

Hafiz Tariq Masood, Ph.D.

Contact Information Department of Physics, University of Sahiwal, tariq@uosahiwal.edu.pk
Farid Town Road Sahiwal, Punjab, Pakistan.

Research Interests Photovoltaics, Semiconductor Physics, Thin film devices, Material Sciences.

Education **University of Science and Technology of China**, Hefei, China

Ph.D. Physics, 2017

- Thesis Topic: *Fabrication of High Efficient CdTe Thin Film Solar Cells With Different Back Contacts.*
- Advisor: Prof. Dr. Deliang Wang

University of Punjab, Lahore, Pakistan

M.S. Nanotechnology, August. 2014

- Thesis Topic: *Preparation, Purification and Characterization of Carbon Nano-tubes by Plasma Assisted Chemical Vapor Deposition Method.*

University of Punjab, Lahore, Pakistan

B.S. Physics, August 2011

Professional Experience

- **Assistant Professor (Head of the Department).**
Department of Physics, University of Sahiwal, Pakistan
- **Assistant Professor.**
Department of Physics, Riphah Institute for Computing and Applied Sciences (RICAS) Riphah International University, Lahore Campus
- **Post-Doctoral Fellowship.**
College of Optical Sciences and Engineering,
Zhejiang University, Hangzhou, China
Collaboration with School of Electrical Engineering, Royal Institute of Technology (KTH), Stockholm, Sweden (September 2017 to March 2018)

- **Research Scientist.**
Hefei National Laboratory for Physical Sciences at micro-scale,
University of science and technology of China, Anhui, China (2014-2017)
- **Research Scholar.** Centre for Excellence in Solid-State Physics, University of the Punjab, Lahore Pakistan (2011-2014).

Refereed Journal Publications

1. **Hafiz Tariq Masood**, K. Shen, Q. Li, D. Xiao, and D. Wang. 2017. "CdTe Thin Film Solar Cells Fabricated With CuO as a Buffer Layer in the Back Contact." [J]. IEEE Journal of Photovoltaics, 7 (4): 1124-1129. IF = 4.1
2. **Hafiz Tariq Masood**, Zahir Muhammad, M. Habib, D. M. Wang, and D. Wang. 2017. "Low- temperature ferromagnetic properties of CdS and CdTe thin films." [J]. Chinese Physics B, 26 (6): 067503-1-067503-6. IF = 2.11
3. **Hafiz Tariq Masood**, Shoaib Anwer, xin wang, Abbas Ali and D. Wang. 2017. "Carbon-nanofibers film as a back-contact Buffer layer in CdTe thin film solar cel [J]. Optik (doi.org/10.1016/j.ijleo.2020.165505). IF = 2.11
4. Shoaib Anwer, G. Bharath , Shahid Iqbal, Hongmei Qian, **Hafiz Tariq Masood**, Kin Liao , Wesley J. Cantwell, Jiatao Zhang, Lianxi zheng "Synthesis of Edge-site Selectively Deposited Au Nanocrystals on TiO₂ Nanosheets: An Efficient Heterogeneous Catalyst with Enhanced Visible-Light Photoactivity" Electrochimica Acta, (DOI EA18-1246). IF = 5.1
5. Shoaib Anwer, Ahmed Bin Ari, G. Bharath, Pei Cao, Shashikant P. Patole, Shaohong Luo, **Hafiz Tariq Masood**, Wesley J. Cantwell, Kin Liao, Qingwen Li, and Lianxi Zheng" Synthesis of Joint-Welded Carbon Nanotube Foam @ Ni(OH)₂ Nanosheet-Based Core–Shell 3D Architecture for Freestanding Flexible Electrode for Supercapacitor Applications" Adv. Mater Interfaces,(DOI: 10.1002/admi.201900670). IF = 5.1
6. Khalil Adnan, Xiang, Ting, Wu, Chuan, **Hafiz Tariq Masood**, et al. "Synthesis of layered Ni₉S₈/MoS₂ hetero-catalyst for Enhanced Hydrogen Evolution Reaction." Langmuir. 33 (21): 5148-5153. IF = 4.9
7. Irfan Ali, Zaka Ullah, **Hafiz Tariq Masood**, Imran Rehan, Adnan Khalil, Muhammad Habib Yasir Sohail, Muhammad Waseem "Annealing disintegrates Cu₂MoS₄ nanosheets into MoS₂ and Cu₂S nanoheterostructures." Journal of Materials Science: Materials in Electronics. (DOI 10.1007/s10854- 017-7490-5) IF = 2.8

8. Muhammad Habib, Zahir Muhammad, **Dr. Hafiz Tariq masood**, Weiyu Xu, Hengjie Liu, Wei Gan, Chuan Qiang and Song, Li” WX2 (X=S, Se) Single Crystals: A Highly Stable Material for Supercapacitor Applications.”*Electrochimica Acta*. (DOI-EO17-27982) IF=5.11
9. Tariq Munair, **Hafiz Tariq Masood**, et all” <p>Quantitative analysis of glucose by using (PVP and MA) capped silver nanoparticles for biosensing applications</p>” [J]. *Physica B: Physics of Condensed Matter*. (DOI PHYSB_412564) IF = 1.90.
10. Muhammad Asif Nawaz*, Salman Ahmed, Yousra, Manzoor Saltan, Sarmad M. Shaheen, Muhammad Imran, Muhammad Rafique, **Tariq Masood** and Adeel Ahmed* Investigation of structural, optical and thermodynamic properties of FrBO_3 (B = Ta, Nb) perovskites: first principles-calculations, *Zeitschrift fur Medizinische Physik*
11. Muhammad Azhar-ul-Haq, Tariq Javed, Muhammad Amin Abid, **Hafiz Tariq Masood** & Nafeesa Muslim “Adsorptive removal of hazardous crystal violet dye onto banana peel powder: equilibrium, kinetic and thermodynamic-studies” *Journal of Dispersion Science and Technology*
12. Syed Awais Rouf, Muhammad Iqbal Hussain, Umair Mumtaz . Abdul Mannan Majeed, **Hafiz Tariq Masood** “A density functional theory study of the structural, electronic, and optical properties of XGaO_3 (X = V, Nb) perovskites for optoelectronic-applications” *Journal of Computational Electronics*
13. Muhammad Habib, Zahir Muhammad, Yasir A Haleem , Adnan Khalil, Sami Ullah, Fozia Shaheen , **Hafiz Tariq Masood** , Hamza Naeem , Nadeem Abbas, Rashid-Khan “Comparative analysis of the CVT grown layered transition metal dichalcogenides for supercapacitor application “ *ISSN*
14. Syed Awais Rouf , , Muhammad Iqbal Hussain , Umair Mumtaz, **Hafiz Tariq Masood** , Hind Albalawi , Abdul Mannan Majeed , R M Arif Khalil and Q Mahmood “An ab-initio study of electronic and optical properties of RhXO_3 (X = Ga, Ag) perovskites” *Physica scripta*
15. Muhammad Mubeen Parvaiz, Adnan Khalil, Muhammad Bilal Tahir, ab Sania Ayub Tarik E. Alic and **Hafiz Tariq Masood** “A DFT investigation on structural, electronic, magnetic, optical, elastic and hydrogen storage properties of Ru-based hydride-perovskites XRuH_3 (X = Cr, V, Ni)”, *Journal of Computational Electronics*

16. Tariq Javeda,*, Anusha Thumma , Abdullah Nur Uddinc, Rubbai Akhtera, Muhammad Babar Tajd, Shagufta Zafare, Mirza Mahmood Baigf , Syed Shoaib Ahmad Shahg, Muhammad Wasimh, Muhammad Amin Abida, **Tariq Masood** , Muhammad Idrees Jilani and Maryam Batoos “Batch adsorption study of Congo Red dye using unmodified Azadirachta indica leaves: isotherms and kinetics” Water practice and technology
17. Muhammad Asim Shahzad, **Hafiz Tariq Masood**, Muhammad Farooq Warsi, Zaheer Abbas Gilani, Abdullah Saad Alsubaie, Khaled H. Mahmoud, Salah M. El-Bahy, Zeinhom M. El-Bahy, Muhammad Azhar Khan & Muhammad Asghar “Impact of Nd³⁺ and Ni²⁺ dopants on the structural, electrical and dielectric behaviour of PbZrO₃ nanocrystalline material” Journal of Taibah University for Science
18. **Hafiz Tariq Masooda**, Shoaib Anwer, Syed Awais Rouf , Asif Nawaz, Tariq Javed , Tariq Munirf , Lianxi Zheng, Wang Deliang “Back contact buffer layer of WO₃ nanosheets in thin-film CdTe solar cell” Journal of Alloys and Compounds
19. Ilyas Muneera , Tariq Javeda, Aysha Abdul Majeed , **Hafiz Tariq Masood** “A brief study of adsorption of Congo red dye over sawdust of Cedrus-deodara.Desalination-and-Water-Treatment

Awards

- Chinese Government Scholarship (2014)
- Best oral presentation in 3rd International conference at Hefei National Laboratory of Physical Sciences, USTC Anhui China (2016).
- 2nd best Poster presentation in 17th China Photovoltaics conference, School of physics, Inner Mongolia University (2017)

International Meetings

- 2nd International Conference at Hefei National Laboratory of Physical Sciences, USTC Anhui China (2017)
- 3rd International CdTe workshop at Hohhot, China (2017).
- 10th International Photovoltaics Exhibition in Pudong district Shanghai, China (2016)
- 17th China Photovoltaics Conference, School of physics, Inner Mongolia University (2017)
- International Conference in the recent advancement in Physics, University of the Lahore, Pakistan. (2018).
- Presentation in Lahore University of Management Sciences (LUMS) (2018).

Teaching Experience

- Riphah International University, Pakistan.
- University of Sahiwal, Pakistan.
- University of the Lahore, Pakistan.
- Physics Teacher. Education Department Pakistan.
- Physics Lecturer (Visiting). Superior Group of Colleges. Pakistan
- Physics Lecturer(Visiting). The Punjab Science Academy. Pakistan
- Teaching Assistant Solid state Physics in University of Science and Technology of China.
- Teaching Assistant in Zhejinag University Hangzhou, Hangzhou, China.

Subject Taught

- Experimental Techniques in Physics.
- Solid State Physics.
- Semiconductor Physics.
- Advance Electronics.
- Modern Physics & Electronics.
- Advance Electrodynamics.
- Plasma Physics.
- Electricity and Magnetism.
- Wave & Oscillations.
- Material Science
- Heat & Thermodynamics.

Administrative Experience in University of Sahiwal

- Head of Physics Department, University of Sahiwal.
- In-charge University Guest House.
- Convener of Selection Committee (BS 1-16).
- Member of Campus Construction Committee.
- Deputy Resident Officer (RO)
- Deputy Director Academics Affairs
- Secretary of Harassment Committee
- Member of Semester Rules & regulation Committee
- Sectary/Member of Disciplinary Committee.

Research
Students
from Riphah
International
University

1. Muhammad Aslam.
2. Muddassir Kiyani
3. Abu bakar Siddique
4. Farkhanda Tahira.
5. Muhammad Ashraf.
6. Abbas Ali.
7. Muhammad Shafiq.
8. Haseeb- ul- Hassan.
9. Iqra Hafeez.
10. Tahreem Amber.
11. Hira Ch.
12. Arsalan Ahmad Rafi.
13. Muhammad Ehtasham
14. Rashid Ali
15. Arham Tanveer
16. Akbar Ali
17. Abid Shahzad
18. Neelam Ch.
19. Mahnoor Ali
20. Sidra Ali
21. Mateen Nawaz
22. Asim Murtaza

Scientific
Research
Experience

High efficient CdTe thin film solar cell.

- Designed equipment for CdS heat treatment in controlled atmosphere
- Optimized close-spaced sublimation parameters to fabricate high-quality CdTe film with through-thickness grains
- Controlled the CdS/CdTe interface diffusion by changing the CdS surface composition and morphology Fabricated back contacts with transition metal oxides (CuO) as buffer layer
- Successfully improved devices efficiency and prepared CdTe thin-film solar cells with the efficiency of 14.17 %

Experimental Fabrication.
Experience

- Mask Aligner
- DC And RF Sputtering
- Thermal Evaporator
- Thermal Annealing Furnace

- Coating Unit.
- Close- Spaced Sublimation
- MBE
- Chemical Bath Deposition.
- E-Gun System.

Semiconductor films and devices characterization.

- Hall measurement
- Ellipsometer
- Step profiler
- J-V
- C-V measurement
- Electrochemical analyzer
- Ultraviolet-visible reflection and transmission

Characterization.

- Scanning Tunneling Electron Microscope (SEM).
- Atomic Electron Microscope (AFM).
- Electron Microscope
- Vibrating Sample Magnetometer (VSM)
- XRD .
- Raman Spectrometry
- X-rays photoelectron spectroscopy.
- Solar simulator
- Kelvin probe force microscope

Language

- English
- Urdu/Hindi/Punjabi
- Chinese

Interests

- Reading News Paper
- Playing Football
- Playing Badminton

References

Prof. Dr. Deliang Wang
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 University of Science and Technology of China, China.
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Prof. Dr. Xinguo Ren.
 Key Laboratory of Quantum Information,
 University of Science and Technology of China, China.
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University of Science and Technology of China, China.

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Dr. Ghulam Murtaza.

Assistant Professor at Centre for Advanced studies in Physics,
GC University, Lahore Pakistan.

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Conferences,
Exhibitions
and Seminars

- International conference at Hefei National Laboratory of Physical Sciences at the micro-scale, USTC Anhui china
- 17th China Photovoltaics conference, School of physics, Inner Mongolia University
- 3rd International CdTe workshop at Hohhot (2017)
- 10th International Photovoltaics Exhibition in Pudong district Shanghai, China.
- 14th International conference on "Laser" National synchrotron Radiation Laboratory USTC Anhui, China.
- 5th Annual conference on "Advance materials" Hefei National Laboratory of physical sciences, USTC Anhui, China.
- Attended Lecture Series on "Graphene" at LUMS, organized by Khwarizmi Science Society.
- Attended a Lecture Series on "Nuclear Radiations", organized by PNRA at physics department, University of the Punjab.
- Attended a Seminar on "Cosmic Rays" at Physics Department, University of the Punjab.
- Attended a Seminar on "Nuclear Reactions and Their Harnessing Powers" at Physics department, University of Punjab.
- Attended a Symposium on "Laser" at Biotechnology Department, University of Punjab.
- Attended a lecture on "Super Fluidity in Helium" by Dr Douglas Osherof (Noble Laureate).
- Presented a lecture on "Maxwell Equations" at Physics Department, University of Punjab.
- Presented a lecture on "Radioactivity" at Physics Department, University of Punjab.
- Presented a lecture on "Semiconductor Materials" at Physics Department, University of Punjab.
- Presented a lecture on "Electron spin Resonance" at Physics Department, University of Punjab.
- Presented a lecture on "Does God Play Dice" at Physics Department,

University of Punjab.

- Presented a lecture on "Plasma Physics" at Physics Department, University of Punjab.
- Presented a lecture on "X-Ray Diffraction Techniques" at Physics Department, University of Punjab.
- Presented a lecture on "Antiferromagnetic materials" at Physics Department, University of the Punjab.