

Dr. Muhammad Rahim

Personal Bio Data



Father's Name: Muhammada Jan

Date of Birth: March 10, 1981

Marital Status: Married

Nationality: Pakistani

Gender: Male

Languages: English, Urdu, Pashtu

Parmanent Address: Village and Post Office: Gulabad, Tehsil: Adenzai, District: Dir (Lower)

Postal Address: Department of Physics, FOS, International Islamic University, Islamabad

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Academic Qualification

❖ **Ph.D**

Physics (Condensed Matter Physics)

(Department of Physics, Quaid-I-Azam University, Islamabad)

❖ **M.Phil (2009)**

Physics (Condensed Matter Physics)

(Department of Physics, Quaid-I-Azam University, Islamabad)
(First Division)

❖ **M.Sc (2005)**

Physics

Govt. Post Graduate Jahanzeb College Saidu Sharif Swat (University of Malakand)
(First Division)

❖ **B.Sc (2002)**

Physics, Math. A, Comp. Science

Govt. Degree College Thana, Malakand Agency (University of Peshawar)
(First Division)

- ❖ **F.Sc (1999)**
Govt. degree college Thana, Malakand Agency.
(Board of Intermediate and Secondary Education, Swat)
(First Division)
- ❖ **S.Sc (1997)**
Govt. high school Asbanr (Dir Lower).
(Board of Intermediate and Secondary Education, Swat)
(First Division)

Title of Ph.D Dissertation

“Synthesis of Cd substituted $(\text{Cu}_{0.5}\text{Ti}_{0.5})\text{Ba}_2\text{Ca}_{n-1}(\text{Cu}_{n-y}\text{Cd}_y)\text{O}_{2n+4-\delta}$ (n=3, 4) samples and study of their superconducting properties”

Scholarships won

1. Ph.D Indigineous Scholarship Batch-III (During M. Phil and Ph. D)

Research Projects

1. Start-up Reseach Grant Program (SRGP) worth Rs. 0.5 million funded by Higher Education Commission of Pakistan (HEC), completed sucessfully

Teaching Experience

S. #	Name of Institute / Organization	Period		Designation	Pay scale	Job Description	Nature of Job
		From	To				
1	International Islamic University Islamabad	Aug. 17, 2018	continue	Assistant Professor	19	Teaching and reaearch	TTS
2	Hazara University Mansehra	Sep. 2, 2016	Aug. 16, 2018	Assistant Professor	19	Teaching and reaearch	contract
3	Hazara University Mansehra	June 1, 2015	May 31, 2016	Assistant Professor	19	Teaching and reaearch	IPFP
4	Federal Urdu University Islamabad	Oct. 2010	June 2014	Lecturer	18	Teaching	Visiting
5	GDC Chakisar (Shangla)	Oct. 2006	Sep. 2007	Lecturer	17	Teaching	Contrac t
6	Jamal English Education Academy Chakdara (Dir L)	Nov. 2004	Oct. 2006	Lecturer	17	Teaching	Temporary

Publications

1. Vanadium oxide (V_2O_3) for energy storage applications through hydrothermal route.
Najmul Hassan, Junaid Riaz, Muhammad Tauseef Qureshi, Aamir Razaq, **Muhammad Rahim**, Arbab Muhammad Toufiq, Abdul Shakoor, Journal of Materials Science: Materials in Electronics 29 (2018) 16021–16026. <https://doi.org/10.1007/s10854-018-9689-5>. (I. F. =2.220)
2. Enhanced superconducting properties of Ti doped $(Cu_{0.5}Tl_{0.5})Ba_2(Ca_{2-x}Ti_x)Cu_3O_{10-\delta}$ samples.
Muhammad Arif, **Muhammad Rahim***, Najmul Hassan and Nawazish A. Khan, Journal of Materials Science: Materials in Electronics (2018). <https://doi.org/10.1007/s10854-018-9357-9> (I. F. =2.220)
3. Excess conductivity analyses of $(Cu_{0.5}Tl_{0.5})Ba_2Ca_3Cu_4O_{12-\delta}$ thin film samples synthesized at different temperatures and Post-annealed in flowing nitrogen atmosphere.
Nawazish A. Khan, Syed Hamza Safeer, **M. Rahim*** and Najmul Hassan, Journal of Materials Science: Materials in Electronics. (2017). <https://doi.org/10.1007/s10854-017-8134-5> (I. F. =2.220)
4. Excess conductivity analysis of $Cu_{0.5}Tl_{0.5}Ba_2Ca_{n-1}Cu_nO_{2n+4-\delta}$ ($n=2, 3, 4$) thin films.
Nawazish A. Khan, Syed Hamza Safeer, **M. Rahim**, M. Nasir Khan, and Najmul Hassan, Journal of Superconductivity and Novel Magnetism 30 (2017) 1493-1498.
<https://doi.org/10.1007/s10948-016-3942-z>. (I. F. =1.244)
5. Influence of Be Substitution on the Superconducting Properties of $(Cu_{0.5}Tl_{0.5})Ba_2(Ca_{2-y}Be_y)(Cu_{2.5}Cd_{0.5})O_{10-\delta}$ ($y=0, 0.1, 0.2, 0.35, 0.5$) Samples.
M. Rahim*, Najmul Hassan and Nawazish A. Khan, Journal of Materials Science: Materials in Electronics 28 (2017) 3509–3514. <https://doi.org/10.1007/s10854-016-5950-y>. (I. F. =2.220)
6. Influence of Ti doping on the superconducting properties of $YBa_2(Cu_{3-x}Ti_x)O_{7-\delta}$ materials.
Nawazish A. Khan, Abdul Sammed Khan, M. Nasir Khan, **M. Rahim** & Najmul Hassan, Journal of Materials Science:Materials in Electronics, 27 (2016) 12178.
<https://doi.org/10.1007/s10854-016-5372-x>. (I. F. =2.220)
7. Fluctuation induced conductivity analyses of Cd doped $Cu_{0.5}Tl_{0.5}Ba_2Ca_2Cu_{3-y}Cd_yO_{10-\delta}$ ($y=0, 0.5, 1.0, 1.5$) superconductors.

- Asad Raza, **M. Rahim***, and Nawazish A. Khan, *Ceramics International* 39 (2013) 4349.
<https://doi.org/10.1016/j.ceramint.2012.11.018> (I. F. =5.532)
8. Dielectric properties of oxygen post-annealed $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3(\text{Cu}_{4-y}\text{Cd}_y)\text{O}_{12-\delta}$ bulk Superconductors.
M. Mumtaz, **M. Rahim**, Nawazish A. Khan, K. Nadeem, and Khurram Shehzad, *Ceramics International* 39 (2013) 9591. <https://doi.org/10.1016/j.ceramint.2013.05.078> (I. F. =5.532)
9. Study of Mg-doped $(\text{Cu}_{0.5}\text{Tl}_{0.5})\text{Ba}_2(\text{Ca}_{2-y}\text{Mg}_y)(\text{Cu}_{2.5}\text{Cd}_{0.5})\text{O}_{10-\delta}$ ($y=0, 0.05, 0.1, 0.25, 0.5, 0.75, 1.0$) superconductors.
M. Rahim* and Nawazish A. Khan, *Journal of Alloys and compounds* 572 (2013) 74.
<https://doi.org/10.1016/j.jallcom.2013.03.219> (I. F. =6.371)
10. Temperature and Frequency Dependent Dielectric Properties of $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3(\text{Cu}_{4-y}\text{Cd}_y)\text{O}_{12-\delta}$ Bulk Superconductors.
M. Rahim, Nawazish A. Khan and M. Mumtaz, *J. Low Temp. Phys.* 172 (2013) 47.
<https://doi.org/10.1007/s10909-012-0840-z> (I. F.=1.090)
11. Suppressed phonon density and para conductivity of Cd doped $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3\text{Cu}_{4-y}\text{Cd}_y\text{O}_{12-\delta}$ ($y=0, 0.25, 0.5, 0.75$) superconductors.
M. Rahim and Nawazish A. Khan, *Journal of Alloys and compounds* 513 (2012) 55.
<https://doi.org/10.1016/j.jallcom.2011.09.068> (I. F. =6.371)
12. Excess Conductivity Analysis and the Critical Region in Be-Doped $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2(\text{Ca}_{1-y}\text{Be}_y)\text{Cu}_{0.5}\text{Zn}_{1.5}\text{O}_{8-\delta}$ Superconductors.
M. Rahim*, Kefayat Ullah and Nawazish A. Khan, *J. Supercond. Nov. Mag.* 25 (2012) 975.
<https://doi.org/10.1007/s10948-012-1405-8> (I. F. =1.244)
13. Critical regime and suppression of the pseudo-gap in $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3\text{Cu}_{4-y}\text{Zn}_y\text{O}_{12-\delta}$ superconductors via excess conductivity analyses.
Nawazish A. Khan, **M. Rahim**, and M. Mumtaz, *Physica C* 478 (2012) 32.
<https://doi.org/10.1016/j.physc.2012.03.017> (I. F.=1.241)
14. Superconducting properties of Cd doped $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3\text{Cu}_{4-y}\text{Cd}_y\text{O}_{12-\delta}$ ($y=0, 0.25, 0.5, 0.75, 1.0$) superconductors.
Nawazish A. Khan and **M. Rahim**, *Journal of Alloys and compounds* 481 (2009) 81.
<https://doi.org/10.1016/j.jallcom.2009.03.137> (I. F. =6.371)

15. Enhanced Coherence length and interplane coupling by Ti doping in (Cu, Tl)-1223 superconductors: Para Conductivity analyses.
Muhammad Arif, **Muhammad Rahim*** and Nawazish A. Khan, *Ceramics International* (2019). <https://doi.org/10.1016/j.ceramint.2019.10.026> (I. F.= 5.532).
16. Dielectric Response of (M)z/CuTl-1223 (M=Co, Cr) Nanoparticle-Superconductor Composites.
M. Rahim*, M. Amir Durrani, M. Mumtaz, M. Sohail, M. Qasim and M. Nasir Khan, *Physica C* 570 (2020) 135360. <https://doi.org/10.1016/j.physc.2020.1353601> (I. F= 1.241)
17. Frequency and temperature dependent dielectric constant of (Ag)_x/CuTl-1223 nanoparticles-superconductor composites.
Abrar A. Khan, M. Sohail, **M. Rahim***, M. Mumtaz and M. Nasir Khan, *Journal of Alloys and Compounds* 825 (2020) 154138; <https://doi.org/10.1016/j.jallcom.2020.154138> (I.F= 6.371).
18. Effects of Non-magnetic Metallic Zinc Nanoparticles on the Dielectric Properties of CuTl-1223 Superconducting Phase.
Abrar A. Khan, M. Mumtaz, Mubasher, M. Khan, Liaqat Ali, **M. Rahim** and M. Ali, *Journal of Superconductivity and Novel Magnetism* 34 (2021) 1341-1350 ;
<https://doi.org/10.1007/s10948-021-05862-6> (I. F.=1.244)
19. Impact of High Pelletize Pressure on Superconducting Properties of (Cu)_x/CuTl-1223 Composites
Yaseen Muhammad, M. Mumtaz, Liaqat Ali, M. Ali, Mubasher, M. Rahim, Nazir Hussain and Zafar Iqbal, *Journal of Superconductivity and Novel Magnetism* 35 (2022) 669-678;
<https://doi.org/10.1007/s10948-021-06122-3> (I. F.=1.244).
20. Wet-chemical assisted synthesis of MnSe/ZnO nanostructures as low-resistance robust novel cathode material for advanced hybrid supercapacitors
Muhammad Zia Ullah Shah, Muhammad Sajjad, Muhammad Sanaullah Shah, **Muhammad Rahim**, Shams ur Rahman, Hongying Hou, Afaq Ullah Khan and A. Shah, *New Journal of Chemistry* 47 (2023) 8002-8012.
<https://doi.org/10.1039/D2NJ05682H> (I.F=3.925).

21. Comparative investigation of low and high pelletize pressure for (Ag)_x/CuTl-1223 nanoparticles-superconductor composites

Yaseen Muhammad, **M Rahim**, M Mumtaz, Nazir Hussain and Bahar Hussain, Phys. Scr. 98 (2023) 125967. <https://doi.org/10.1088/1402-4896/ad0c11>

22. Enhanced transport properties of (Ag)_x/CuTl-1223 nano-composites with the application of high pelletization pressure

Yaseen Muhammad, Muhammad Rahim, Nazir Hussain, Zafar Iqbal and Aamir Naseem, Applied Physics A (2024) 130:634; <https://doi.org/10.1007/s00339-024-07801-3>

23. Enhancing grains connectivity and superconductivity in (Cu)_x/ CuTl-1223 nano-particles superconductor composites under high pelletize pressure

Yaseen Muhammad, Muhammad Rahim, Nazir Hussain and Zafar Iqbal, Applied Physics A (2024) 130:568 <https://doi.org/10.1007/s00339-024-07722-1>

24. Impact of reduced graphene oxide on La_{0.5}Ca_{0.5}MnO₃ nanocomposite electrode for high-performance energy storage application

Kamran Shahzad, M. Rahim, Hafiz Zahid Shafi, A. Shah, and Imosobomeh L. Ikhioya, Journal of Material Science 2024, <https://doi.org/10.1007/s10853-024-10200-x>

MS Students Supervised

S. No.	Name	Reg. No.	Year of completion
1	Muhammad Sohail	497-FBAS/MSPHY/F-17	2019
2	Muhammad Amir Durrani (Co-supervision)	498-FBAS/MSPHY/F-17	2019
3	Muhammad Shoaib	545-FBAS/MSPHY/F18	2020
4	Syed Hussnain Raza Shah	615-FBAS/MSPHY/F19	2021
5	Abdul Ghaffar	640-FBAS/MSPHY/S22	2023
6	Maaz Khan		2024

Ph.D Students Under Supervision

S. No.	Name	Reg. No.
1	Kamran Shahzad	113-FBAS/PHDPHY/F20

BS Students Supervised

S. No.	Name	Reg. No.	Year of completion
1	Nouman Mustafa	971-FBAS/BSPHY/S16	2020
2	Muhammad Abdul Wahab	964-FBAS/BSPHY/S16	2020
3	Maneeb-ur-Rehman	996-FBAS/BSPHY/S16	2020
4	Tahir Khan	1027-FBAS/BSPHY/F16	2021
5	Shah Fahad Khan	1029-FBAS/BSPHY/F16	2021
6	Anees Ahmad	1024-FBAS/BSPHY/F16	2021
7	Muhammad Kamran Khan	1054-FBAS/BSPHY/F16	2021
8	Muhammad Irshad	1016-FBAS/BSPHY/F16	2021
9	Abdul Wahab	998-FBAS/BSPHY/S16	2021
10	Rashid Jalil	1100-FBAS/MSCPHY/S20	2021
11	Imran Qayyum	1433-FBAS/BSPHY/F18	2022
12	Abuzar Shahid	1439-FBAS/BSPHY/F18	2022
13	Muhammad Usman	1420-FBAS/BSPHY/F18	2022
14	Mobeen Khan Jadoon	1402-FBAS/BSPHY/F18	2022

15	Haris Munir	1419- FBAS/BSPHY/F18	2022
16	Shehryar Bajwa	1391- FBAS/BSPHY/S18	2022
17	Muhammad Ijaz Ali	1434- FBAS/BSPHY/F18	2022
18	Arslan Shauqat	1402- FBAS/BSPHY/F18	2022
19	Tahir Taj	1805- FBAS/BSPHY/F19	2023
20	M. Usama Rahim	1806- FBAS/BSPHY/F19	2023
21	M. Usman Malik	1736- FBAS/BSPHY/F19	2023
22	M. Ubaid Mahmood	1754- FBAS/BSPHY/F19	2023
23	Awais Ali Khan	1750- FBAS/BSPHY/F19	2023
24	Syed Qasim Shah	1718- FBAS/BSPHY/F19	2023
25	M. Ammar Bin Masood	1773- FBAS/BSPHY/F19	2023
26	Salman Bin Zahid	1724- FBAS/BSPHY/F19	2023

Conferences Attended

1. 1st International Conference and 4th International Workshop on Materials Modeling and Simulations held at Centre for Computational Materials science, University of Malakand, October 24-26, 2022.
2. 6th International Conference on Nano-Materials Modeling and Simulation held at the Department of Physics, Allama Iqbal Open University Islamabad, December 15-16, 2021.

3. International Conference on Nano - Material, Modeling and Simulation **ICNMMS 2020**) held at Allama Iqbal Open University, March 7-8, 2020.
4. First National Conference on Advances in Physics (NCAP 2017) held at University of Malakand, November 6-7, 2017.
5. Seminar on Research Reactor Utilization held at PINSTECH Islamabad, June 19-21, 2012.
6. 2nd International Workshop on Materials Modeling and Simulations (IWMMS 2012) held at University of Malakand, May 21-24, 2012.
7. 4th International Scientific Spring 2012, held at National Center for Physics (NCP) Islamabad, March 5-9, 2012.
8. Workshop on Nano-Materials & Regional Meeting of Nanomaterials Forum organized by PIEAS and Department of Physics, University of Peshawar, held at University of Peshawar April 23, 2008.

Practical Work

-  Synthesis of bulk Superconductors
-  Four probe resistivity measurements
-  Magnetic Susceptibility measurements
-  FTIR Spectroscopy and its analysis
-  Operating X-ray diffractometer and XRD analysis
-  Measurements of dielectric constant and its interpretation

Fields of Interest

-  Condensed Matter Physics, Material Science, Energy storage Material

References

1) Prof. Dr. Nawazish Ali Khan

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2) Prof. Dr. Muhammad Mumtaz

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3) **Prof. Dr. Mushtaq Ahmad**

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International Islamic University, Islamabad

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