Dr. Babar Shahzad Khan

Associate Professor (Physics)
GC Women University Sialkot, Pakistan
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Education

2015-2016 **Postdoctoral Researcher** in the project: Fundamental Research on Nanocarbon-oxide High-temperature Composites,
State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology, Wuhan, China

2012-2015 **Doctor of Philosophy** in Physics with emphasis in Template-directed electrodeposition of Nanowires and their Characterizations,
Central China Normal University Wuhan, Hubei, P.R. China

2008-2010 **Master of Philosophy** in Physics, A Computer Simulation technique (Molecular Dynamics), used to study the defects and their interaction at higher temperatures,
Hazara University (HU) Dhodial Mansehra (KPK), Pakistan

2005-2007 **Master of Science** in Physics
Hazara University (HU) Dhodial Mansehra (KPK), Pakistan.

2003-2005 **Bachelor of Science** in Physics and Mathematics
Hazara University (HU) Dhodial Mansehra (KPK), Pakistan.

Experiences

Associate Professor: GC Women University Sialkot from 21st March, **2023** to Present

Director Purchase and Store: GC Women University Sialkot from 25th August, **2023** to 25th Feb **2024.**

Assistant Professor: GC Women University Sialkot from 18th Jan, **2016** to 20th March, **2023**

Lecturer: i. Army Public School and College System, 2nd Aug, 2010 to 28th Aug, 2012.

Research Interest and Expertise

- **Synthesis** of nanomaterials (metals, metal oxides, alloys) by different techniques including Electrochemical Deposition, Green Synthesis, Hydrothermal, and Co-Precipitation methods**.**
- **Characterization:** XRD, SEM/FE-SEM, FTIR, Cyclic Voltammetry (CV), Raman Spectroscopy, UC-Vis. Spectroscopy etc.
- **Computer simulation performance** by **Materials Studio** using Density Functional Theory (DFT) code ***CASTEP***
- **Applications:** Photocatalytic Activities, Magneto-dielectric Properties, and Antimicrobial Activities.
- Elaborate the **Formation Mechanism** of nanostructures.
- Analysis of the possible **Future Trends** of nanomaterials.

Honors and Awards

- **Cultural Exchange Scholarship** from Government of Pakistan (PhD program) for 2012-2015.
- **Outstanding Academic Achievement Award** for the year 2013-2014, from Central China Normal University, Wuhan.
- Achieved an **Excellent PhD Scholar Award** for the year 2014-2015 from Central China Normal University, Wuhan

Workshops and Trainings

1. **National Training Workshop on Nanomaterials** at National Institute for Biotechnology and Genetic Engineering (November 7-9, 2016)
2. **International Training Workshop on Materials Modeling and Simulation** at Allama Iqbal Open University (December 9-11, 2016)
3. **Workshop on Access to Technology for Innovation** organized by World Intellectual Property Organization (WIPO) at Higher Education Commission (Jan 31 to Feb 02, 2017)
4. **Orientation Program for Newly Established ORIC Personnel** at Centre for Innovation and Entrepreneurship, NUST (03-04 May, 2017)

5. **Workshop on Entrepreneurship and Professional Grooming** at GC Women University Sialkot (November 14-18, 2016)
6. **Faculty Development Program** at GC Women University Sialkot (January 23, 2017)
7. **Organize, One Day National Symposium on Modern Trends in Physics** at GC Women University Sialkot (May 11, 2017)
8. **Use of Turnitin Software and Digital Library** at GC Women University Sialkot (July 22, 2016)
9. **Use of Statistical Packages** at GC Women University Sialkot (June 3, 2016)
10. **One Day Hands-on Training for Available e-Resources** at GC Women University Sialkot (April 24, 2017)
11. **One Day Training on Mendeley, Endnote and Matex** under joint aspect of ITSC, HEC and GC Women University Sialkot (March 6, 2018)

Publications

1. Ayub, Maida, Mahwish Bashir, Farzana Majid, Rabia Shahid, **Babar Shahzad Khan**, Adnan Saeed, Mohammed Rafi Shaik, Mufsir Kuniyil, Baji Shaik, and Mujeeb Khan. "Eggshell-Mediated Hematite Nanoparticles: Synthesis and Their Biomedical, Mineralization, and Biodegradation Applications." *Crystals* 13, no. 12 (2023): 1699. **IF 2.7**
2. Ramzan, Iqra, Mahwish Bashir, Adnan Saeed, **Babar Shahzad Khan***, Mohammed Rafi Shaik, Merajuddin Khan, Baji Shaik, and Mujeeb Khan. "Evaluation of Photocatalytic, Antioxidant, and Antibacterial Efficacy of Almond Oil Capped Zinc Oxide Nanoparticles." *Materials* 16, no. 14 (2023): 5011. **IF 3.748**
3. Akram, Summeya, Mahwish Bashir, Farzana Majid, Maida Ayub, **Babar Shahzad Khan**, Adnan Saeed, Mohammed Rafi Shaik, Mujeeb Khan, and Baji Shaik. "Stabilization of zirconia nanoparticles by collagen protein and calcium carbonate extracted from eggshell and its biodegradation, radical scavenging and mineralization activity." *Arabian Journal of Chemistry* 16, no. 10 (2023): 105135. **IF 6.212**
4. Majid, Farzana, Mahwish Bashir, Ismat Bibi, Maida Ayub, **Babar Shahzad Khan**, Hamoud H. Somaily, Samiah H. Al-Mijalli, Arif Nazir, Shahid Iqbal, and Munawar Iqbal. "Green synthesis of magnetic Fe3O4 nanoflakes using vegetables extracts and their

magnetic, structural and antibacterial properties evaluation." Zeitschrift für Physikalische Chemie 237, no. 9 (2023): 1345-1360. **IF 3.0**

5. Bashir, Mahwish, Farzana Majid, Ismat Bibi, Zunaira Jamil, Adnan Ali, Nawal Al-Hoshani, Rania Ali El Hadi Mohamed, Munawar Iqbal, and Arif Nazir. "Spectroscopic investigation of phase transformation of calcium oxalate dehydrates (renal calculi) using acidic Bryophyllum pinnatom powder." Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 303 (2023): 123192.
6. Bashir, Mahwish, Farzana Majid, Rabia Sabir, Attia Falak, **Babar Shahzad Khan**, Tariq Mahmood, Ahmed M. Fouda, and Adnan Ali. "Facile green synthesis, analysis, in vitro antidiabetic and antimicrobial activity of ZnO macropores." *Bioprocess and Biosystems Engineering* 45, no. 12 (2022): 1993-2006. **IF 3.434**
7. Barkat, Faiqa, Marina Afzal, **Babar Shahzad Khan***, Adnan Saeed, Mahwish Bashir, Aiman Mukhtar, Tahir Mehmood, and Kaiming Wu. "Formation mechanism and lattice parameter investigation for copper-substituted cobalt ferrites from Zingiber officinale and Elettaria cardamom seed extracts using biogenic route." *Materials* 15, no. 13 (2022): 4374. **IF 3.748**
8. Tahir, Aberah, Adnan Saeed, Iqra Ramzan, Sardar Sikandar Hayat, Waqar Ahmad, Samia Naeem, Marina Afzal, Aiman Mukhtar, Tahir Mehmood, and **Babar Shahzad Khan***. "Mechanism for the formation of magnetite iron oxide nanostructures by Ficus carica dried fruit extract using green synthesis method." *Applied Nanoscience* 11, no. 6 (2021): 1857-1865. **IF 3.869**
9. Naeem, Samia, Tahir Mehmood, K. M. Wu, **Babar Shahzad Khan***, Abdul Majid, Khurrum Siraj, Aiman Mukhtar, Adnan Saeed, and Saira Riaz. "Laser surface hardening of gun metal alloys." *Materials* 12, no. 16 (2019): 2632. **IF 3.748**
10. Nabi, Shafqat, Abdul Waheed Anwar, Zafar Wazir, Sardar Sikandar Hayat, Muhammad Ahmad, Muhammad Tayyab, Kashif Nabi, Muhammad Shamoil, Adnan Ali Khan, and **Babar Shahzad Khan**. "Correlation between structural, electronic, and optical response of Ga-doped AlSb for optoelectronic applications: a first principle study." *The European Physical Journal B* 95, no. 3 (2022): 55. **IF 1.3**

11. Mehmood, Tahir, K. M. Wu, Aiman Mukhtar, Marina Afzal, and **Babar Shahzad Khan**. "Effect of Deposition Parameters on the Structure of ZnCo Alloy Nanowires and Growth Mechanism." *Journal of Electrical and Electronic Engineering* 8, no. 1 (2020): 10-15.
12. Mehmood, Tahir, Kaiming Wu, Aiman Mukhtar, Adnan Saeed, Sadaf Jamil Rana, Marina Afzal, Muhammad Furqan Rauf, and **Babar Shahzad Khan**. "Structural Analysis and Growth Mechanism of Zn/ZnO Nanowires in AAO Template by Electrodeposition." *American Journal of Chemical Engineering* 7, no. 1 (2019): 51-56.
13. Naqvi, Syed Muhammad Raza Shah, Taseer Muhammad, Hyun Min Kim, Tariq Mahmood, Adnan Saeed, and **Babar Shahzad Khan**. "Numerical treatment for Darcy–Forchheimer flow of nanofluid due to a rotating disk with slip effects." *Canadian Journal of Physics* 97, no. 8 (2019): 856-863. **IF 1.358**
14. Mukhtar, Aiman, Ming Tan, Hao Hu, Liping Liu, Tahir Mehmood, and **Babar Shahzad Khan**. "Formation of metastable Co–Ni Alloy nanowires in electrodeposition." *Journal of Nanoscience and Nanotechnology* 18, no. 2 (2018): 1296-1302. **IF 1.70**
15. Mukhtar, Aiman, **Babar Shahzad Khan**, and Tahir Mehmood. "Electrodeposition of Single Crystalline Co56. 48Ni43. 52 Alloy Nanowires in AAO Template." *American Journal of Electromagnetics and Applications* 5, no. 1 (2017): 1-6.
16. Mukhtar, Aiman, **Babar Shahzad Khan**, and Tahir Mehmood. "A study of growth mechanism of Fe nanowires and nanotube via template-based electrodeposition." *International Journal of Electrochemical Science* 12, no. 5 (2017): 4574-4584. **IF 1.541**
17. Mukhtar, Aiman, Tahir Mehmood, Kaiming Wu, **Babar S. Khan**, Humaira Latif, Zahida Parveen, and Syeda Ruqaya Kazmi. "Study of phase transformation and crystal structure of Co nanowires." *International Journal of Materials Research* 108, no. 9 (2017): 710-714. **IF 0.678**
18. Mehmood, Tahir, K. M. Wu, Aiman Mukhtar, **Babar S. Khan**, Adnan Saeed, Humaira Latif, Zahida Parveen, and Syeda Ruqaya Kazmi. "Electrochemically fabricated Fe–Ni alloy nanowires and their structural characterization." *International Journal of Materials Research* 108, no. 8 (2017): 688-692. **IF 0.678**
19. **Khan, Babar Shazad**, Adnan Saeed, Sardar Sikandar Hayat, Aiman Mukhtar, and Tahir Mehmood. "Mechanism for the formation of cuprous oxide nanowires in AAO template

by electrodeposition." *International Journal of Electrochemical Science* 12 (2017): 890-897. **IF 1.541**

20. Mehmood, Tahir, Aiman Mukhtar, **Babar Shahzad Khan**, Adnan Saeed, and Waqar Ahmad. "Electrochemical process and phase formation of Fe-based alloy nanowires into anodic alumina oxide." *International Journal of Electrochemical Science* 12, no. 2 (2017): 1203-1215. **IF 1.541**
21. Mehmood, Tahir, Aiman Mukhtar, **Babar Shahzad Khan**, and Wu Kaiming. "How Deposition Parameters Affect Phase Formation in Metals." *American Journal of Applied Chemistry* 4, no. 5 (2016): 192-200.
22. Mehmood, Tahir, Aiman Mukhtar, **Babar Shahzad Khan**, Adnan Saeed, and Waqar Ahmad. "Electrochemical process and phase formation of Fe-based alloy nanowires into anodic alumina oxide." *International Journal of Electrochemical Science* 12, no. 2 (2017): 1203-1215. **IF 1.541**
23. Mukhtar, Aiman, **Babar Shahzad Khan**, and Tahir Mehmood. "Appropriate deposition parameters for formation of fcc Co–Ni alloy nanowires during electrochemical deposition process." *Applied Physics A* 122 (2016): 1-9. **IF 2.983**
24. Saeed, A., M. Abrar, A. W. Khan, F. Jan, **B. S. Khan**, H. U. Shah, M. Zaka-ul-Islam, and M. Zakaullah. "Optical emission spectroscopy of 50 Hz pulsed dc nitrogen–hydrogen plasma in the presence of active screen cage." *Radiation Effects and Defects in Solids* 171, no. 5-6 (2016): 384-397. **IF 1.024**
25. Wang, Henghui, Guangqiang Li, Jian Yang, Jianghua Ma, and **Babar Shahzad Khan**. "The behavior of phosphorus during reduction and carburization of high-phosphorus oolitic hematite with H 2 and CH 4." *Metallurgical and Materials Transactions B* 47 (2016): 2571-2581. **IF 3.20**
26. Hou, Yanhui, Wan Zheng, Zhenhua Wu, Guangqiang Li, Nele Moelans, Muxing Guo, and **Babar Shahzad Khan**. "Study of Mn absorption by complex oxide inclusions in AlTiMg killed steels." *Acta Materialia* 118 (2016): 8-16. **IF 9.209**
27. Mehmood, Tahir, Aiman Mukhtar, **Babar Shahzad Khan**, and Kaiming Wu. "Growth mechanism of electrodeposited Fe, Co and Ni nanowires in the form of self-assembled arrays at fixed potential." *Int. J. Electrochem. Sci* 11, no. 2016 (2016): 6423-31. **IF 1.692**

28. Mukhtar, Aiman, Tahir Mehmood, **Babar Shahzad Khan**, and Ming Tan. "Effect of Co2+ concentration on the crystal structure of electrodeposited Co nanowires." *Journal of Crystal Growth* 441 (2016): 26-32. **IF 1.83**
29. Mehmood, Tahir, Aiman Mukhtar, Honghong Wang, and **Babar Shahzad Khan**. "Effect of deposition parameters on the crystal orientation and growth of Ag nanowires." *International Journal of Materials Research* 107, no. 3 (2016): 283-286. **IF 0.678**
30. Mehmood, Tahir, **Babar Shahzad Khan**, Aiman Mukhtar, and Ming Tan. "Influence of bath temperature and pH on the structure of electrodeposited cobalt nanowires." *International Journal of Materials Research* 106, no. 9 (2015): 957-961. **IF 0.678**
31. **Khan, Babar Shahzad**, Aiman Mukhtar, Tahir Mehmood, and Ming Tan. "Polarization curves of electrodepositing Ag and Cu nanowires." *Journal of Nanoscience and Nanotechnology* 16, no. 9 (2016): 9896-9900. **IF 1.70**
32. Mehmood, Tahir, **Babar Shahzad Khan**, Aiman Mukhtar, Xinqi Chen, Ping Yi, and Ming Tan. "Mechanism for formation of fcc-cobalt nanowires in electrodeposition at ambient temperature." *Materials Letters* 130 (2014): 256-258. **IF 3.574**
33. **Khan, Babar Shahzad**, Tahir Mehmood, Aiman Mukhtar, and Ming Tan. "Effect of workfunction on the growth of electrodeposited Cu, Ni and Co nanowires." *Materials Letters* 137 (2014): 13-16. **IF 3.574**

Book

Babar Shahzad Khan, and Sardar Sikandar Hayat, Interaction of Point Defects with Grain Boundaries, **LAP LAMBERT Academic Publishing**, Saarbrücken, Germany (**ISBN:** 978-3-659-41116-8)

Projects

Start-Up Research Grant Program, Template-assisted electrochemical synthesis of nanowires to improve the efficiency of energy storage and conversion devices, approved and funds released from Higher Education Commission, Pakistan (0.5 M PKR)

Interdisciplinary Projects

- Application of GIS and artificial intelligent network in devising disease predictive models and application of green synthesized nanomaterials in disease suppression, plant growth promotion and systemic resistance induction against tomato early blight disease, submitted to **Pakistan Agricultural Research Council** (**ID: CS0620;** Under expert's Evaluation Process)
- Artificial intelligent network and application of GIS in devising disease predictive system and application of encapsulated metal/metal oxide nanostructures in disease suppression, plant growth promotion and systemic resistance induction against red rot of sugarcane disease, submitted to **Sugarcane Research Board, Pakistan** (Under Expert's Evaluation Process)

Students' Supervision

MS Students Supervised:	>25
PhD Students under-supervision:	05
MS Student under-supervision:	08

Note: Details will be provided when enquired

Languages

- **English**: (Official language), Full professional proficiency
- **Urdu**: Native or bilingual proficiency
- **Chinese**: Elementary proficiency
- **Arabic**: Elementary proficiency

Extra-Curricular Activities

- **Black Belt (1st Dan):** in kukkiwon Taekwondo; No_05543275; Taekwondo Association China
- **Football Player:** District level player in Kakul Soccer Club

References

1. **Prof. Dr. Tan Ming**

   Professor

   College of Physical Science and Technology,

   Central China Normal University,

   Wuhan, 430079, China

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2. **Prof. Dr. Sardar Sikandar Hayat**

   Professor

   Department of Physics,

   Bahauddin Zakariya University, Multan, Pakistan

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