curricular Activities Committee (March 2023-Dec. 2024)
9. Member five-year plan preparation (2023)
10. In-charge Electrode Fabrication and Additive Manufacturing Lab (Since Jan. 2022)
11. Assistance, Modern Physics Lab (Jan. 2022-Dec. 2024)
12. In charge, Research Publications, Media/ Social media (Since 2022)

COURSES TAUGHT & INSTRUCTIONAL EXPERIENCE:

- Surface Analysis Techniques by electron emission (Ph.D.), PU
- 3D Printing and Additive Manufacturing, Project Course (Ph.D.), PU
- Topics in Electrodynamics (MS.), PU
- Classical Electrodynamics-I (BS, M.Sc.), PU
- Classical Electrodynamics-II (BS, M.Sc.), PU
- Computational Physics-I (BS, M.Sc.), PU
- Computational Physics-II (BS, M.Sc.), PU
- Mechanics (BS), PU
- Quantitative reasoning (BS), PU

- Electricity and Magnetism (BS), PU
- Undergraduate Physics Lab I, II, III, IV, PU

COURSES DEVELOPED:

- 3D Printing and Additive Manufacturing (Ph.D. and M.Phil. level), Department of Physics,PU

EXTERNAL THESIS EVALUATION:

- I have evaluated five MPhil thesis and eleven BS thesis in Pakistan during my service as an Assistant Professor.

MEMBERSHIP:

- Council of Asian Science Editors (CASE)
- Member external affairs committee at CASE

INTERNATIONAL VISITS:

1. South Korea: Feb 2013-May 2018. As **Ph.D. Scholar and Post Doc. Researcher**
2. Japan: 18-21Nov.2015: **Attended a conference**
3. South Korea: 23rd June 2023- 20th August 2023. As **Visiting Scholar**

REFERENCES:

1. Prof. Hyungsun Kim (Ph.D. Supervisor)
   Department of Material Science and Engineering
   Inha University, South Korea
   kimhs@inha.ac.kr

2. Prof. Daeyong Jeong (Research Collaborator)
   Department of Material Science and Engineering
   Inha University, South Korea
   dyjeong@inha.ac.kr