

Website Information
Department of Physics
Dayananda Sagar University

Faculty details :

Item	Details
Faculty Name:	Dr. Aakansha
Room No:	A-318
Designation:	Assistant Professor
Contact No & E-Mail	aakansha-phy@dsu.edu.in , aakanshamailbox@gmail.com
Research Area:	Material Science (Polymer composites, Magnetic, Dielectric, Multiferroics, EMI Shielding, Antenna, Energy harvesting)

Publications (Past 5 years)	1. S. K. Srivastava, Aakansha, S. S. Baro, B. Narzary, D. R. Basumatary, R. Brahma, S. Ravi, “Crystal Structure and Magnetic Properties of (Co-Ag) co-doped SnO₂ Compounds”, Journal of Superconductivity and Novel Magnetism, 34 (2021) 461–467. 2. R. Hussain, Aakansha, S. Ravi, S. K. Srivastava, “Magnetic properties of ordered array of nanobumps of [Co/Ni](4,10,20) multilayers”, Solid State Communications, 324 (2021) 14144. 3. Sikha Sarmah, Aakansha, PK Maji, S Ravi, Tribedi Bora, “Effect of cation distribution and temperature variation on magnetic and dielectric properties of manganese substituted cobalt ferrites”, Solid State Communications, 324 (2021) 114146. 4. B. Brahma, R. Hussain, Aakansha, Pratap Behera, S Ravi, R. Brahma and S. K. Srivastava “Tuning the perpendicular magnetic anisotropy of [Co(0.3nm)/Ni (0.6nm)]20 multilayer thin films”, Thin Solid Films, 728 (2021) 138689. 5. P.M.Z. Hasan, Shivratan Saini, A.A. Melaibari, N.S. Leel, Aakansha, Reem Darwesh, A.M. Quraishi, P.A. Alvi, Jasgurpreet Singh, A.E. Kuznetsov, S.Z. Hashmi, Saurabh Dalela Tunable optical and structural characteristics with improved electrical properties of (PVA-GO-CuO) eco-friendly-polymer nanocomposites and their DFT study”, Diamond and Related Materials, 140 (2023) 110425. 6. Jyoti Arya, Narendra S. Leel, Aakansha, Abdul Mosawir Quraishi, Sonia Zeba Hashmi, Shalendra Kumar, Banwari Lal Choudhary, Saurabh Dalela, Zafrul Hasan, Jasgurpreet Singh, and Parvez A. Alvi “Enhancement of Dielectric Response and Optical Bandgap Tuning with Improving Surface Morphology of Recyclable Polyvinyl Alcohol–CeO₂ Polymer Nanocomposites”, Phys. Status Solidi A 220 (2023) 2300742. 7. Sarita, Anchal, Priya, R.K. Beniwal, M.S. Rulaniya, P.M. Saini, Pooja Yadav, Upendra Kumar, Aakansha, P.A. Alvi, B.L. Choudhary, “Development and characterization of superparamagnetic Zn-Doped Nickel ferrite nanoparticles”, J Magn. Magn. Mater. 610 (2024) 172547. 8. Neha Sharma, Aakansha, M. G. Siddiqui, Saurabh Dalela, Shalendra Kumar, S. Z. Hashmi, M. Ayaz Ahmad, A. M. Quraishi, P. A. Alvi, Structural, Optical, and Electrical characteristics of Synthesized Novel and Flexible PCCCe Polymer Nanocomposites for EMI Shielding Applications”, J. Appl. Poly. Sci. 142 (2025) e56835 9. Aakansha, S. Ravi “Tuning Magnetic Behavior of La Substituted Gd₃Fe₅O₁₂: An Experimental Study”, IEEE Mag. Lett., 1-5 (2025) 10. Mamta, Neha Singh, Anita, Seema Verma, P.A. Alvi, Aakansha “Electron Density Mapping and Optical Characteristics of BaAl₂O₄ Synthesized via Sol-Gel Method”, Springer Nature Proceedings, 136-148 (2025) 11. Neha Sharma, Aakansha, Shalendra Kumar, Saurabh Dalela, S. Z. Hashmi, M. Ayaz Ahmad, Mohammed Ezzeldien, Neha Munjal, Birendra Singh, Pravin Kumah, P. A. Alvi, “Tailoring the optical, Raman and structural characteristics of PCCCe polymer nanocomposite by 1.3 MeV gamma irradiation”, Composite Interfaces, 1–24 (2025)
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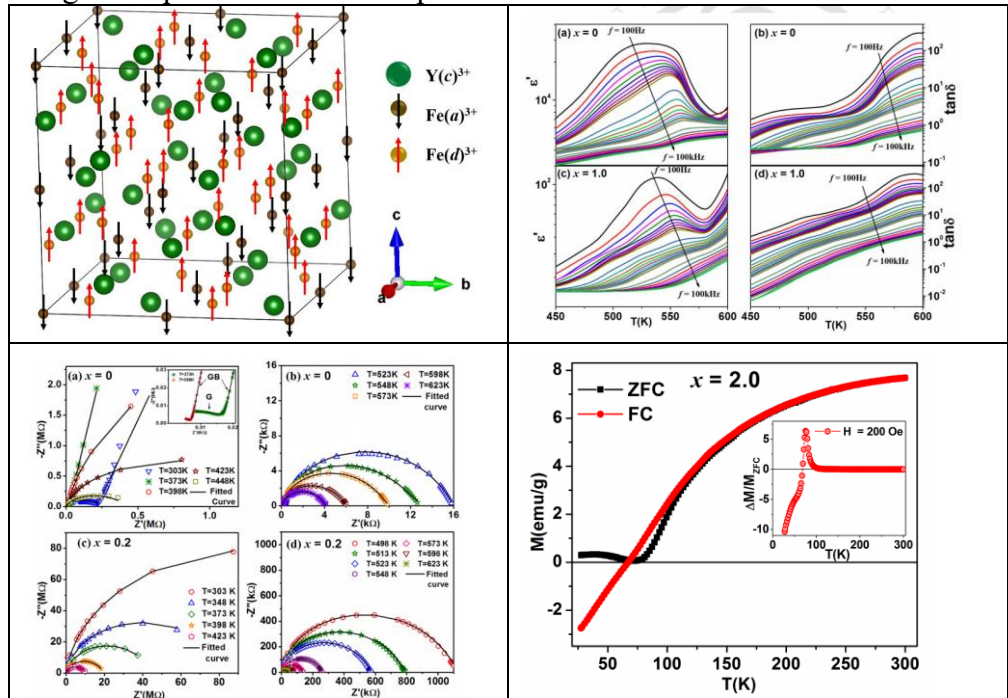
Publications (Past 5 years)	12. Seema Verma, Aakansha, Kapil Dev, Abhinav Bhargav, Parvez A Alvi, Neha Singh, “Luminescent Behavior of NaSr1–xPO4: xTb:-Structural and Optical Characterization for Advanced Lighting Applications”, Optical materials 168 (2025) 117361 13. Swarnkesh Loyalka, SB Dangi, SZ Hashmi, BL Choudhary, Saurabh Dalela, AM Quraishi, Shalendra Kumar, Aakansha, M Ayaz Ahmad, PA Alvi, “Improved functional properties of unique and novel PVDF/Ppy/ZnO (PPZ) polymer nanocomposites”, Composite Interfaces, 1-18(2025) 14. KK Khichar, Ravina, SB Dangi, SZ Hashmi, BL Choudhary, NS Leel, Saurabh Dalela, AM Quraishi, Shalendra Kumar, Balsam FI Sofi, Aakansha, P.A. Alvi “Tuning the properties of novel and biodegradable ethyl-cellulose (EC)/rGO nanocomposites”, International Journal of Polymer Analysis and Characterization 30 (2025) 711-727. 15. Mamta, Neha Singh, Anita, Shalini Verma, S. Ravi, P.A. Alvi, Aakansha, “Inspection of structural and high temperature dielectric characteristics of CAO-Zn ceramic material for high frequency applications”, Ceramics International (2025) 16. Jyoti Arya, Jyoti Sahu, Aakansha, S.Z. Hashmi, Shalendra Kumar, Saurabh Dalela, M. Ayaz Ahmad, B.L. Choudhary, Mohammed Ezzeldien, A.M. Quraishi, P.A. Alvi, “Tuning the comprehensive properties of PVA/GO/CeO2 nanocomposites: Structural, optical, Raman, surface morphology, and electrical insights”, Ceramics International (2025), https://doi.org/10.1016/j.ceramint.2025.12.352. 17. Pallabi Saha, Onus Manner, Aakansha, Tribedi Bora, “Tailoring the structural, magnetic and dielectric properties of terbium iron garnet through bismuth substitution synthesized by solid state reaction method”, Ceramics International (2026), https://doi.org/10.1016/j.ceramint.2026.02.143 18. Neha Sharma, Aakansha, S. Z. Hashmi, and P. A. Alvi “Investigating the Photoluminescence Property of Advanced PCG and PCPtG Polymer Nanocomposites”, International Journal of Nanoscience (2026), https://doi.org/10.1142/S0219581X2640003X 19. Neha Sharma, Aakansha, Shalendra Kumar, Saurabh Dalela, S.Z. Hashmi, M. Ayaz Ahmad, Mohammed Ezzeldien, B.L. Choudhary, P.A. Alvi “Exploring and tailoring the characteristics of biocompatible next-generation soft materials: PCG and PCPtG polymer nanocomposites”, Diamond and Related Materials 164 (2026) 113454.
Profile Links: Scopus and Orcid	Vidwan: https://vidwan.inflibnet.ac.in/profile/336520 Google Scholar: https://scholar.google.com/citations?user=xS788MEAAAAJ&hl=en Scopus ID : 58763466000 Orcid ID : 0000-0001-8614-2162

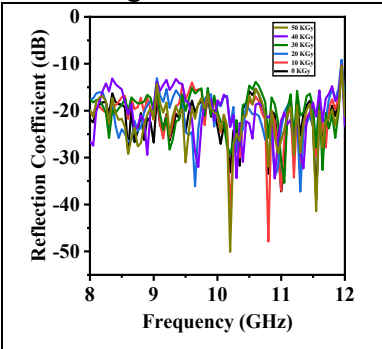
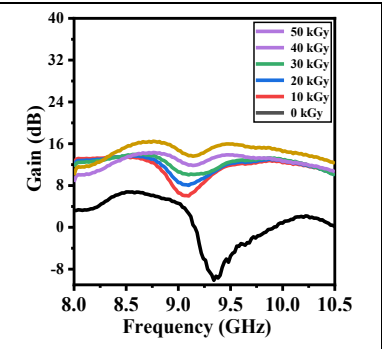
Research Activities
(Write about your best research results max of 2-3 pages including diagrams)

My research focuses on developing next-generation multifunctional materials by integrating advanced ceramics, magnetic oxides, multiferroics, and flexible polymer nanocomposites for applications in energy harvesting, electromagnetic interference (EMI) shielding, high-frequency communication, dielectric resonator antennas. My specialization is in defect engineering, crystal structure optimization, and interface design to tailor magnetic, dielectric, pyroelectric, and electrical properties. Using advanced synthesis, characterization, and impedance analysis, I establish structure–property relationships that enable high-performance functional materials.

The summary of my research work is as follows:

Across the reported studies, the synthesized functional oxide and polymer nanocomposite materials demonstrate significant improvements in their structural, electrical, dielectric, and electromagnetic properties through appropriate compositional engineering. In the rare earth doped yttrium iron garnet (YIG) and Gadolinium Iron Garnet (GdIG) ceramics, magnetic transition, magnetization reversal, impedance spectroscopy revealed a clear reduction in grain and grain-boundary resistance with Sm substitution, resulting in enhanced AC conductivity. The conductivity behavior follows Jonscher's universal power law, while the temperature-dependent analysis confirmed that the conduction mechanism is predominantly governed by the overlapping large polaron tunneling (OLPT) model, indicating efficient charge transport at elevated temperatures.



	The PCCCe polymer nanocomposite exhibits outstanding functional performance. Gamma irradiation enhanced the cross-linking within the polymer matrix, improved the dispersion of CeO₂ nanofillers, and strengthened the interfacial interactions, resulting in superior mechanical stability and electromagnetic shielding performance. The material achieved an excellent total electromagnetic interference (EMI) shielding effectiveness of approximately 78 dB in the X-band at a gamma dose of 50 kGy, corresponding to an attenuation efficiency exceeding 99.999999% of incident electromagnetic radiation.  
Collaborations	1. NIT Meghalaya 2. CIT Kokrajhar 3. IIT Guwahati 4. Banasthali Vidyapith 5. IIIT Allahabad
Invited Talks	1. Invited Speaker in National Conference on “Emerging Trends in Science and Technology” 2. Invited Speaker in “Faculty Development Program (FDP) cum Workshop: Frontiers in Multidisciplinary Research”. 3. Invited talk in “Physics on Friday” in DDU Gorakhpur University. 4. Invited Speaker in International Conference for Women in Multifaceted Research 5. Invited Speaker in National seminar on Ferroelectrics and dielectric
Group Members (PhD Students and Projects) Open Positions: If any	A PhD position is available.