

FARYAL IDREES ASSISTANT PROFESSOR DEPARTMENT OF PHYSICS UNIVERISTY OF THE PUNJAB LAHORE, PAKISTAN

RESEARCH INTERESTS

Energy Related materials: Nb₂O₅, VO₂, Carbon-based materials Supercapacitors (Symmetric and Asymmetric) Li ion batteries Zinc-Ion Batteries Photocatalyst Hydrogen storage Solar Water-Splitting and Hydrogen Production Electrochemistry Laser Photolysis

VITALS

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RESEARCH GATE

https://www.researchgate.net/profile/Faryal-Idrees?ev=hdr_xprf&_sg=_twJsGKHrll78HC2EHeVhHV8HFrDrbpbOqr9kCxz SE1aBCCHq80iUcDuY6J8Bv9HnuRuFn0_78lf7l boyWDt6U7

ADSCIENTFIC INDEX

https://www.adscientificindex.com/scientist.p hp?id=363649

ORCID

https://orcid.org/0000-0002-4254-4554

GOOGLE SCHOLAR Dr. Faryal Idrees - Google Scholar

BRIEF PROFILE

- Published 62 SCI papers, and 05 Book Chapters, in impact factor journals.
- o Total impact factor of more than 340.
- Citations > 6569, h-index 33, i-10 index 49.
- Working on and worked on 4 highly funded projects.
- o Research work presented at several international conferences.
- o Total of 5 academic awards.
- O 2 PhD and 19 M.Phil research students are supervised and graduated, and O3 PhDs and O4 MPhil students are conducting their research.
- Collaborator of Research and Development Team of SunRay Green Tech Company.
- Associate Editor in Homogeneous Catalysis, (specialty section of Frontiers in Catalysis), Frontiers.

EXPERIENCE

ASSISTANT PROFESSOR

[2019-TILL DATE] Department of Physics University of the Punjab, Lahore **POST-DOCTORAL AWARDED BY ALEXANDER VON HUMBOLDT, GERMANY** [2017-2019] Institut für Technische Chemie Leibniz Universität Hannover **ASSISTANT PROFESSOR** [2015-2019]

Department of Physics, The University of Lahore, 1-Km Raiwind Road, Lahore, Pakistan.

EDUCATION

PHD IN MATERIALS PHYSICS AND CHEMISTRY

[2011-2015] School of Material Sciences and Engineering Beijing Institute of Technology

M.PHIL IN HIGH ENERGY PHYSICS

[2009-2011] Centre for High Energy Physics University of the Punjab, Lahore. Grade: A+ CGPA: 4.0 out of 4.0 Position: 4th **B.SC (HONS.) IN COMPUTATIONAL PHYSICS**

B.SC (HONS.) IN COMPUTATIONAL PHYSICS

[2005-2009] *Centre for High Energy Physics* University of the Punjab, Lahore. Grade: A

REFERENCES

- Prof. Detlef Bahnemann (Post-Doctoral Host) <u>bahnemann@iftc.uni-</u> <u>hannover.de</u>
- Prof. Mahmood ul Hassan (Chairman) chairman.physics@pu.edu.pk
- Prof. Cao Chuanbao (Ph.D Supervisor)
 cbcao@bit.edu.cn
- Dr. Nasir Mahmood (Ex-Colleague) <u>nasir.mahmood</u>
- o <u>@rmit.edu.au</u>

SKILLS

- Good Communication and Interpersonal Skill.
- Enjoy challenging tasks.
- Independent research project design and conduction.
- XRD, SEM, UV, PL, FTIR, TEM analysis, GC-MS Analysis, Electrochemistry.

COMPUTER SKILLS

- o Latex
- Mathematica (5 & 6)
- o C # , C++
- o Origin 8
- X'Pert High Score

MEMBERSHIP

Community Associate of ACS Chemistry for Life, 09/08/2023 to date. CGPA: 3.91 out of 4.0 Position: 4th

AWARDS AND ACTIVITIES

- Pakistan Higher Education Commission (HEC)-Approved Supervisor
- International Organizer of International Conference on Recent Advances in Physics, 7-9th April, 2018, Department of Physics, The University of Lahore
- Conference Secretary of International Conference on Materials Science and Nano Technology, 25th September 2016, Department of Physics, The University of Lahore
- Excellent student Award awarded by Beijing Institute of Technology for 2013-2014.
- Outstanding student Award awarded by Beijing Institute of Technology for 2013-2014.
- Outstanding student Award awarded by Beijing Institute of Technology for 2012-2013.
- During Bachelors obtained "HEC-Outstanding Students Scholarship by President" 2005-2008.
- o University Merit Scholarship several times.
- o 4th position holder in BSc(Hons) among all sessions.
- o 4th position holder in MPhil and secure 4.0/4.0 CGPA.
- http://phys.org/news/2015-03-silk-green-material-nextgeneration-batteries.html
- o <u>http://www.sciencedaily.com/releases/2015/03/150311124431.ht</u> <u>m</u>
- <u>https://www.acs.org/content/acs/en/pressroom/presspacs/2015/</u> acs-presspac-march-11-2015/silk-could-be-new-green-materialfor-next-generation-batteries.html

CONFERENCES/SEMINARS/WORKSHOPS

ORGANIZED

- International Organizer of International Conference on Recent Advances in Physics, 7-9th April 2018, Department of Physics, The University of Lahore.
- Conference Secretary of International Conference on Materials Science and Nano Technology, 25th September 2016, Department of Physics, The University of Lahore.
- Working as a Mentor of WEmpower Pakistan group for young scientist, where she has presented her work several times.
- Member of National Advisory Board of "First International Conference on Advances in Functional Materials" February 20-22, 2023.

EDITORIAL

- Guest editor of special issue on:
 "Progression in Photocatalytic Materials for Efficient Performance" for Catalysts Journal impact factor 4.146.
- Guest editor of special issue on: "New Trends in Photocatalytic Materials for Efficient Performance" for Catalysts Journal impact factor 4.146.
- Guest editor of Special Issue on "WEmpower Materials Science Research on SDGs" for Materials Innovation.
- Guest editor of Special Issue on "Recent Advances in Functional Materials: Polymers and Composite Materials" for Frontiers in Materials, impact factor 3.985.
- Associate Editor in Homogeneous Catalysis, (specialty section of Frontiers in Catalysis). Frontiers.

NATIONAL PROJECTS/GRANTS

- "Development of Materials Synthesis Lab", The University of Lahore, March 2016, Approved and successfully running.
- Development of Photocatalysis Lab under PSF-NSFC project.
- Design and Construction of Photocatalytic Materials for H₂ Generation, URG-PU-2021-2022.
- Hydrothermal Synthesis of Niobium-based Nanostructures for Photocatalytic Applications, URG-PU-2022-2023.
- Co₃O₄-g-C₃N₄ Heterostructures Synthesis and Optimization for Biosensing and Photocatalytic Applications, URG-PU-2024-2025.

- Chief Organizer of "First International Conference on Advances in Functional Materials" February 20-22, 2023.
- Conference Secretary of "3D Printed and Energy Conversion Materials", January 25-26, 2024.

ATTENDED

- 5th International Conference on Advances in Material Science (AIMS 2024) organized by University of Education, Lahore, 5-26-27th November 2024, Invited Speaker.
- International Conference on Emerging Trends in Physics, 8-9
 October (ICETP-2024), Participated as a Keynote Speaker.
- 2nd International Conference on Trends in Material Sciences and Nanotechnology (ICTMSN)" organized by Forman Christian College and Chartered University on 29 Feb-01 March 2024 as Invited Speaker.
- KIST Pakistan Alumni Research Symposium, Organized by NUST on 30-31 October 2023, Attended.
- "Synthesis and Characterizations of MoS₂/Wo₃ Heterostructures for Efficient Photocatalytic Efficiency", Virtual Speaker Presentation in International Conference on Catalysis and Chemical Engineering, March 20-21, 2023, Belstay Roma Aurelia, Rome, Italy, Organized By: SciSynopsis LLC Atlanta, GA 30326, USA.
- 5th International Conference on Advances in Material Science (AIMS 2023) organized by University of Education, Lahore, 5-29-30th November 2023, Invited Speaker.
- 3rd International Conference on Advances in Materials Science (AIMS-2022) organized by University of Education, Lahore, 15-16 December 2022, Invited Speaker.
- "An improved photocatalytic activity of H₂ production: A hydrothermal synthesis of TiO₂ nanostructures in aqueous triethanolamine," 2nd International Conference on Advances in Material Science (AIMS 2021) organized by University of Education, Lahore, 5-6 October 2021, Invited Speaker.
- "Nb₂O₅/g-C₃N₄ Heterostructures as Highly Efficient Photocatalysts for Molecular H₂ Evolution under Solar Illumination", 2nd International Physics Conference on Emerging Trends in Material Science & Technology, (Lahore Garrison University), 05-06 Apr 2021, Invited Speaker.
- "Photocatalysis: Development of Semiconductor Photocatalysts for Energy Conversion Application", 3rd International Conference on Advances in Theoretical and Applied Physics, (Government College Woman University, Faisalabad), 24-26 Feb 2021, Invited Speaker.
- \circ "Development of Heterostructures Photocatalytic Application to Nb_2O_5/g-C_3N_4 Heterostructures as Efficient

INTERNATIONAL RESEARCH PROJECTS

- PSF-NSFC Joint Research Proposal entitled, "Solar-Light-Driven Simultaneous Hydrogen Generation and Water Purification by Synergetic Adsorption and Photocatalysis", Working as Principal Investigator, Current Status: In Progress.
- PSF-NSFC Joint Research Proposal entitled, "Design and Construction of Photocatalytic Materials for Efficient Hydrogen Generation", Worked as Co-PI, Current Status: Completed.
- PSF-NSFC Joint Research Proposal entitled, "Developing a coupled strategy for synthesis of highly efficient photocatalysts for overall water splitting to produce hydrogen fuel", Working as Co-PI, Current Status: Just Accepted, 2024.
- "Facile Template and Free 0 Synthesis of Niobium Based Semiconductors: Applications for Energy Storage and Photocatalysis", National Natural Science Foundation of China, Research Fund for the Doctoral Program of Higher Education of China, September 2013-July 2015, successfully executed and developed a photocatalysis lab.
- "Microwave-Assisted Synthesis of Niobium based Nanostructures for Hydrogen Production as a Renewable Energy Resource", by Alexander-von-Humboldt-Stiftung, successfully executed.

Photocatalyst,"1st International Conference on Advances in Material Science (AIMS 2020), organized by University of Education, Lahore, 23rd-24th July 2020, Oral Presentation.

- Presented paper in "The 10th Postgraduate Forum, School of Materials Science and Engineering", BIT, May 28, 2013, the paper published in proceedings.
- Presented paper in BOND21-Joint International Conference on Nanoscience, Engineering, and Management, Malaysia, 19-21 August 2013, the paper published in proceedings.
- Participated in THE 9th ALL PAKISTAN MOBILINK GIKI SCIENCE FAIR held on 22-24 February 2008
- Participated in SOFTEC '08 held at FAST-NU, Lahore Campus on 30-31 August 2008.
- o International Scientific Spring 2011, March 01-04, 2011.

PUBLICATIONS

- Shahid W, Idrees F*, Zou JJ, Choi JR, Pan L. (2024 Dec 27), "Solar Light-Driven Efficient Degradation of Organic Pollutants Mediated by S-Scheme MoS₂@TiO₂-Layered Structures." <u>Nanomaterials</u>, IF=4.4,15(1):28. <u>https://doi.org/10.3390/nano15010028</u>
- 2. BOOK CHAPTER: Durre Sameen, Saqib Ahmad, Faryal Idrees*, <u>"Optimal</u> Photodeposition of Co-Catalyst Over 2D Heterostructures for Improved H2 Production/Water-Splitting", IntechOpen. 2024.
- 3. Gan L, Zhang X, Guo L, Ajmal M, Jia R, Guo X, Shi C, Pan L, Idrees F, Zhang X, Huang ZF. (2024), "Redirecting surface reconstruction of CoP-Cu heterojunction to promote ammonia synthesis at industrial-level current density." <u>Chemical Engineering Journal</u>, IF=13.3, 487:150429. <u>https://doi.org/10.1016/j.cej.2024.150429</u>
- 4. Javed, A., Idrees, F., JEONG, D., Bahnemann, D.W. and Cao, C., (2024), "Recent Advances in Functional Materials: Polymers and Composite Materials." Frontiers in Materials, 11, p.1426738. <u>https://doi.org/10.3389/fmats.2024.1426738</u>
- 5. Z Xiao, L Yuan, M Ai, F Idrees, ZF Huang, C Shi, X Zhang, L Pan, JJ Zou, (2024),
 "Z-Scheme Charge Transfer between Conjugated Polymer and α-Fe₂O₃ for Simultaneous Photocatalytic H₂ Evolution and Ofloxacin Degradation", Journal of Materials Chemistry A, RSC., 12 (9), 5366-5376. https://doi.org/10.1039/D3TA072176
- M Ai, Z Peng, X Li, F Idrees, X Zhang, JJ Zou, L Pan, (2024), "Piezoelectricenhanced n-TiO₂/BaTiO₃/p-TiO₂ heterojunction for highly efficient photoelectrocatalysis", <u>Green Energy & Environment, Elsevier.</u>, 9 (9), 1466-1476.

https://doi.org/10.1016/j.gee.2023.12.001

7. Mariam Afzal, Faheem K. Butt, Yahya Sandali, Syed Shahbaz Ali, Faryal Idrees, Sadia Zafar Bajwa, Durre Sameen, Mohsan Waseem Ather, Muhammad Danish Khan, Anwaar Ahmad, Danish Rehman, (2024), "Novel copper vanadium oxide/g-C₃N₄ nano-composites for optoelectronic and biosensing properties", <u>Ceramics International</u>, ISSN 0272-8842, 50 (8), 13750-13760.

https://doi.org/10.1016/j.ceramint.2024.01.289.

REVIEWER

- Facile synthesis of porous g-C₃N₄ with enhanced visible-light photoactivity, Molecules (ISSN 1420-3049), 02 December, 2021.
- One Pot Synthesis of Chlorophyll-Assisted Exfoliated MoS₂/WS₂ Heterostructures via Liquid Phase Exfoliation Method for Photocatalytic Hydrogen Production, Nanomaterials (ISSN 2079-4991), 09-10-2021.
- Ternary Rh-TiO₂-CeO₂ Hybrid Photocatalysts for Efficient Photocatalytic Hydrogen Production, Nanomaterials (ISSN 2079-4991), 2021-05-25.
- Bioremoval of toxic malachite green from water through simultaneous decolorization and degradation using laccase immobilized biochar, Chemosphere
- Photocatalytic Decomposition of N₂O by Using Nanostructured Graphitic Carbon Nitride/Zinc Oxide Photocatalysts Immobilized on Foam, Catalysts, 20-08-2019.
- Surface-Doped Graphitic Carbon Nitride Sensitize Photooxidation of Olefins and Dienes: Chemical Evidence for Singlet Oxygen and Electron Transfer Mechanism, Catalysts, 13-07-2019.
- Cubic Germanium monochalcogenides (pi-GeS and pi-GeSe): Emerging materials for optoelectronic and energy harvesting devices, Solar Energy, 25-01-2019.
- TiO₂ Co-doped with Zr and Ag shows highly efficient visible light photocatalytic behavior suitable for treatment of polluted water, RSC Advances, 11-07-2020.
- Ternary Hybrid Ag/SnO₂-X/Bi₄O₅I₂ photocatalysts: impressive efficiency for photocatalytic degradation of antibiotics and inactivation of bacteria, Applied Surface Science, Elsevier.
- Heterogeneous compositions of oxygencontaining functional groups on biochars and their different roles in rhodamine B degradation, Chemosphere, Elsevier
- CdS with tunable crystalline phase structures: controllable preparation and enhanced photocatalytic properties, Research on Chemical Intermediates, Springer Nature 21-08-2023

 Muhammad Umair Tariq, Detlef Bahnemann, Faryal Idrees*, Saman Iqbal, Fauzia Iqbal, Faheem K Butt, Jeong Ryeol Choi, Muhammad Bilal, (2023/5/28). "Laser flash photolysis study of Nb₂O₅/g-C₃N₄ heterostructures as efficient photocatalyst for molecular H₂ evolution", <u>Heliyon, Elsevier</u>, 9 (6).

https://doi.org/10.1016/j.heliyon.2023.e16772

- Aleena Fatima, HM Naeem Ullah, Muhammad Rizwan, Sana Maqbool, Faryal Idrees, Zahid Usman (2023/6/1). "Theoretical description of structural, electronic, elastic, mechanical, and optical response of Ba_{1-x}Cd_xTiO₃ for optoelectronic applications", <u>Materials Today</u> <u>Communications</u>, Elsevier, 35, 105925. https://doi.org/10.1016/j.mtcomm.2023.105925
- Wajeehah Shahid, Faryal Idrees*, Muhammad Aamir Iqbal, Muhammad Umair Tariq, Samiah Shahid, Jeong Ryeol Choi*, (2022), "Ex Situ Synthesis and Characterizations of MoS₂/WO₃ Heterostructures for Efficient Photocatalytic Degradation of RhB." (2022/8/28), Nanomaterials, 12(17), 2974.

https://doi.org/10.3390/nano12172974

- 11. Farhan Sattar, Wajeehah Shahid, Abdul Waheed Anwar, Muhammad Aamir Iqbal, Maria Malik, Nadia Anwar, Faryal Idrees, Syed Zaheer Ud Din, Qudsia Kanwal (2022/2/1). "Synthesis and characterization of Zn doped AlSb thin films for photovoltaic and energy applications." Zeitschrift fürNaturforschung A, De Gruyter. https://doi.org/10.1515/zna-2021-0335
- 12. Wajeehah Shahid, Samiah Shahid, Muhammad Aamir Iqbal, Faryal Idrees, Syed Zaheer Ud Din, Atta Ullah Shah, Khan Alam, Qudsia Kanwal, Sadia Sagar Iqbal (2022/1/1). "Laser irradiation effects on structural, morphological and mechanical characteristics of iron". Zeitschrift für Naturforschung De Gruyter A, 77(1), 87-92. https://doi.org/10.1515/zna-2021-0208
- Saman Iqbal¹, Muhammad Shahid Rafique², Sultan Akhtar³, Nida Iqbal⁴, Faryal Idrees^{1,*}, Arshad Mahmood⁵, (2022), "Role of Hydrogen Flow Rate for the Growth of Quality Nanodiamonds via Microplasma Technique", 2 (8), 214-224, Materials Innovations. HEXA PUBLSHERS. <u>http://doi.org/10.54738/MI.2022.2804</u>
- 14. BOOK CHAPTER: Muhammad Aamir Iqbal, Maria Malik, Wajeehah Shahid, Syed Zaheer Ud Din, Nadia Anwar, Mujtaba Ikram, Faryal Idrees (2022/1/20). "Materials for Photovoltaics: Overview, Generations, Recent Advancements and Future Prospects". <u>IntechOpen</u>
- BOOK CHAPTER: Muhammad Aamir Iqbal, Naila Ashraf, Wajeehah Shahid, Deeba Afzal, Faryal Idrees, Raice Ahmad (2021/9/17). "Fundamentals of Density Functional Theory: Recent Developments, Challenges and Future Horizons." IntechOpen, DOI: 10.5772/intechopen.99019.
- **16.** BOOK CHAPTER: Faryal Idrees, Fauzia Iqbal, Saman Iqbal, Amir Shehzad Shah, Husnain Joan (2021). "Photoelectrochemical Properties for Metal Hybrid Materials Oxide-Carbon (2021)." <u>Elsevier</u> DOI: 0.21741/9781644901090.
- BOOK CHAPTER: Maria Malik, Muhammad Aamir Iqbal, Wajeehah Shahid, Syed Zaheer Ud Din, Mujtaba Ikram, Nadia Anwar, Samiah Shahid, Faryal Idrees. <u>"Overview of Liquid Crystal Research: Computational</u> <u>Advancements, Challenges, Future Prospects and Applications"</u>, IntechOpen. 2022.
- **18.** Idrees, F., F. K. Butt, S. B. Hammouda, (2021), **Progression in Photocatalytic** Materials for Efficient Performance, *Catalysts 11(4):169. 472.*

REVIEWER

- In-situ Sol-Gel Fabrication of Lanthanum-Doped Nickel Oxide Nanostructures for the Degradation of Rhodamine B, RSC Advances 17-01-2023
- Synthesis and characterization of Sm₂FeMnO₆ double perovskites nanoparticles supported on graphitic carbon nitride as photocatalyst for the degradation of organic dyes under simulated sunlight light, RSC Advances 10-11-2024
- Synthesis and Performance Evaluation of Zinc Oxide Tubes/Alginate Microfibre Composite for Photodegradation of Methylene Blue: A Novel Reporting Approach, RSC Advances 22-05-2024
- Narrow band gap 1D g-C₃N₄/3D-Bi₂ MoO₆ self-assembled heterojunction structure with enhanced photocatalytic performance for removal of MB or Cr(VI), Springer Nature 17-12-2024

REVIEWER NATIONAL PROJECTS

- The monolithic integration of flexible perovskite solar cells and supercapacitors PSF-NSFC/202307/339
- Design, Experimental and Simulation Investigation of Flexible and Thermally Conductive Phase Change Films for Improved Energy Yield of Solar Photovoltaic Module PSF-NSFC/202307/201
- HEC/NRPU PROJECT

- 19. Wajeehah Shahid, Samiah Shahid, Muhammad Aamir Iqbal, Jianhua Huo, Rashid Karim, Faryal Idrees (2021/11/1). "<u>An improved photocatalytic</u> <u>activity of H2 production: a hydrothermal synthesis of TiO₂ nanostructures</u> <u>in aqueous triethanolamine</u>". Zeitschrift für Naturforschung A De Gruyter, 76 (11), 1061-1066.
- 20. Zia Ur Rehman, Faheem K Butt, Narmina O Balayeva, Faryal Idrees, Jianhua Hou, Zeeshan Tariq, Sajid Ur Rehman, Bakhtiar Ul Haq, Salem Alfaify, Saif Ali, Sher Zaman, (2021/12/1). "Two dimensional graphitic carbon nitride Nanosheets as prospective material for photocatalytic degradation of nitrogen oxides." Diamond and Related Materials(Elsevier), 120,108650.
- Maryam Qasim, Jianhua Hou, M. A. Qadeer, Sajid Butt, M. Hassan Farooq, M. Qasim Farooq, Faryal Idrees, M. Tanveer, Jijun Zou, and Muhammad Tahir (2019). Nitrogen-Doped Carbon Nanosheets Decorated With Mn₂O₃ Nanoparticles for Excellent Oxygen Reduction Reaction, <u>Frontiers in</u> <u>Chemistry (</u>07):741.
- 22. J Hou, J Tang, K Feng, F Idrees, M Tahir, X Sun, X Wang (2019). "The chemical precipitatio0n synthesis of nanorose-shaped Bi₄O₅I₂ with highly visible light photocatalytic performance." <u>Materials Letters</u> 252, 106-109.
- **23.** T Jiang, J Jin, J Hou, M Tahir, F Idrees (2019). **Bi4Osl2/nitrogen-doped** hierarchical carbon (NHC) composites with tremella-like structure for high photocatalytic performance, <u>Chemosphere</u>, 229:426-433.
- 24. J Hou*, T Jiang, R Wei, F Idrees*, DW Bahnemann (2019). Ultrathin-layer structure of BiOI microspheres decorated on N-doped biochar with efficient photocatalytic activity, <u>Frontiers in Chemistry</u> 7: 378.
- Idrees, F., Dillert, R., Bahnemann, D., F. K. Butt, M. Tahir (2019). "In-Situ Synthesis of Nb₂O₅/g-C₃N₄ Heterostructures as Highly Efficient Photocatalysts for Molecular H2 Evolution under Solar Illumination." <u>Catalysts</u> 9(2):169.
- 26. Fayyaz Ahmad, Farwa Idrees, Fazal-e-Aleem and Faryal Idrees* Recent Advancements in Microwave-Assisted Synthesis of NiO Nanostructures and their Supercapacitor Properties: A Comprehensive Review, Current Nanomaterials, 2018, 3, (DOI:10.2174/2405461503666180305161202)
- Hou, J., K. Jiang, M. Tahir, X. Wu, F. Idrees, M. Shen and C. Cao (2017).
 "Tunable porous structure of carbon nanosheets derived from puffed rice for high energy density supercapacitors." <u>Journal of Power Sources</u> 371: 148-155.
- 28. Hou, J., K. Jiang, M. Shen, R. Wei, X. Wu, F. Idrees and C. Cao (2017). "Micro and nano hierarchical structures of BiOl/activated carbon for efficient visible-light-photocatalytic reactions." <u>Scientific reports</u> 7(1): 11665.
- 29. Tahir, M., L. Pan, F. Idrees, X. Zhang, L. Wang, J.-J. Zou and Z. L. Wang (2017). "Electrocatalytic oxygen evolution reaction for energy conversion and storage: A comprehensive review." <u>Nano Energy</u> 37: 136-157.
- 30. Idrees, F., J. Hou, C. Cao, F. K. Butt, I. Shakir, M. Tahir and F. Idrees (2016). "Template-free synthesis of highly ordered 3D-hollow hierarchical Nb₂O₅ superstructures as an asymmetric supercapacitor by using inorganic electrolyte." <u>Electrochimica Acta</u> 216: 332-338.
- Ali, Z., M. Tahir, C. Cao, A. Mahmood, N. Mahmood, F. K. Butt, M. Tanveer, I. Shakir, M. Rizwan and F. Idrees (2016). "Solid waste for energy storage material as electrode of supercapacitors." <u>Materials Letters</u> 181: 191-195.
- **32.** Hou, J., T. Cao, F. Idrees and C. Cao (2016). "A co-sol-emulsion-gel synthesis of tunable and uniform hollow carbon nanospheres with interconnected mesoporous shells." <u>Nanoscale</u> **8**(1): 451-457.

EXTERNAL VIVA VOCE

- SYNTHESIS, CHARACTERIZATION AND OPTICAL PROPERTIES OF TIN SULPHIDE NANOSTRUCTURES, MUHAMMAD BABAR, MS Physics, Session Fall 2018-2020, scheduled on 05-05-2021, Division of Science & Technology, University of Education, Township, Lahore
- Synthesis of Two Dimensional 0 Graphitic Carbon Nitride Nanostructures and their Photoluminescence Properties, JAWAD AHMAD JRAR, MS Physics, Session Fall 2018-2020, scheduled on 05-08-2021, Division of Science & Technology, University of Education, Township, Lahore
- Synthesis and characterization of Zirconium doped Nickel Sulphide by Faiza Amin (M.Phil)- -GCWUF, under supervision of Yusra Arooj, M.Phil, 2022.
- Gram Scale Synthesis and 0 Characterization of Nickel Vanadium Oxide-Carbon Nitride Composites, Sagar Iqbal MSF 2100264, under supervision of Faheem K Butt, Department of Physics, Division of Science And Technology, University of Education Lahore, 2023.
- Effect Of Activated Carbon On Zinc Vanadium Oxide And Their Biosensing Properties, Ms/Mr Javeria Qadir, Student ID: msf2202042, under supervision of Faheem K Butt, Department of Physics, Division of Science And Technology, University of Education Lahore, 2024.

- 33. Tahir, M., N. Mahmood, X. Zhang, T. Mahmood, F. K. Butt, I. Aslam, M. Tanveer, F. Idrees, S. Khalid and I. Shakir (2015). "Bifunctional catalysts of Co₃O₄@ GCN tubular nanostructured (TNS) hybrids for oxygen and hydrogen evolution reactions." <u>Nano Research 8</u>(11): 3725-3736.
- 34. Butt, F. K., F. Idrees, M. Tahir, C. Cao, R. Hussain, R. Ahmed and B. U. Haq (2015). "Fabrication of ZnV₂O₆ nanostructures: Their energy storage and PL properties." <u>Materials Letters</u> 155: 15-17.
- 35. Butt, F. K., C. Cao, F. Idrees, M. Tahir, R. Hussain, R. Ahmed and W. S. Khan (2015). "Novel Zn₂V₂O₇ hierarchical nanostructures: Optical and hydrogen storage properties." <u>international journal of hydrogen energy</u> 40(30): 9359-9364.
- 36. Tahir, M., N. Mahmood, J. Zhu, A. Mahmood, F. K. Butt, S. Rizwan, I. Aslam, M. Tanveer, F. Idrees and I. Shakir (2015). "One dimensional graphitic carbon nitrides as effective metal-free oxygen reduction catalysts." <u>Scientific reports</u> 5: 12389.
- 37. Idrees, F., C. Cao, R. Ahmed, F. K. Butt, S. Butt, M. Tahir, M. Tanveer, I. Aslam and Z. Ali (2015). "Novel nano-flowers of Nb₂O₅ by template free synthesis and enhanced photocatalytic response under visible light." <u>Science of Advanced Materials</u> 7(7): 1298-1303.
- 38. Hou, J., C. Cao, F. Idrees and X. Ma (2015). "Hierarchical porous nitrogendoped carbon nanosheets derived from silk for ultrahigh-capacity battery anodes and supercapacitors." <u>ACS nano</u> 9(3): 2556-2564.
- 39. Tanveer, M., C. Cao, I. Aslam, Z. Ali, F. Idrees, W. S. Khan, M. Tahir, S. Khalid, G. Nabi and A. Mahmood (2015). "Synthesis of CauS flowers exhibiting versatile photo-catalyst response." <u>New Journal of Chemistry</u> 39(2): 1459-1468.
- 40. Aslam, I., C. Cao, M. Tanveer, M. H. Farooq, W. S. Khan, M. Tahir, F. Idrees and S. Khalid (2015). "A novel Z-scheme WO₃/CdWO₄ photocatalyst with enhanced visible-light photocatalytic activity for the degradation of organic pollutants." <u>RSC Advances</u> 5(8): 6019-6026.
- Khalid, S., C. Cao, A. Ahmad, L. Wang, M. Tanveer, I. Aslam, M. Tahir, F. Idrees and Y. Zhu (2015). "Microwave assisted synthesis of mesoporous NiCo₂O₄ nanosheets as electrode material for advanced flexible supercapacitors." <u>Rsc Advances</u> 5(42): 33146-33154.
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EXTERNAL VIVA VOCE

- Effects of solvents on synthesis, characterization and biosensing on manganese vanadium oxide. Rafia Zafar, MPhil-OPS-10-F22, School of Physical Sciences, University of the Punjab, Lahore.
- MXENE BASED SCHOTTKY-JUNCTION FOR UNASSISTED PHOTOELECTROCHEMICAL WATER SPLITTING, Sohaib Khalid, 243980095, FCCU, Lahore.

COURSES TAUGHT

- Nanotechnology
 Nanoelectronics
- Solid State Physics-I
- o Introduction to Materials Science

and

- o Renewable Energy Resources
- Probability and Statistics
- o Linear Algebra
- Computer Science II
- o COMPUTATIONAL PHYSICS-I
- o Electronic Devices and Circuits
- Physics Lab-III
- Physics Lab-IV
- o Heat and Thermodynamics
- Solar Energy
- o Projects
- o Techiques in statistical physiscs

- **47.** Aslam, I., C. Cao, W. S. Khan, M. Tanveer, M. Abid, F. Idrees, R. Riasat, M. Tahir, F. K. Butt and Z. Ali (2014). "Synthesis of three-dimensional WO₃ octahedra: characterization, optical and efficient photocatalytic properties." <u>RSC Advances</u> **4**(71): 37914-37920.
- 48. Butt, F. K., C. Cao, T. Mahmood, F. Idrees, M. Tahir, W. S. Khan, Z. Ali, M. Rizwan, M. Tanveer and S. Hussain (2014). "Metal-catalyzed synthesis of ultralong tin dioxide nanobelts: Electrical and optical properties with oxygen vacancy-related orange emission." <u>Materials Science in Semiconductor Processing</u> 26: 388-394.
- **49.** Hou, J., C. Cao, X. Ma, F. Idrees, B. Xu, X. Hao and W. Lin (2014). **"From rice bran to high energy density supercapacitors: a new route to control porous structure of 3D carbon." <u>Scientific reports</u> 4**: 7260.
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- 53. Tahir, M., C. Cao, N. Mahmood, F. K. Butt, A. Mahmood, F. Idrees, S. Hussain, M. Tanveer, Z. Ali and I. Aslam (2014). "Multifunctional g-C₃N₄ nanofibers: a template-free fabrication and enhanced optical, electrochemical, and photocatalyst properties." <u>ACS applied materials & interfaces</u> 6(2): 1258-1265.
- 54. Butt, F. K., M. Tahir, C. Cao, F. Idrees, R. Ahmed, W. S. Khan, Z. Ali, N. Mahmood, M. Tanveer and A. Mahmood (2014). "Synthesis of novel ZnV₂O₄ hierarchical nanospheres and their applications as electrochemical supercapacitor and hydrogen storage material." <u>ACS applied materials & interfaces</u> 6(16): 13635-13641.
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- 59. Sajad Hussain Chuanbao Cao, W. S. K., Ghulam Nabi, Zahid Usman, Abdul Majid, Thamer Alharbi, Zulfiqar Ali, Faheem K Butt, Muhammad Tahir, MuhammadTanveer, Faryal Idress (2014). "Cu₂O/TiO₂ nanoporous thin-film heterojunctions: Fabrication and electrical characterization."

COURSES DEVELOPED

- RENEWABLE ENERGY RESOURCES, PH.D/M.PHIL, DEPARTMENT OF PHYSICS, UNIVERSITY OF LAHORE.
- ELECTROCHEMICAL ENERGY SYSTEMS, PHYS 5816, PH.D/M.PHIL, DEPARTMENT OF PHYSICS, UNIVERSITY OF THE PUNJAB, LAHORE

- Butt, F. K., C. Cao, W. S. Khan, M. Safdar, X. Fu, M. Tahir, F. Idrees, Z. Ali, G. Nabi and D. Yu (2013). "Electrical and optical properties of single zigzag SnO₂ nanobelts." <u>CrystEngComm</u> 15(11): 2106-2112.
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- **63.** Idrees, F., C. Cao, F. K. Butt, M. Tahir, M. Tanveer, I. Aslam, Z. Ali, T. Mahmood and J. Hou (2013). "Facile synthesis of novel Nb₃O₇F nanoflowers, their optical and photocatalytic properties." <u>CrystEngComm</u> **15**(40): 8146-8152.
- **64.** Tahir, M., C. Cao, F. K. Butt, F. Idrees, N. Mahmood, Z. Ali, I. Aslam, M. Tanveer, M. Rizwan and T. Mahmood (2013). "**Tubular graphitic-C₃N₄: a** prospective material for energy storage and green photocatalysis." Journal of Materials Chemistry A **1**(44): 13949-13955.
- 65. Mahmood, T., C. Cao, M. Tahir, F. Idrees, M. Ahmed, M. Tanveer, I. Aslam, Z. Usman, Z. Ali and S. Hussain (2013). "Electronic, elastic, acoustic and optical properties of cubic TiO₂: A DFT approach." <u>Physica B: Condensed Matter</u> 420: 74-80.
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- **67.** Butt, F. K., C. Cao, W. S. Khan, Z. Ali, R. Ahmed, F. Idrees, I. Aslam, M. Tanveer, J. Li and S. Zaman (2012). "Synthesis of highly pure single crystalline SnSe nanostructures by thermal evaporation and condensation route." <u>Materials Chemistry and Physics</u> **137**(2): 565-570.
- 68. Mahmood, T., C. Cao, F. K. Butt, H. Jin, Z. Usman, W. S. Khan, Z. Ali, M. Tahir, F. Idrees and M. Ahmed (2012). "Elastic, electronic and optical properties of cotunnite TiO₂ from first principles calculations." <u>Physica B:</u> <u>Condensed Matter</u> 407(22): 4495-4501.

RESEARCH STUDENTS

Sr No	Year	Thesis Title	Name	Supervisors		
		PhD				
01	29/07/2015-	Synthesis and characterization of Doped and	Mr. Muhammad			
	04/02/2019	Undoped Metal Oxide Multilayer Thin Films	Iftikhar	Dr. Faryal Idrees		
	Graduated			Dr. Khurshid Aslam		
02	DPH01171001	Chalcogenides-based heterostructures for	Ms. Wajeehah	Dr. Faryal Idrees		
	2022	photocatalytic applications	Shahid	Dr. Sadia Sagar		
	Graduated					
03	PhD-03F20	Hydrothermal Synthesis of Niobium-Based	Mr. Muhammad	Dr. Faryal Idrees		
	(Working)	Heterostructures for Photocatalytic	Saad Tanveer	Dr. Saman Iqbal		
		Applications				
		M.Phil				
01	15-09-2014	Template free microwave-assisted synthesis	Fayyaz Ahmad	Dr. Faryal Idrees		
	28-12-2016	of NiO with controlled morphology, growth		Ms Farwa Idrees		
	Graduated	habit and growth mechanism				

02	(2015-2017) Graduated	Emission of Ions from Laser Induced Plasma Using Faraday Cups and Fabrication of Faraday Cups	Tariq Hussain	Dr. Faryal Idrees Wajeehah Shahid
03	(2015-2017) Graduated	Detection of lons from Laser Induced Plasma Using Solid State Nuclear Track Detectors (CR- 39)	Zafar Iqbal	Dr. Faryal Idrees Wajeehah Shahid
04	(2016-2018) Graduated	ROLE of TITANIUM DIOXIDE NANOPARTICLES (TiO ₂ -NPs) to REMOVE CADMIUM (Cd) From WASTEWATER	Waseem Gill	Dr. Faryal Idrees Atif Arshad
05	PHP01173048 2017-2019 Graduated	Nanostructure Fabrication of Iron Oxide for Photocatalysis	Muhammad Qasim Farooq	Dr. Faryal Idrees Dr. Muhammad Tahir
06	PHP01181031 2017-2019 Graduated	Hydrothermal synthesis and Characterization of TiO ₂ nanostructures for Photocatalytic applications	Rashid Karim	Dr. Faryal Idrees Ms Wajeehah Shahid
07	PHP01183050 2018-2020 Graduated	Synthesis and Characterization of Cobalt and Molybdenum doped graphite Carbon Nitride	Imam Yar Baig	Dr.Faryal Idrees Dr.Usman Qadri
08	PHP01183057 2018-2020 Graduated	Synthesis and Characterization of Tungsten based nanostructures for advanced photocatalytic applications	Amir Shehzad	Dr.Faryal Idrees Ms Wajeehah Shahid
09	PHP01183046 2018-2020 Graduated	Synthesis and Characterization of Co doped Nb_2O_5 and Mo doped Nb_2O_5 nanostructures	Sidra Shaheen	Dr.Faryal Idrees Ms Wajeehah Shahid
10	PHP01183058 2018-2020 Graduated	Laser study of GCN/ Nb_2O_5	Muhammad Umair Tariq	Dr.Faryal Idrees Dr.Usman Qadri
11	PHP01183059 2018-2020 Graduated	Laser study of GCN	Muhammad Bilal	Dr.Faryal Idrees Dr.Usman Qadri
12	PHP01183017 2018-2020 Graduated	Synthesis and characterization of Nb ₂ O ₅ to enhanced Photocatalytic activity	Husnain Joan	Dr.Faryal Idrees Ms Wajeehah Shahid
13	2018-2020 Graduated	Molybdenum and Cobalt Doped TiO ₂ synthesis and characterization	Mirza Ammar Afzal Baig	Dr. Faryal Idrees Ms Wajeehah Shahid
14	PHP01183010 2018-2020 Graduated	In-Situ synthesis and characterization of WO ₃ /TiO ₂ heterostructures and TiO ₂ /WO ₃ heterostructures	Sidra Liaqat	Dr. Faryal Idrees Ms Wajeehah Shahid
15	M.Phil-13F21 2021-2023 Graduated	Theoretical description of structural, electronic, elastic, mechanical and optical response of Ba _{1-x} Cd _x TiO ₃ for optoelectronic applications	Aleena Fatima	Dr. Faryal Idrees Dr. Muhammad Rizwan
16	MS-26F22 2022-2024 Graduated	Nickel Manganese Cobalt Oxide (NMCO) and Nickel Manganese Oxide (NMO) Based Electrodes Studied for Energy Storage Applications	Shoaib Akram	Dr. Faryal Idrees
17	MPhil-OPS-11-F22	Development of Cu ₂ V ₄ O ₁₁ Cathodes as	Dure Sameen	Dr. Muhammad

Asymmetric Aqueous Zinc-ion Batteries

Rizwan

Dr. Faryal Idrees

2022-2024

Graduated

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18	MS-11F22	Electrochemical measurements of Cellulose	Aliya Yousaf	Dr. Saman Iqbal
	2022-2024	/Zirconia nanocomposite as a Battery		Dr. Faryal Idrees
	Graduated	Separator		
19	PHYS71F22S027 2022-2024 Graduated	Synthesis and Characterization of Ternary Metal Oxide Nanocomposites for Photocatalytic and Antibacterial Applications	Saqib Ahmad	Dr. Muhammad Zahid Ishaque Dr. Faryal Idrees