
PERSONAL INFORMATION

Name : Muhammad Shabir Mahr
Date of Birth : December 1, 1978
Marital status : Married (2 children)
Position : Assistant Professor (Materials Science / Physics)
Official Address : Department of Physics
University of Agriculture Faisalabad, Pakistan
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RESEARCH INTERESTS

Multifunctional Materials: Preparation of materials with exotic functionalities/effects like water-resistance, superhydrophobicity/Superhydrophilicity, Water-anti-damping, fire-retardance, Bio-durability etc.

Nanoscience & Nanotechnology: to tailor sol-gel derived nanosols, nanoparticles, nano-thin films / coatings, paints, composites / nanocomposites, organic-inorganic hybrid materials etc.

Photocatalysis: Special focus on development and evaluation of bioactive, visible light photo-catalysts for water purification /environmental protection and for water splitting technologies (hydrogen production).

Composites & Nanocomposites: synthesis and surface modification of graphene, GO, rGO, CQD and CNT and production of graphene/CNT/CQD based materials (composites) for various applications including electronics and solar cells. wood plastic composites (WPC), Wood-inorganic composites, chemical wood modification.

Polymer Physics / Polymer Analytics: soft matter physics, self-assembly behavior of macromolecules (surfactants, polymers/copolymers etc.), polymer matrix nanocomposites, bioplastics.

Computational Materials Science / Solar Cells: Designing of new materials with tuned optical (NLO) and optoelectronics and photovoltaic properties / efficient solar cells by DFT.

AWARDS / ACADEMIC HONORS

2015 **Best PhD Thesis Award 2015** by International Academy of Wood Science (IAWS) Paris, France.

2009 – 2012 **PhD Studentship** (under BAM innovation initiative-Inno-BAM) awarded by BAM German Federal Institute for Materials Research and Testing Berlin, Berlin, Germany.

ACADEMIC INFORMATION

2010 – 2013	PhD, specialization in Materials Science (Inorganic-wood-composites) , Georg-August University Göttingen, Göttingen, Germany (Worked in Federal Institute for Materials Research and Testing BAM Berlin, Germany).
2006 – 2008	MSc, Polymer Science specialization in Polymer Physics/Soft Matter , A joint master of Berliner Universities (Free University Berlin, Humboldt University Berlin & Technical University Berlin) and University of Potsdam, Potsdam, Germany (Master Thesis completed in Physics Institute HU Berlin, and Federal Institute for Materials Research and Testing BAM Berlin, Germany).
1999–2001	MSc, Physics specialization in Solid State Physics , Institute of Physics, University of Punjab Lahore, Lahore, Pakistan
1996 –1998	BSc, Major in Physics, Chemistry & Mathematics , Government College of Science Faisalabad, Faisalabad, Pakistan / University of Punjab Lahore, Pakistan

PROFESSIONAL EXPERIENCE

Sep., 2014 – Present	Assistant Professor in Materials Science/Physics in the Department of Physics University of Agriculture Faisalabad , Pakistan.
April, 2009 – June, 2013	Scientific Worker in BAM German Federal Institute for Materials Research and Testing Berlin, Berlin, Germany (Worked in Division 6.6 with Dr. habil. Thomas Hübert).
Sep., 2008 – March, 2009	Scientific Worker in Institute of Physics, Martin Luther University Halle, Halle Saale, Germany (NMR group of Prof. Dr. Kay Saalwächter).
March, 2007 – March, 2008	Research Assistant (with Prof. Dr. A. F. Thünemann) in BAM German Federal Institute for Materials Research and Testing Berlin, Berlin, Germany & Institute of Physics (with Prof. Dr. J. P. Rabe), Humboldt University Berlin, Berlin, Germany .
August, 2003 – Oct., 2005	Lecturer Physics, National Textile University (NTU) Faisalabad , Faisalabad, Pakistan.
Sep., 2002 – Jul., 2003	Physics Teacher, Divisional Model College (DMC), Faisalabad , Pakistan.

PUBLICATIONS

Book / Book Chapters

- T. Hübert and **M. Shabir Mahr**. Sol-gel wood preservation In: Handbook of Sol-Gel Science and Technology 2nd edition (2018) Springer-Verlag Switzerland online Doi:10.1007/978-3-319-19454-7_106-2.

Journal Articles

- Waqas Latif; M. Hanan, Aliza Jaffar, Areesha Shafique, Sana Aziz, Javed Iqbal, Kashif Kamran, Maryam Hina, **M. Shabir Mahr**, Ateeq ur Rehman. SFX-based hole transport materials for advancement in perovskite and organic solar cells: DFT computational insights and photovoltaic improvements. *Materials Science & Engineering B* (2025). Vol. 313, Article No. 117974, <https://doi.org/10.1016/j.mseb.2024.117974>
- Asma Bashir; Hafiz Muhammad Asif Javed; Muhammad Abdul Wasay; **M. Shabir Mahr**; Muhammad Zafar Iqbal. Variance based uncertainty relations and entanglement amplification for particles constrained on a torus. *The European Physical Journal C* (2024). Vol. 84:815, Article No. 13182, 10.1140/epjc/s10052-024-13182-x.
- Irsa Anjum, Muhammad Hanan, Umair, Javed Iqbal, Asma A. Alothman, Saikh Mohammad, Shahid Hussain, **M. Shabir Mahr**. Designing of Phenothiazine Dioxide Based Donor Molecules with Improved Photovoltaic Parameters for Efficient Perovskite Solar Cells. *Journal of Molecular Structure* (2024) Vol. 1312, Article No. 138606, <https://doi.org/10.1016/j.molstruc.2024.138606>.
- Qasim Ali, Haiqa Javed, Muhammad Ismaeel, Ali Raza Ayub, H. M. Asif Javed. Javed Iqbal, **M. Shabir Mahr**. Self-assembled crown ether (15CR5) with alkaline earth metals to stimulate nonlinear optical properties: The comprehensive study by silico technique. *Computational and Theoretical Chemistry* (2024), Article No. 114611. <https://doi.org/10.1016/j.comptc.2024.114611>.
- Muhammad Hanan, Mr. Umair, Javed Iqbal, Waqas Akram, Irsa Anjum, Muhammad Arslan, Muhammad Adnan, Kashif Kamran, Zahid Farooq, Rasheed Ahmad Khera, **M. Shabir Mahr**. Rational designing of phenothiazine dioxide-based hole transporting materials for efficient perovskite solar cells. *Solar Energy* (2024). Vol. 272: 112484. <https://doi.org/10.1016/j.solener.2024.112484>.
- Muhammad Yaseen, Zahid Farooq, Matloob Ahmad, Muhammad Abdullah Sultan, Muhammad Asam Raza, Jean-Yves Winum, Muhammad Mustafa Hussein, Mian HR Mahmood, Muhammad Tayyab, Muhammad Adnan Iqbal, **M. Shabir Mahr**. Synthesis and investigation of linear and nonlinear optical properties of an octahedral metalloporphyrin. *Optical Materials* (2024). Vol. 149: 115092. doi.org/10.1016/j.optmat.2024.115092.
- Syed Ali Behroz Gilani, Faheem Naseeb, Asma Kiran, Muhammad Umar Ihsan, Javed Iqbal, Hafiz Muhammad Asif Javed, Haq Nawaz Bhatti, Abdunnasser M. Karami, Shahid Hussain, **M. Shabir Mahr**. pH dependent synthesis of ceria nanoparticles for efficient sunlight-driven photocatalysis of methyl orange containing wastewater. *Optical Materials* (2024). Online Article No. 114871. <https://doi.org/10.1016/j.optmat.2024.114871>.
- A.A. Hussain, Kashif Kamran, M. Imran, A. Akram, Lin Li, M. Hina, M. Yasin Naz, **M. Shabir Mahr**, Athar Mahmood, A. A.A. Mahmood. Effect of experimental boundary conditions and treatment-time on the electro-desalination of soils. *Environmental Geochemistry and Health* (2024). Vol. 46, Article No. 63, <https://doi.org/10.1007/s10653-023-01830-2>.

- J. Rukhsar, M. Waqas, M. Shaban, S. I. Al-Saeedi, **M. Shabir Mahr**, T. H. A. Hasanin, M. A.A. Ibrahim, Rasheed Ahmad Khera. A DFT approach towards designing selenophene-based unfused small molecule acceptors by end-capped modification for improving the photovoltaic performance of organic solar cells. Journal of Physical Organic Chemistry (2023). Online <http://doi.org/10.1002/poc.4587>
- Mahira Rafiq, **M. Shabir Mahr**, Rida Imran, Mohamed Shaban, Sameerah I Al-Saeedi, Tamer HA Hasanin, Maham Salim, Mahmoud AA Ibrahim. Towards Development of High-Performance Perovskite Solar Cells Based on Pyrrole Materials for Hole Transport Layer by Using Computational Approach. Journal of Computational Biophysics and Chemistry (2023). DOI <https://doi.org/10.1142/S2737416523420127>.
- Kinza Hassan, **M. Shabir Mahr**, Javed Iqbal, Hafiz M. Asif Javed, Zulfiqar Ali Raza, Fahad Rasheed. Directional variability of wood properties in *Pinus wallichiana* and *Dalbergia sissoo* of South Asian origin. International Wood Products Journal (2023) Vol. 14 (2). DOI <https://doi.org/10.1080/20426445.2023.2232653>.
- Zahid Farooq, Raheel Ali, Nasar Ahmed, M. Fahad, Aqrab ul Ahmad, M. Yaseen, Mian H. R. Mahmood, Sajjad Hussain, Rehan, M. Zubair Khan, Tariq Jan, M. Abdul Qayyum, M. Afzal, **M. Shabir Mahr**, M. Shafique. Determination of the gold alloys composition by laser-induced plasma spectroscopy using an algorithm for matching experimental and calculated values of electron number density. Journal of Applied Spectroscopy (2023) Vol 90 (1). DOI 10.1007/s10812-023-01513-x.
- A. S. Alkorbi, H. M. A. Javed, S. Hussain, S. Latif, **M. Shabir Mahr**, M. S. Mustafa, R. Alsaiari, N. A. Alhemiar. Solar light-driven photocatalytic degradation of methyl blue by carbon-doped TiO₂ nanoparticles. Optical Materials (2022) 127: 112259. Doi.org/10.1016/j.optmat.2022.112259.
- M. Shafique, **M. Shabir Mahr**, M. Yaseen, Haq Nawaz Bhatti. CQD/TiO₂ nanocomposite photocatalyst for efficient visible light-driven purification of wastewater containing methyl orange dye. Materials Chemistry and Physics (2022) doi.org/10.1016/j.matchemphys.2021.125583.
- Q. Q. Afzal, K. Jaffar, M. Ans, J. Rafique, J. Iqbal, R. A. Shehzad, **M. Shabir Mahr**. Designing benzothiadiazole based highly efficient non-fullerene acceptor molecules for organic solar cells. Polymer (2021) 238: 124405. doi.org/10.1016/j.polymer.2021.124405.
- K. Memoona, F. Jilani, A. Ayub, Z. Naseem, A. R. Ayub, **M. Shabir Mahr**, J. Iqbal. Designing of cyanobenzene based small molecules with suitable photovoltaic parameters for organic solar cells. International Journal of Quantum Chemistry (2021) DOI: 10.1002/qua.26673.
- F. Jilani, J. Iqbal, I. Shahid, M. Yaseen, **M. Shabir Mahr**, M. Khalid, K. Ayub, Rational Design of Naphthalimide Based Small Molecules Non-Fullerene Acceptors for Organic Solar Cells. Computational & Theoretical Chemistry (2020) Doi: <https://doi.org/10.1016/j.comptc.2020.112916>.

- U. H. Siddiqua, M. Irfan, S. Ali, A. Sahar, M. Khalid, **M. Shabir Mahr**, J. Iqbal. Computational and experimental study of heterofunctional azo reactive dyes synthesized for cellulosic fabric. *Journal of Molecular Structure* (2020) 1221:128753 Doi.org/10.1016/j.molstruc.2020.128753.
- A. A. Kashmeri, F. Nawaz, M. Yousaf, Ahsan Shameem, **M. Shabir Mahr**, J. Iqbal, M. Shafique, Muhammad Asif Javed. Manganese incorporated Eosin Y dye/graphene nanocomposite: an efficient visible light active photocatalyst. *Russian Journal of Physical Chemistry B* (2020) 14(3):552-558.
- M. J. Asif, A. Ali, M. Z. Mazhar, A. Tanvir, B. Zia, I. Anmbreen, M. Z. Anjum, **M. Shabir Mahr**. Effect of different pre-treatments on seed germination of *Prosopis juliflora* and *Dalbergia sissoo*: a step towards mutation breeding. *Journal of Forest Science* (2020) 66:80-87. 10.17221/64/2019-JFS.
- H. M. A. Javed, A. A. Qureshi, M. S. Mustafa, W. Que, **M. Shabir Mahr**, A. Shaheen, I. Javed, S. Saleem, M. Jamshaid, A. Mahmood. Advanced Ag/rGO/TiO₂ ternary nanocomposite based photoanode approaches to highly efficient plasmonic dye-sensitized solar cells. *Optics Communications* (2019) Vol. 453 Doi.org/10.1016/j.optcom.2019.124408.
- H. Ramzan, S. Sadaf, J. Iqbal, I. Ullah, **M. Shabir Mahr**, E. Ali, A. Tariq, M. Shafique, Solar assisted cell wall disruption of indigenously isolated microalgae strains: process optimization. *Material Research Express* (2019) 6(6):065506 Doi.org/10.1088/2053-1591/ab0cb6.
- A. Shameem, A. Kashmeri, F. Nawaz, **M. Shabir Mahr**, A. Pervaiz, I. Javed. Photocatalytic performance of indigo-dye-doped graphene-supported BiVO₄ nanocomposite under visible light. *ChemistrySelect* (2018) 3(23):6701–6706 Doi.org/10.1002/slct.201800797.
- M. Farah, I. Javed, S. Zara, B. Eliasson, **M. Shabir Mahr**, A. Khurshid. Theoretical calculations of the optical and electronic properties of dithienosilole- and dithiophene-based donor materials for organic solar cells. *ChemistrySelect* (2018) 3(5):1593-1601 DOI: 10.1002/slct.201703086.
- M. Irfan, B. Eliasson, **M. Shabir Mahr**, I. Javed. Tuning the optoelectronic properties of naphthodithiophene based A-D-A type small donor molecules for bulk hetero-junction organic solar cells. *ChemistrySelect* (2018) 3(8):2352–2358 DOI: 10.1002/slct.201702764.
- **M. Shabir Mahr**, T. Hübert, I. Stephan, H. Militz. Decay protection of wood against brown rot fungi by titanium alkoxide impregnations. *International Biodeterioration and Biodegradation* (2013) 77:56-62. <http://dx.doi.org/10.1016/j.ibiod.2012.04.026>.
- **M. Shabir Mahr**, T. Hübert, I. Stephan, M. Bucker, H. Militz. Reducing copper leaching from treated wood by sol-gel derived TiO₂ and SiO₂ depositions. *Holzforschung* (2013) 67: 429-435. DOI 10.1515/hf-2012-0105.
- **M. Shabir Mahr**, T. Hübert, M. Sabel, B. Schartel, H. Bahr, H. Militz. Fire retardancy of sol-gel derived titania wood-inorganic composites. *Journal of Materials Science* (2012) 47:6849-6861. DOI 10.1007/s10853-012-6628-3.

- **M. Shabir Mahr**, T. Hübert, B. Schartel, H. Bahr, M. Sabel, H. Militz. Fire retardancy effects in single and double layered sol-gel derived TiO₂ and SiO₂ wood-inorganic composites. Journal of Sol-Gel Science and Technology (2012) 64:452-464. DOI 10.1007/s10971-012-2877-5.

Journal Articles (Under-Review)

- Umair, Muhammad Hanan, Irsa Anjum, Hadia Sadiq, Javed Iqbal, Qasim Ali, Haiqa Javed, Zareena Kausar, **M. Shabir Mahr**. Designing and optimization of broad-absorption donor- π -acceptor triphenylamine-based molecules for high-efficiency dye-sensitized solar cells. Journal of Molecular Modeling (2025).
- Aliza Jaffar, Muhammad Hanan, Sana Aziz, Areesha Shafique, Waqas Latif, Maryam Hina, Kashif Kamran, Javed Iqbal, **M. Shabir Mahr**. Enhanced performance via π -bridge alteration in phenothiazine based novel donors for efficient organic photovoltaics. International Journal of Quantum Chemistry (2025).

Other Publications

- **M. Shabir Mahr**. Wood modification with titania and silica-based precursors: A novel approach to prepare multifunctional sol-gel derived TiO₂ / SiO₂ wood-inorganic composites (2013) ISBN 978-3-95404-570-9 Cuvillier Verlag Göttingen Germany.
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