Dr. Wiqar Hussain Shah

Assistant Professor | Department of Physics, International Islamic University, H-10, Islamabad, Pakistan | wiqarhussain@yahoo.com, wqar.hussain@iiu.edu.pk, orcid.org/0000-0001-5760-9798

1. "Competing Interactions in Doped Manganites" by Wiqar Hussain Shah, ISBN 978-3-8465-1976-9, (2011), VDM Verlagsservicegesellschaft mbH, **Germany**, www.vdm-vsg.de.

EDUCATIONAL:

Ph.D. 2005: (Experimental Condensed Matter and Materials Physics)
Quaid-i-Azam University Islamabad, Pakistan

Ph.D. Thesis:
"Effects of Competing Interactions and Phase Separation in Rare-Earth Manganites"

M. Phil. 1999: (Experimental Condensed Matter and Materials Physics)
Quaid-i-Azam University Islamabad, Pakistan

M. Phil. Dissertation: "Effects of Dopants in Rare Earth Manganites"

M.Sc. 1996: (Physics): Gomal University D.I. Khan (KPK), Pakistan

M.Sc. Project: "Determination of Density of various Materials using Attenuation Co-efficient and to find Gamma-Ray Build-up Factor."

EXPERIENCE:

Employment:

1. **Assistant Professor**, Islamic International University, Islamabad, **Pakistan**, September, 2013- to pesent.
2. **Assistant Professor**, Department of Physics, King Faisal University, Hofuf, **Saudi Arabia**, February 02, 2010 to August, 2013.
3. **Postdoctoral Fellow:** Department of Chemistry, University of Waterloo, Waterloo, ON, **Canada**, March, 2008 - January, 2010.
4. **Visiting Research Faculty**: Department of Physics, Seton Hall University, South Orange, NJ, **USA**, November, 2007 - February, 2008.
5. **Postdoctoral Fellow:** Department of Materials Science & Engineering, University of Delaware, Newark, 19716, DE, **USA**, March, 2007 - February 2008.
6. **Assistant Professor**, Federal Urdu University, Islamabad, **Pakistan**, September, August, 2005- to February, 2007.

Adminstrative:

1. Member, Quality Assurence committee, Department of Physics, IIU, Islamabad.
2. Memer, Graudate research committee (GRC), Department of Physics, International Islamic University, Islamabad, September, 2013 to current.

3. Memer, Board of Study, Department of Physics, Faculty of Sciences, King Faisal University, Hofuf, Saudi Arabia, February, 2010 to August, 2013.
4. Memer, GRC, Department of Physics, Faculty of Sciences, King Faisal University, Hofuf, Saudi Arabia, February, 2010 to August, 2013.
5. Chairman deparment of Physics, Urdu University Islamabad, January, 2006 to February, 2007.

DISTINCTIONS

(1) General Motors Canada, Postdoctoral Fellowship-2008-2010, **Canada**.
(2) HEC Postdoctoral Fellowship for **USA** 2007-08
(3) Productive Scientist of Pakistan award 2002 & 2004.
(4) the **Abdus Salam** ICAC Felloship for Postgraduate studies (2000-2004).
(5) HEC Merit Scholarship for Higher Studies 1997-98 (M.Phil.).
(6) Higher Education Commission (HEC) of Pakistan Approved Ph.D. supervisor.
(7) Reviewer of the Journal of " Alloys and Compounds" Elsevier Science.
(8) Reviewer of the Journal of " Materials Letter" Elsevier Science.
(9) Reviewer of the Journal of " Materials Chemistry".
(10) Reviewer of the Journal of " Nano-Paticle Research (NANO)".

Teaching and Research:

Ph.D. Thesis Supervised (in-progress):

1. "Effects of dopping on the physical properties of diluted oxide $(Zn_{1-x}A_x)O_2$ nano-structure system": Muhammad Waqas, In progress, from August 2016.
2. "Effect of Dopants on thermoelectric properties of $Tl_{10-x}A_xTe_6$ Chalcogenide Materials": Muhammad Tufail, In progress, from August 2016.
3. Effects of dopants on the Power Factor of Tellurium Telluride Chalcogenide Nano-

system": Sabir Khan, In progress, from March, 2017

4.

M.S. Thesis Supervised:

1. "Effects of Ni dopping on the physical properties of $(Zn_{1-x}Ni_x)O_2$ nano-structure system": Muhammad Fawad, In-progress from September, 2016
2. "Optimization of physical properties of $(Zn_{1-x}Co_x)O_2$ nano-structure system": Adil Muhammad, In-progress from September, 2016.
3. "Particles size effects on the physical properties of $(Zn_{0.80}Mn_{0.20})O_2$ nano-structure system": Abdur Rahim, In-progress from September, 2016.
4. "Effects of Mn dopping on the physical properties of $(Zn_{1-x}Mn_x)O_2$ nano-structure system": Ghani-ur Rahman, In-progress from September, 2016.
5. "Effects of Pb dopping on thermal and transport properties of $Tl_{10-x}Sb_xTe_6$ nano-materials": Aqeel Khan, In-progress from September, 2016.
6. "Study of earthquick prediction..: Zakir Ullah, In-progress from February, 2016.

7. "Optimization of power factor in Sn doped $Tl_{10-x}Sn_xTe_6$ nano-structural system": Taj Ud Din, August, 2016.
8. "Enhancement of thermoelectric properties in Sb doped $Tl_{10-x}Sb_xTe_6$ nano-structural system": Sufaid Shah, August, 2016.
9. "Study of Fe dopped induced effects on physical properties of CuO Nanostructures": Asghar Ali, March, 2015 Co-supervised.

PhD/M.S.

1. PHY-644: Synthesis and Characterization of Nano-Structural Materials
2. PHY-652: Nano-Magnetism.
3. PHY-623-Nano-Materials and Applications
4. PHY-643: Nano-Growth Structure.

B.S/ M.Sc.

5. PHY-414-412-Physics at Nano-scale
6. PHY-424-421-Nano-Materials and Applications
7. PHY-470-Optoelectronics, Materials and Devices.
8. PHY-412-Solid state Physics-I and II
9. PHY-326: Electromagnetic theory-I and II

Preparatory Year (Medical Science, and Engineering)

10. PHY-101: General Physics-I
11. PHY-102: General Physics-II
12. PHY-201: Engineering Phyics

Area of Research

- Diluted Magnetic Oxide Semi-conductor Nano-Materials ($Zn_{1-x}A_xO$ and $(In_{1-x}A_x)_2O_3$ (A=Fe, Ni, Co, etc.)).
- New Materials for Thermoelectric and Phtothermoelectric Energy Conversion.
- Competing Interactions and Phase Separation in Rare-earth Manganites.
- Spintronics in Strongly Correlated Electronic system.
- Low dimensional system and Nano-scale magnetism.
- Transition metals oxides and orbital ordering.
- Spin dependent charge transport in magnetic nanostructures.
- Magnetism and Nano-Magnetic materials, Synthesis and Chracterization.

- **Research Project Approved / completed:**

- "Nano-Materials Engineering for Thermoelectric Power Generator" **Wiqar Shah (P.I),** King Abdulaziz City for Science & Technology, Riyadh, 1,872,000 SR (499,200 USD) (Submitted, September, 2012)

- "Diluted Magnetic oxide Semi-conductor Nano-Particles for Thermoelectric, Photothermoelectric and Gas sensor Applications" **Wiqar Shah (P.I),** King Abdulaziz City for Science & Technology, Riyadh, 455,000 SR (94,666 USD) (Approved, July, 2012)

- "Enhancement of Figure of Merit of Diluted Magnetic Oxide Semi-conductors Nano-particles for Thermoelectric Generators." **Wiqar Shah (P.I),** King Abdulaziz City for Science & Technology, Riyadh, 1,681,000 SR (448,266 USD) (Approved, December, 2011)

EEXPERIMENTAL EXPERTISE:

1. Synthesis and designing of Nano-structural materials (Solid State Reaction,Chemical Method, bulk, Thin Film by PVD, PLD, MOCVD, Inert gas condensation, etc).
2. X-Ray diffractometery (XRD) and energy dispersice x-rays spectroscopy (EDS).
3. Scan Electron Mircscopy (SEM) and Transmission Electron microscopy (TEM).
4. AC and DC resistivity and magnetoresistance (0.350 mK-700 K).
5. Thermoelectric and thermal conductivity (0.350 mK-700 K)
6. TGA and DSC analyzers for thermal properties of bulk, thin film and nano-materials.
7. Magnetometry (VSM) and Hall Effect.
8. AC and DC Susceptometry and Magnetometry (PPMS).

Experimental set-up Design:

- Designed and constructed of AC Susceptometer.
- Designed and construct of DC Solenoid magnet.
- Designed and construction of DC resistivity probe using the DC magnetic field of VSM.
- Designed and construct of Z-Meter (used for the measurements of thermoelectric and thermal conductivity, electric resistivity and specific heat).

PUBLICATIONS:

1. **Wiqar H Shah** "Synthesis and characterization of Diluted Magnetic oxide Semi-conductor Nano-Particles of $(Zn_{1-x}A_x)O$ and $(In_{1-x}A_x)_2O_3$ with $0.00 \leq x \leq 0.10$ (A=Mn, Fe, Co, Ni, Cu) for Thermoelectric power generators Applications" (under experiments).

2. **Wiqar H Shah**, Sufaid Shah, Waqas Khan, M. Tufail, Waqar Adil Syed "Enhancement of thermoelectric properties in Sb doped $Tl_{10-x}Sb_xTe_6$ nano-structural system" (Submitted to J. of Electronics materials April-2017)

3. **Wiqar H Shah**, Waqas M Khan, Taj-udin, M Tufail, Waqar Adil "Optimization of power factor in Sn doped $Tl_9Sb_{1-x}Sn_xTe_6$ thermoelctric chalcogenide nano-system" Chalcogenide Letters, (Submitted-2017).

4. **Wiqar H Shah**, Aqeel Khan, Waqas Khan, Waqar Adil Syed, "Effects of Pb doping on the Thermoelectric properties of $Tl_{8.67}Pb_xSb_{1.33-x}Te_6$ Materials" Chalcogenide Letters, **13**, 61 (2017)

5. **Wiqar H Shah**, "Competition of Magnetic Spin Interactions and Clusters Dynamics in Phase Separated $La_{1-x}Ca_xMnO_{3+\delta}$ Manganites" Current Applied Physics, CAP-D-11-01054, 2013.

6. Waqar A. Syed, Nouman Rafiq, Asad Ali, M. Saleem, **Wiqar Shah**, "Multi-layered AR Coatings of TiO2/MgF2 for Application in Optoelectronic Devices" Optik-international journal for light and electron optics, **136**, 564 (2017). http://dx.doi.org/10.1016/j.ijleo.2017.02.085.

7. **Wiqar H Shah**, Akif Safeen "Frequency Effects on ac Conductivity and Magnetoresistance in doped $La_{1-x}Ca_xMnO_3$ Manganites" J of Electronic Materials, **41**, 2243 (2012). doi: 10.1007/s11664-012-2092-8.

8. **Wiqar H Shah,** Kashif Safeen, G. Rehman, "Effects of Divalent Alkaline Earth Ions on the Magnetic and Transport Features of $La_{0.65}A_{0.35}Mn_{0.95}Fe_{0.05}O_3$ Compounds" Current Applied Physics, **12**, 742, (2012). doi: 10.1016/j.cap.2011.10.015.

9. **Wiqar H Shah**, "Dynamic Response in Fe doped $La_{0.65}Ca_{0.35}Mn_{1-x}Fe_xO_3$ Rare Earth Manganites" J. Materials Research, **26**, 2599, (2011). doi: 10.1557/jmr.2011.228.

10. **Wiqar H Shah,** A. Al Jaffari, "Cluster Co-existence and DC Field Effect on Re-entrant Spin Freezing behavior in Fe doped Rare Earth Manganites" Jpn. J. Appl. Phys. **50**, 053002, (2011). doi: 10.1143/JJAP.50.053002.

11. **Wiqar H Shah**, A. Mumtaz. "Frustrated Metastable Behavior of Magnetic and Transport Properties in Charge Ordered $La_{1-x}Ca_xMnO_{3+\delta}$. Manganites, J. Appl. Physics, **109**, 053707 (2011). doi:10.1063/1.3555621.

12. **Wiqar H Shah**, S.K. Hasanian "AC Susceptibility Studies in Fe doped $La_{0.65}Ca_{0.35}Mn_{1-x}Fe_xO_3$ Rare Earth Manganites", J. Appl. Physics, **108**, 113907 (2010). doi:10.1063/1.3517113.

13. M. Alper Sahiner, **Wiqar H Shah**, Marc Aranguren, Jeffrey Serfass, Joseph C. Woicik, "Local Crystal Structure Modifications in Pulsed Laser Deposited Colossal Magnetoresistive Oxide Thin Films" Materials Res. Soc. Symp. Proc. **1118**, K05-08, (2009).

14. Affia Aslam, **Wiqar Hussain Shah**, B. Ali, S.K. Hasanain, M.J. Akhtar, M. Nadeem, "Revival of Metastable Behavior in Phase separated $La_{1-x}Ca_xMnO_{3+\delta}$ (x~0.5)", Solid state Communication, **129**, 267 (2004). doi:10.1016/j.ssc.2003.10.004.

15. S.K. Hasanain, **Wiqar Hussain Shah,** Arif Mumtaz, M.J. Akhtar, M. Nadeem "Re-entrant Spin Freezing Behavior in Fe doped Rare Earth Manganites" J. Mag. & Mag. Mat. **271** 79 (2004). doi:10.1016/j.jmmm.2003.09.020.

16. **Wiqar Hussain Shah**, S.K. Hasanain "AC Conductivity in Polycrystalline $La_{1-x}Ca_xMnO_3$" J. Magnetism & Magnetic Materials, **246**, 199 (2002). doi:10.1016/S0304-8853(02)00054-9.

17. S.K. Hasanian, **Wiqar Hussain Shah**, M.J. Akhtar, M. Nadeem "Irreversible Electronic and Magnetic Transformations in CMR Compositions Close to Charge Ordering." Phys. Rev. B **65** 144442 (2002). DOI: 10.1103/PhysRevB.65.144442.

18. S.K.Hasanain, M. Nadeem, **Wiqar Hussain Shah**, M.J. Akhtar, M.M. Hasan "Effects of Fe Dopants on the Transport and Magnetic Behavior in $La_{0.65}Ca_{0.35}Mn_{1-y}Fe_yO_3$" J. Physics: Condensed Matter: **12**, 9007 (2000). doi:10.1088/0953-8984/12/42/307

SYMPOSIUM, AND CONFERENCES PRSENTATIONS:

1. **Wiqar H Shah**, "Enhancement of Figure-of Merit of Diluted Oxide Magnetic Nan-materials for the Energy Conversion" Innovations in Strongly Correlated Electronic Systems: School and Workshop" August 06-17, 2012, the **Abdus Salam** ictp, Trieste**, ITALY**.

2. **Wiqar Hussain Shah** (**Invited talk**), "Enhancement of Magnetic and Transport Properties in Doped Rare-Earth Manganites at the Nano-Scale "Nano-electronic devices for defense and Security conference", August 29 to September 1, 2011, New York University, New York, **USA.**

3. **Wiqar Hussain Shah**, "Jahn Teller Effects in doped Rare-earth Manganites", 20th International Symposium on the Jahn Teller Effects, August 16-20, 2010, University of Fribourg, Campus Perolles II. **SWITZERLNAD**.

4. **Wiqar Hussain Shah**, H. Klienke, "Enhancement of Seebeck co-efficient of TlSbTe materials for Thermoelectric power generation" 14th Canadian Semiconductor Technology Conference "Nano and Giga Challenges in Electronics, Photonics and Renewable Energy" August 10-14, 2009, Hamilton, ON, **CANADA**,

5. **Wiqar Hussain Shah**, H. Klienke, C. Bryan "Synthesis of TlSbTe materials for Thermoelectric power generation", 41st IDW2008, (41st Inorganic Discussion Weekend), 28-30 Nov., 2008", Department of Chemistry, University of Brock, 2008, ON, **CANADA**.

6. **Wiqar H Shah**, "Synthesis and characterization of Ag Nano-particles" International Conference on Semiconductor Technology, July 29-August 03, 2007, Brooklyn, New York, **USA**.

7. **Wiqar Hussain Shah**, A. Sahiner, A. Marc "Effects of Competing Interactions in Doped Rare-earth Manganites" The International Conference on Strongly Correlated Electron System, May13-18, 2007, Hilton American Houston and George R Brown Convention Center, Houston, Texas, **USA**.

8. **Wiqar H Shah**, "Jahn Teller Effects and Competing Interaction in Manganites" International Symposium on the "Jahn-Teller Effects: Novel Aspects in Orbital Physics and Vibronic Dynamics of Molecules and Crystals" August, 28-31, 2006, the **Abdus Salam** ictp, Trieste**, ITALY**.

9. **Wiqar Hussain Shah**, **"**Frustrated Magnetic Behavior in Manganites**"** Miniworkshop on New States of Stable and Unstable Quantum Matter" 14-25 August, 2006, the **Abdus Salam** ictp, Trieste**, ITALY**

10. **Wiqar Hussain Shah**, "Magnetism in Nano-Structural Materials" Fourth Stig Lundqvist Conference on "Advancing Frontier of Condensed Matter Physics" 3-7 July, 2006, the **Abdus Salam** ictp, Trieste**, ITALY**.

11. **Wiqar Hussain Shah**, "Effect of Competing Interactions in Doped Rare-earth Manganites" Workshop on "Ion Beam Studies of Nanomaterials: Synthesis, Modification and Characterization" 26 June - 1 July 2006, the **Abdus Salam** ictp, Trieste, **ITALY**.

12. **Wiqar Hussain Shah**, "Study of Magnetic Structure of the Magnetic Nano-Particles." JCNS Symposium and European User Meeting, 16-17 February 2006, Forschungszentrum Jülich, **GERMANY**.

13. **Wiqar Hussain Shah**, "World Conference on Physics and Sustainable Development" Oct 31-Nov 2, 2005, Durban **SOUTH AFRICA**.

14. **Wiqar Hussain Shah**, "Meta-stable Behavior with Thermal Cycling in Doped Rare-Earth Manganites" Workshop on Metamaterials for Microwaves and Optical Technologies, July 18-20, 2005, Palacio, San Sebastian, **SPAIN**.

15. **Wiqar H Shah**, "Preparation and Magnetic Characterization of Rare-earth Magnetic Nano-structure Materials" Conference on "Single Molecule Magnets and Hybrid Magnetic Nanostructures" June 27-July 01, 2005, the **Abdus Salam** ictp, Trieste, **ITALY**

16. **Wiqar Hussain Shah**, "Crystal Structure analysis of Fe doped Manganites" International School on "Mathematical and Theoretical Crystallography" June 20-24, 2005, Université Henri Poincaré Nancy I – **FRANCE**

17. **Wiqar Hussain Shah**, "Spinglass Behavior in Fe Doped Manganites" International Symposium on "Advance Materials and Processing" 6-8 December, 2004, Materials Science Centre, Indian Institute of Technology, Kharagpur**, INDIA**

18. **Wiqar Hussain Shah**, "Dynamic Response in doped Manganites" Summer School and Conference on "Dynamical Systems" July 19-Augut 06, 2004 the **Abdus Salam** ictp, Trieste, **ITALY**

19. **Wiqar Hussain Shah**, "Competing interactions in Manganites" **Workshop on** "Novel States and Phase Transition in Highly Correlated Matter" July 12-23, 2004, the **Abdus Salam** ictp, Trieste, **ITALY**

20. **Wiqar Hussain Shah**, S.K. Hasanain, "AC susceptibility studied in some doped Rare-earth Manganites" 8th International Symposium on Advanced Materials, 8-11 September 2003, Islamabad, **PAKISTAN**,

21. **Wiqar Hussain Shah**, "Re-entrant Spin Glass Behavior and Harmonics studies in Fe doped Rare Earth Manganites" 28th International Nathiagali Summer College on "Physics and Contemporary needs" 30th June to 12th July, 2003, Nathiagali, **PAKISTAN**

22. **Wiqar Hussain Shah**, "Dynamic Response in Fe doped $La_{0.65}Ca_{0.35}Mn_{1-x}Fe_xO_3$ Rare Earth Manganites"Summer College and Conference on "Physics and Chemistry of Rare-earth anganites" June-1-18, 2003,the **Abdus Salam** ictp, Trieste, **ITALY**

23. **Wiqar Hussain Shah**, ICTP-INFM Spring School on "Magnetic Properties of Condensed Matter Investigated by Neutron Scattering and Synchrotron Radiation" Miramare-Trieste, Italy, May, 19-28, 2003, the **Abdus Salam** ictp, Trieste, **ITALY**

24. **Wiqar Hussain Shah**, "School on Synchrotron Radiation and Application" Miramare-Trieste, Italy, April 22-May 24, 2002, the **Abdus Salam** ictp, Trieste, **ITALY**

25. **Wiqar Hussain Shah**, S.K. Hasanain, "Irreversible Magnetic Transformations in the ac Susceptibility in CMR Compositions Close to Charge Ordering." 26th International Nathiagali Summer College on "Physics and Contemporary needs" 26th June to 15th July, 2001, Nathiagali, **PAKISTAN**

26. **Wiqar Hussain Shah**, "Effects of Fe Doping on the Transport and Magnetic Behavior in $La_{0.65}Ca_{0.35}Mn_{1-y}Fe_yO_3$" 25th International Nathiagali Summer College on "Physics and Contemporary needs" 26th June to 15th July, 2000, Bhurban, **PAKISTAN**

REFERENCES:

1. Prof. Dr. Wqar Adil Syed
   Department of Phyics, Faculty of Basic and Applied Sciences,
   International Islamic University, H-10
   Islamabad, Pakistan
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   Principle Scientist

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3. Dr. Waheed S. Khan
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4. Rubi Gul
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