

CURRICULUM VITAE

Dr. Piyush Kumar Patel

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Date of Birth	: 08-02-1986	
Present Position	: Assistant Professor G-I, Physics, Maulana Azad National Institute of Technology Bhopal, India (Since 07-01-2019)	
Specialization	: Functional Materials, Nanogenerator, Nanoscale Thin Films & Devices, Polymer Nanocomposite, Quantum Dot, Solar Cells	

Academic Qualification : **Ph.D. Physics 2014 I.I.T. Roorkee**

M.Sc. Physics	2008	D.D.U. Gorakhpur University, Gorakhpur	73%
B.Sc. (PCM)	2006	D.D.U. Gorakhpur University, Gorakhpur	70%
Intermediate	2003	M.G. Inter College, Gorakhpur	71.2%
High School	2001	U.P. Board	77.7%

Employment : Teaching & Research

Name of the Employer	Designation	Period	
		from	to
Gurukula Kangri Vishvidyalaya, Haridwar	Assistant Prof (Regular)	16-11-2018	05-01-2019
Vardhaman College (P.G.), Bijnor	Assistant Prof (Regular)	21-03-2017	15-11-2018



Research Publications (till 11-10-2025)		
International Journal: 32		
Book Chapter: 05		
International Conference Proceeding (Scopus): 06		
National Conference Proceeding (Scopus): 04		
Google Scholar Citations (till 11-10-2025)		
Citation	h-index	i10-index
1048	16	26



Achievement: Honors/Awards:

- **Top 2% Scientist list Stanford University, 2024 and 2025**
- **Best Research Paper Award: ICAM 2023, National Conference on Advances in Physics-2012, I.I.T. Roorkee, India**
- **Winners of Materials Today Cover Competition 2016**
(<http://www.materialstoday.com/amorphous/articles/s1369702115004022/>)
- University top 1% rank in NGPE/ IAPT 2006-2007 (D.D.U. Gorakhpur University, Gorakhpur)
- **CSIR-JRF-NET 2009**, GATE, 2009, JEST, 2010

Abroad Visited: Japan (Nov. 4-8, 2013, ACSIN-12 & ICSPM21)

Memberships (Life Time): 1. Indian Physics Association (IPA), 2. Indian Science Congress Association (ISCA) 3. Indian Association of Physics Teacher (IAPT) and 4. Materials Research Society of India, 5. IEEE (2022-2023)

Supervised PG (M.Sc./M. Tech.) Project: 15, **Supervising Ph.D. Student:** 02

Organised One Week/Two week National Workshop/STTP: 02/01

Expert Lecture/Talk Delivered: 14

Research Work Presented in Conference/Symposium/Seminars/Workshops: 22

Attended Meeting/Online courses/Training Programme: 25

Member of Editorial Board: 1. American Journal of Nanosciences (Science Publishing Group), 2. Review Editor on the Editorial Board of Dielectric Materials (specialty section of Frontiers in Electronic Materials)

Reviewer: 1. **Sustainable Energy & Fuels (The Royal Society of Chemistry)**, 2. **Solar Energy Materials and Solar Cells (Elsevier)**, 3. Materials Research Bulletin (Elsevier), 4. Open Journal of Applied Sciences (Scientific Research) 5. Materials Today: Proceedings Journal (Elsevier), 6. Journal of Nanostructures, 7. Journal of Electronic Material (Springer), 8. Progress in Color, Colorants and Coatings, 9. Materials (MDPI), 10. (Wiley)

Research/Review Papers Published in International Journals:

1. Sonal Santosh Bagade, Piyush K. Patel, Salutary Impact of Spontaneous Oxidation in $\text{CH}_3\text{NH}_3\text{SnI}_3$ on CZTS-Based Solar Cell, **Scientific Report 15 (2025) 3056-3073**.
 2. Sonal Santosh Bagade, Piyush K. Patel, A Comprehensive Review on Potential of Diffusion Length Enhancement to Upraise Perovskite Solar Cell Performance, **Physica Scripta 99 (2024) 052003**.
 3. Sonal Santosh Bagade, M. M. Malik, Piyush K. Patel, The Charm of Entwining Two Major Competitors CZTS & $\text{CH}_3\text{NH}_3\text{SnI}_3$ to Feasibly Explore Photovoltaic World Beyond Shockley-Queisser Limit, **Surfaces and Interfaces 46 (2024) 104020**.
 4. Sonal Santosh Bagade, S. Patel, M. M. Malik, Piyush K. Patel, Establishment of Justified Parameter Optimization Sequence for obtaining Maximum Solar Cell Efficiency, **Physica Scripta 98 (2023) 105972**.
 5. Sonal Santosh Bagade, Piyush K. Patel, Insight into Conduction Band Density of States at c-Si/ TiO_2 Interface for Efficient Heterojunction Solar Cell, **Physica Scripta 98 (2023) 105958**.
 6. Sonal Santosh Bagade, Shashidhar Patel, M.M. Malik, Piyush K. Patel, Recent Advancements in Applications of Graphene to Attain Next-Level Solar Cells, **C-Journal of Carbon Research 9 (2023) 70**.
 7. Deepak Jha, Anamika Dixit, A. Sushrutha, Piyush K. Patel, Optical Simulations and Optimization of Highly Efficient GaAs based Quantum Dot Solar Cell, **Optics Communications 523 (2022) 128717**.
 8. Rangam Vamsi Krishna, Laxmi, Brahmadata Mahapatra, Piyush K. Patel, Effect of Electrical Parameters on lead-based Perovskite Solar Cell for High-Efficiency Performance, **Optical and Quantum Electronics 54 (2022) 513**.
 9. Brahmadata Mahapatra, Rangam Vamsi Krishna, Laxmi, Piyush K. Patel, Design and Optimization of $\text{CuSCN}/\text{CH}_3\text{NH}_3\text{PbI}_3/\text{TiO}_2$ Perovskite Solar Cell for Efficient Performance, **Optics Communications 504, 1 (2022) 127496**.
 10. Amit Kumar, Piyush K Patel, K L Yadav, Yogendra Singh, Naveen Kumar, Abdullah, G Sharma, Satyendra Singh, Enhanced magnetoelectric coupling response in hot pressed BiFeO_3 and polymer composite films: Effect of magnetic field on grain boundary and grain resistance, **Materials Research Bulletin 145 (2022) 111527**.
 11. Piyush K. Patel, Device Simulation of Highly Efficient Eco-Friendly $\text{CH}_3\text{NH}_3\text{SnI}_3$ Perovskite Solar Cell, **Scientific Report 11 (2021) 3082-3092**.
 12. Piyush K. Patel, Hemant Singh and K. L. Yadav, Enhancement of Dielectric Performance in $\text{BaZr}_{0.02}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.98}\text{O}_3$ Ceramics Influenced by Sintering Temperatures, **Physica B: Physics of Condensed Matter 617 (2021) 413114-413418**.
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13. Piyush Kumar Patel Jyoti Rani and K. L. Yadav, Effective Strategies for Reduced Dielectric Loss in Ceramic/ Polymer Nanocomposite Film, **Ceramic International** **47** (2021) **10096-10103**.
 14. Ayushi Katariya, Bhramadatta Mahapatra, Piyush K. Patel, Jyoti Rani, Optimization of ETM and HTM layer on NFA based BHJ-organic solar cell for high efficiency performance, **Optik** **245** (2021) **167717**.
 15. Laxman Mandal, Vidya, Balram Verma, Jyoti Rani, Piyush K. Patel, Progressive Advancement of ZnS-based Quantum dot LED, **Optical and Quantum Electronics** **53**, (2021) **10**.
 16. Jyoti Rani, Varun K. Kushwaha, Piyush K. Patel, C.V. Tomy, Exploring Magnetoelectric Coupling in Trilayer $[\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3-0.5(\text{Ba}_{0.7}\text{Ca}_{0.3})\text{TiO}_3]/\text{CoFe}_2\text{O}_4/[\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3-0.5(\text{Ba}_{0.7}\text{Ca}_{0.3})\text{TiO}_3]$ Thin Film, **Journal of Alloys and Compounds** **863** (2021) **157702**.
 17. Jyoti Rani, Varun K. Kushwaha, Piyush K. Patel and C.V. Tomy, Room temperature magnetoelectric properties of $[\text{Ba}(\text{Zr}_{0.2}\text{Ti}_{0.8})\text{O}_3-0.5(\text{Ba}_{0.7}\text{Ca}_{0.3})\text{TiO}_3]/\text{Ni}_{0.8}\text{Zn}_{0.2}\text{Fe}_2\text{O}_4$ bilayer thin films, **Materials Chemistry and Physics** **256** (2020) **123692-123699**.
 18. Piyush Kumar Patel and K. L. Yadav, Electrically Heterogeneous High Dielectric $\text{BaTi}_{0.4}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ Ceramic, **Solid-State Electronics** **132** (2017) **39-44**.
 19. K. L. Yadav and Piyush K. Patel, Bimodal distribution of grains Fractured surfaces, **Materials Today** **19**, **1** (2016) **56-57**. (Cover Article)
 20. Piyush Kumar Patel and K. L. Yadav, Dwell time effect on the barrier layer capacitor structure in $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ Ceramics, **Ceramics International** **41** (2015) **12386-12392**.
 21. Piyush Kumar Patel, K. L. Yadav and Shankar Dutta, Development of $\text{Ba}_{0.95}\text{Sr}_{0.05}\text{Fe}_{0.5}\text{Nb}_{0.5}\text{O}_3/\text{Poly}$ (vinylidene fluoride) Nanocomposites for Energy Storage, **Journal of Materials Science: Materials in Electronics** **26**, **6** (2015) **4165-4171**.
 22. Piyush Kumar Patel, K. L. Yadav and Gurpreet Kaur, Reduced Dielectric Loss in $\text{Ba}_{0.95}\text{Sr}_{0.05}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ Thin Film Grown by Pulsed Laser Deposition, **RSC Advances** **4** (2014) **28056-28061**.
 23. Piyush Kumar Patel, K. L. Yadav, Harishchandra Singh and A. K. Yadav, Origin of giant dielectric constant and magnetodielectric study in $\text{Ba}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ nanoceramics, **Journal of Alloys and Compounds** **591** (2014) **224-229**.
 24. Piyush Kumar Patel and K. L. Yadav, Extrinsic Mechanism for Colossal Dielectric Constant in $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ Ceramics Evidenced by Nanodomain, **Materials Research Express** **1** (2014) **015037**.
 25. Piyush Kumar Patel and K. L. Yadav, Giant barrier layer capacitance effect in lead free $\text{Ba}_{0.95}\text{Sr}_{0.05}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3\text{-BaZr}_{0.1}\text{Ti}_{0.9}\text{O}_3$ nanoceramics, **Physica B: Condensed Matter**, **452** (2014) **136-141**.
 26. Piyush Kumar Patel and K. L. Yadav, Effect of Yttrium on Microstructural, Dielectric, Ferroelectric and Optical Properties of $\text{BaZr}_{0.10}\text{Ti}_{0.90}\text{O}_3$ Nanoceramics, **Physica B: Condensed Matter**, **442** (2014) **39-43**.
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27. Jyoti Rani, Piyush Kumar Patel, Nidhi Adhlakha, Hemant Singh, K. L. Yadav and Satya Prakash Mo⁺⁶ Modified (K_{0.5}Na_{0.5})NbO₃ lead free ceramics: Strutural, Electrical and Optical properties, **Journal of Materials Science and Technology** 30, 5 (2014) 459-465.
28. Piyush Kumar Patel and K. L. Yadav, Giant dielectric permittivity and room temperature magnetodielectric study of BaTi_{0.2}(Fe_{0.5}Nb_{0.5})_{0.8}O₃ nanoceramic, **Materials Research Bulletin** 48, 4 (2013) 1435-1438.
29. Piyush Kumar Patel, Jyoti Rani, Nidhi Adhlakha, Hemant Singh and K. L. Yadav, Enhanced Dielectric Properties of Doped Barium Titanate Ceramics, **Journal of Physics and chemistry of solids**. 74, 4 (2013) 545-549.
30. Piyush Kumar Patel and K. L. Yadav, Study of Barrier Layer Effect in Sr Doped Barium Iron Niobate Ceramics, **Science of Advanced Materials**, 5 (2013) 891-895.
31. Nidhi Adhlakha, K.L. Yadav, Amit Kumar, Piyush Kumar Patel, Jyoti Rani and Meera Rawat, Structural, optical and magnetic study of (1-x)ZnO-xMgO composite prepared through solid state reaction method, **Physica B: Condensed Matter** 407 (2012) 3427-3433.
32. Meera Rawat, K. L. Yadav, Amit Kumar, Piyush Kumar Patel, Nidhi Adhlakha, Jyoti Rani, Structural, dielectric and conductivity properties of Ba²⁺ doped (Bi_{0.5}Na_{0.5}TiO₃) ceramics, **Advanced Material Letter** 3, 4 (2012) 286-292. (Scopus upto 2016)

Book Chapter:

1. Sonal Santosh Bagade, M.M. Malik, Piyush K. Patel, Optical Coating Systems for High-Efficiency Solar Cells, Functional Coatings : Innovations and Challenges, John Wiley & Sons, Inc., NJ, USA (Scopus Indexed) (Accepted, June 2023).
ISBN-10: 1394207271
ISBN-13: 978-1394207275
 2. Sudhansubhusan Barik, Sonal Santosh Bagade, Piyush K. Patel, Recent Trends in Carbon Nanofillers and Its Fabrication, (Scopus Indexed).
Book: Handbook of Nanofillers.
DOI : 10.1007/978-981-99-3516-1
 3. Piyush Kumar Patel and Vidya, Study on CNT Based Nano-Composites: An Introduction, Mechanism and Finite Element Analysis, Handbook on Carbon Nanotube, Springer (Accepted, July 2021) (<https://doi.org/10.1007/978-3-319-70614-6>)
ISBN No. 978-3030913458
 4. Sonal Santosh Bagade, Surendar, Sudhansubhusan Barik, Aravind Kumar, M. M. Malik, Piyush K. Patel "A Holistic Review on Various Innovative Strategies using DFT Modelling Technology to obtain Highly Efficient Solar Cells." Springer (Submission ID: ICET330) (Accepted, April 2023). Event: International Conference on Innovations in Clean Energy Technologies (ICET2023) (8th to 10th April 2023) (Offline mode).
Springer Proceedings in Energy (ISBN/ISSN No. 2352-2542/2352-2534)
 5. Sudhansubhusan Barik, Pooja Patidar, Sonal Santosh Bagade, Surendar and Piyush K. Patel "Recent Advances in Solid State Storage of Hydrogen Energy" Springer (Submission ID: ICET346) (Accepted Manuscript). Event: International Conference on Innovations in Clean Energy Technologies (ICET2023) (8th-10th April 2023) (Offline mode).
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Springer Proceedings in Energy (ISBN/ISSN No. 2352-2542/2352-2534)

6. Surendar, Sonal Santosh Bagade, Sudhansubhusan Barik, Aravind Kumar and Piyush K. Patel. "Performance Enhancement of GaAs/CIGS/InP Quantum Dot Solar Cell by Hole Transport Layer Optimization." Springer (2023) (Submission ID: ICET373) (Accepted manuscript). Event: International Conference on Innovations in Clean Energy Technologies (ICET2023) (8th to 10th April 2023) (Offline mode).
Springer Proceedings in Energy (ISBN/ISSN No. 2352-2542/2352-2534)
7. Aravind Kumar, Sonal Santosh Bagade, Sudhansubhusan Barik, Patel, Krishna Kumar, Jyoti Rani, and Piyush K. Patel "Study of Super-Hydrophobic Surface of Materials" Springer (2023) (Accepted) Event: International Conference on Innovations in Clean Energy Technologies (ICET2023) (8th to 10th April 2023) (Offline mode)
Springer Proceedings in Energy (ISBN/ISSN No. 2352-2542/2352-2534)
8. Anuj Raskatla, Jyoti Rani and Piyush K. Patel "Photo Thermal Therapy of Tumor Tissue by Gold Nanoparticles", (Scopus Indexed)
Book: Advances in Clean Energy Technologies
DOI : 10.1007/978-981-96-0009-0.

Research Papers published in Conference/Symposium/Proceeding (Scopus based Journals):

1. Supriya Takkar, Piyush K. Patel, Sodium Titanate Microsphere for Sodium Ion Batteries, International Conference on Advanced Materials and Technologies, International Conference on Advanced Materials and Technologies held during 28 Feb – 02 March, 2025 organised by Department of Materials and Metallurgical Engineering, Maulana Azad National Institute of Technology.
 2. Harsh Goyal, Shubhchintak Sharma, Piyush K. Patel, Stellar Solutions for Cosmic Lithium Problem, International Conference on Advanced Materials and Technologies, International Conference on Advanced Materials and Technologies, International Conference on Advanced Materials and Technologies held during 28 Feb – 02 March, 2025 organised by Department of Materials and Metallurgical Engineering, Maulana Azad National Institute of Technology.
 3. Tanishq Sarda, Shivi Mishra, Piyush K. Patel. A Comprehensive Review on the Advancement of Perovskite Solar Cells (Accepted in Conference).
 4. Sonal Santosh Bagade, Sudhansu B Barik, MM Malik, Piyush K Patel, Impact of band alignment at interfaces in perovskite-based solar cell devices, **Materials Today Proceeding** (<https://doi.org/10.1016/j.matpr.2023.02.117>).
 5. Sudhansu B Barik, Pooja Patidar, Sonal Santosh Bagade, Aravind Kumar, RK Nayak, Piyush K Patel, Recent progress in reinforcement of nanofillers in epoxy-based nanocomposites, **Materials Today Proceeding** (<https://doi.org/10.1016/j.matpr.2023.03.116>).
 6. Rangam Vamsi Krishna, Laxmi, Brahmadata Mahapatra, Piyush K. Patel, Device Simulation of $\text{CH}_3\text{NH}_3\text{PbI}_3$ Perovskite Solar Cell with High Efficiency, **AIP Conference Proceedings 2352, 020066 (2021)**.
 7. Krishna Kumar Patel, Piyush K. Patel, M. M. Malik, A Review of Nanotechnology Based Highly Sensitive IoT Capable Sensing Device, **AIP Conference Proceedings 2352, 040025 (2021)**.
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8. Laxmi, B. Mahapatra, R.V. Krishna, P.K. Patel, A Review on Recent Advancements in Graphene Based Field-Effect Transistor Biosensors, **AIP Conference Proceedings** 2327, 020011 (2021).
9. B. Mahapatra, K.K. Patel, Vidya, P.K. Patel, A review on recent advancement in materials for Piezoelectric/ Triboelectric Nanogenerators, **Materials Today: Proceedings** 46 (2021) 5523–5529.
10. Vidya, L. Mandal, B. Verma, P. K. Patel, Review on Polymer nanocomposite for Ballistic & Aerospace Applications, **Materials Today Proceeding** 26(2) (2020) 3161-3166.
11. Piyush Kumar Patel, K.L. Yadav and Durgesh, Extrinsic mechanism for giant dielectric response in $\text{Ba}_{0.70}\text{Sr}_{0.30}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ Ceramic, **AIP Conf. Proc.** 1591, 540 (2014); doi: 10.1063/1.4872667.
12. Piyush Kumar Patel, Jyoti Rani and K.L. Yadav, Crystal structure analysis of lead free $\text{Ba}_{1-x}\text{La}_x[\text{Ti}_{0.5}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.5}]_{1-x/4}\text{O}_3$ Ceramics, **AIP Conf. Proc.** 1447, 515 (2012); doi: 10.1063/1.4710105.
13. Amit Kumar, K. L. Yadav, Piyush Kumar Patel, Jyoti Rani, Nidhi Adhlakha, Meera Rawat and Hemant Singh, Magnetocapacitance and Magnetic Properties of Cr^{3+} Ions Doped Hematite Prepared by Sol-Gel Method at Room Temperature, **IEEE conference, Nanoscience, Technology and Societal Implications (NSTSI), 2011; doi:10.1109/NSTSI.2011.6111789.**

Research Work Presented in Conferences/Seminars/Symposium/Workshop:

1. Work entitled “Sodium Titanate Microsphere for Sodium Ion Batteries, International Conference on Advanced Materials and Technologies”, International Conference on Advanced Materials and Technologies held during 28 Feb – 02 March, 2025 organised by Department of Materials and Metallurgical Engineering, Maulana Azad National Institute of Technology.
 2. Work entitled “Stellar Solutions for Cosmic Lithium Problem”, International Conference on Advanced Materials and Technologies, International Conference on Advanced Materials and Technologies, International Conference on Advanced Materials and Technologies held during 28 Feb – 02 March, 2025 organised by Department of Materials and Metallurgical Engineering, Maulana Azad National Institute of Technology.
 3. Work entitled “A Comprehensive Review on the Advancement of Perovskite Solar Cells”.
 4. Work entitled “Impact of band Alignment at Interfaces in Perovskite-based Solar Cell Devices” on 2nd International Conference on “Advancements in Material Science and Technology – iCAM 2022” held during November 02 - 04, 2022 jointly organized by Satyabhama Institute of Science and Technology, Chennai, India in association with Alexander Dubcek University of Trencin, Slovakia.
 5. Work entitled “Recent progress in reinforcement of nanofillers in epoxy-based nanocomposites” on 2nd International Conference on “Advancements in Material Science and Technology – iCAM 2022” held during November 02 - 04, 2022 jointly organized by Satyabhama Institute of Science and Technology, Chennai, India in association with Alexander Dubcek University of Trencin, Slovakia.
 6. Work entitled “Device Simulation of $\text{CH}_3\text{NH}_3\text{PbI}_3$ Perovskite Solar Cell with High Efficiency” was presented (oral) in “5th National e-Conference on Advanced Materials and Radiation Physics
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(AMRP-2020)” held during 09-11, Nov. 2020 at Sant Longowal Institute of Engineering and Technology, Longowal, Sangrur, Punjab.

7. Work entitled “A Review of Nanotechnology Based Highly Sensitive IoT Capable Sensing Device” was presented (oral) in “5th National e-Conference on Advanced Materials and Radiation Physics (AMRP-2020)” held during 09-11, Nov. 2020 at Sant Longowal Institute of Engineering and Technology, Longowal, Sangrur, Punjab.
 8. Work entitled “A Review on Recent Advancements in Graphene Based Field-Effect Transistor Biosensors” was presented (oral) in “2nd International Conference on Material Science, Smart Structures and Applications (ICMSS 2020)” held during 15-16, Oct. 2020 at Surya engineering college, Erode, India.
 9. Work entitled “A review on recent advancement in materials for Piezoelectric/ Triboelectric Nanogenerators” was presented (oral) in “International Conference on Innovations in Clean Energy Technologies (ICET 2020)” held during 27-28, Aug. 2020 at Maulana Azad National Institute of Technology Bhopal.
 10. Work entitled “Review on Polymer nanocomposite for Ballistic & Aerospace Applications” was presented (oral) in “10th International Conference on Materials, Processing & Characterization” held during 15-17, Dec. 2020 at Department of Mechanical Engineering, GLA University, Mathura.
 11. Work entitled “Over – Damped Motion” was presented (poster) in “5th IAPT National Student Symposium on Physics, Indian Association of Physics Teachers” held during 10-12, Nov. 2017 at Department of Physics, Panjab University, Chandigarh.
 12. Poster entitled “Influence of Ba(Fe_{0.5}Nb_{0.5})O₃ Nanoceramic on MWCNT Reinforced PVDF Nanocomposite” and “Dielectric and Ferroelectric Studies of Sol-gel Derived Zr-Doped BaTiO₃ Ceramics” was presented in “19th National Seminars on Ferroelectrics & Dielectrics” held during Dec. 19-21, 2016 at Department of Physics, Maulana Azad National Institute of Technology Bhopal, India.
 13. Participated in “National Conference on Nano Devices: Modeling Simulation and Fabrication” held during April 18-19, 2015 at Hindustan College of Science and Technology, India.
 14. Work entitled “Novel Ba_{0.70}Sr_{0.30}(Fe_{0.5}Nb_{0.5})O₃ ceramics for giant dielectric and magnetodielectric response” was presented (talk) in “**Materials Today Asia conference**” held during 9-12, Dec 2014 at **City University, Hong Kong**.
 15. Poster entitled "Magnetoelectric coupling and electrical properties of CoFe₂O₄ added 0.5Ba(Zr_{0.2}Ti_{0.8})O₃-0.5(Ba_{0.7}Ca_{0.3})TiO₃ ceramics" was presented in “India Roadshow and Symposium Series: Supramolecular chemistry symposium” held during 4th November 2014 at Indian Institute of Technology Delhi, India.
 16. Work entitled “Structural and Dielectric Investigation on Grain Growth-Controlled Giant Permittivity in Chemically Modified Perovskite Ceramics” was presented (talk) in “National Conference on Materials Science and Technology” held during 10-11, March 2014 at M.M.M. Engineering College, Gorakhpur.
 17. Has participated in IEEE Electron Device Society mini-colloquium on “Nanoscale device physics and reliability” held during 19th September 2014 at Department of Electronics and Communication Engineering, IIT Roorkee, India.
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18. Poster entitled “Extrinsic Mechanism for Giant Dielectric response in $\text{Ba}_{0.70}\text{Sr}_{0.30}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ Ceramic” was presented in “58th DAE Solid State Physics Symposium” held during Dec. 17-21, 2013 at Thapar University, Patiala, India.
19. Poster entitled “Effect of Substrate Temperature on Structural, Optical and Electrical properties of $\text{Ba}_{0.95}\text{Sr}_{0.05}(\text{Fe}_{0.5}\text{Nb}_{0.5})\text{O}_3$ thin film grown by Pulse Laser Deposition” was presented in “**12th International Conference on Atomically Controlled Surfaces, Interfaces and Nanostructures in conjunction with 21st International Colloquium on Scanning Probe Microscopy (ACSIN-12 & ICSPM21)**” held during Nov. 4-8, 2013 at **Tsukuba International Congress Center, Japan.**
20. Seminar given on “Lead free dielectric ceramic” on 22nd February, 2013 at Department of Physics of Indian Institute of Technology Roorkee under Indian Physics Association (IPA) Roorkee Chapter.
21. Poster entitled “Dielectric and magnetodielectric study of $\text{BaTi}_{0.4}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.6}\text{O}_3$ nanoceramic” was presented in “17th National Seminars on Ferroelectrics & Dielectrics (NSFD-2012)” held during Dec. 17-19, 2012 at Institute of Technical Education & Research, Shiksha ‘O’ Anushandhan University, India.
22. Poster entitled “Dielectric, Ferroelectric and Impedance studies on $\text{BaTi}_{0.2}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.8}\text{O}_3$ ceramic” was presented in “International Conference on Advances in Materials and Processing: Challenges and opportunities (AMPCO 2012)” held during Nov. 2-4, 2012 at Department of metallurgical and Materials Engineering, Indian Institute of Technology Roorkee, Roorkee, India.
23. Poster entitled “Enhanced Dielectric Responses in BFN Ceramics” was presented in “International Conference and Workshop on Nanostructured Ceramics and other Nanomaterials (ICWNCN)” (a) workshop held on March 13, 2012 and (b) conference held during March 14-16, 2012 at Department of Physics and Astrophysics, University of Delhi, Delhi, India.
24. Poster entitled “Effect of Sintering Temperature on the Dielectric Property of BFN Ceramic” was presented in “National Conference on Advances in Physics (NCAP)” held during Feb. 25-26, 2012 at Department of Physics, Indian Institute of Technology Roorkee, India.
25. Poster entitled “Crystal Structure Analysis of Lead Free $\text{Ba}_{1-x}\text{La}_x[\text{Ti}_{0.5}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.5}]_{1-x/4}\text{O}_3$ Ceramics” was presented in “56th DAE Solid State Physics Symposium” held during Dec. 19-23, 2011 at SRM University, Kattankulathur, Tamilnadu, India.
26. Poster entitled “Structural and Electrical Properties of Double Doped PZT Ceramics” was presented in “Experimental tools for material science research: State of Art” held during Dec. 3-4, 2010 at Banaras Hindu University, Varanasi, India.
27. Poster entitled “Effect of Calcination Temperature on Magnetic Properties of Cr doped Hematite Prepared by Sol Gel method” was presented in “International workshop and symposium on the synthesis and characterization of glass/ glass ceramics (IWSSCGGC- 2010)” held during July 9-10, 2010 at Centre for Materials for Electronics Technology, Pune.

Attended Meeting/ Training Programme:

1. Participated in "Science Communication Outreach & Public Engagement" a Capacitive Building Workshop on Science Communication for STEM faculty under the aegis of Malaviya Mission Teacher Training Programme (MMTTP), Ministry of Education, Government of India organized
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by IIT Hyderabad in association with Indian National Young Academy of Science (INYAS), New Delhi) held during March 1-5, 2025 at IIT Hyderabad.

2. Participated in online Distinguished Webinar Series on "Nanotechnology Enabled Memristive Devices and Systems for Neuromorphic Computation and its Associate Applications" held during 08 Nov, 2021 to 25 Nov, 2021 organized by IEEE Nanotechnology Council (NTC) Student Branch Chapter, IIT Indore, India., Capacitive Building workshop at IIT Hyderabad
 3. NITTTR
 4. Theme based webinars
 5. IIT Kanpur, HCV
 6. Participated in a webinar on "Atomistic Modelling and Simulation of Materials (AMSM-2021)" held during 30-31 May, 2021 organized by I.I.T. Kharagpur.
 7. Participated in a Hands-on session "Pilot workshop on Gnuplot" held on 22 May, 2021 organized by I.I.T. Bombay.
 8. Participated in online workshop on "Hands-on training on designing of Tandem solar cell using SCAPS-1D" held during 11 Jan, 2021 to 13 Jan, 2021 organized by VLSI Centre of Excellence, Chitkara University Research and Innovation Network, Chitkara University, Punjab, India.
 9. Participated in Short term course on "An Introductory Workshop on Physics Virtual Lab" held on December 08, 2020 organized by Department of Physics, The National Institute of Engineering, Mysuru-570008, Karnataka.
 10. Participated in Short term course on "one-week TEQIP-III sponsored short-term course on the topic "Basic Principles of DFT Calculations and Molecular Dynamics Simulations" held during November 23 -27, 2020 organized by Department of Chemical Engineering, Malaviya National Institute of Technology, Jaipur, Rajasthan.
 11. Participated in Short term course on e-STC on "Modeling and Simulation for Transport Processes (MSTP-2020)" held during November 04 -08, 2020 organized by Department of Chemical Engineering, N.I.T. Hamirpur, Himachal Pradesh.
 12. Participated in Short term course on "Current Trends in Condensed Matter Physics (CTCMP)"-2020 held during September 25 -29, 2020 organized by Department of Physics, Dr. B.R. Ambedkar National Institute of Technology, Jalandhar.
 13. Participated in online workshop on Rietveld Refinement Method organized by UGC-DAE Consortium for Scientific Research Mumbai Centre in association with Indore Centre September 22 -24, 2020.
 14. Participated in online workshop on Solar Cell Simulation using Open-source TCAD Software (SCAPS- 1D) held during 22 July, 2020 to 25 July, 2020 organized by VLSI Centre of Excellence, Chitkara University Research and Innovation Network, Chitkara University, Punjab, India.
 15. Participated in the online GEM training programm held during 18 June, 2020 to 19 June, 2020 organized by Maulana Azad National Institute of Technolohgy Bhopal.
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16. Participated in the one-week STTP on Recent Trends in Research Methodology held during 25 May, 2020 to 29 May, 2020 organized by REST Society for Research International (RSRI), Krishnagiri, Tamil Nadu, India.
17. Participated in the online course Learning Physics Through Simple Experiments held during 02 April, 2020 to 10 June, 2020 organized by Prof. H. C. Verma (Retd.), I.I.T. Kanpur.
18. Participated in the online course Advanced Course on Special theory of Relativity held during 26 January, 2020 to 19 May, 2020 organized by Prof. H. C. Verma (Retd.), I.I.T. Kanpur.
19. Participated in the online course Basics of Quantum Mechanics held during 15 August 2019 to November 18, 2019 organized by Prof. H. C. Verma (Retd.), I.I.T. Kanpur.
20. Participated in the online course Basics of Special Theory of Relativity held during 18 Dec 2018 to 8 Mar 2019 organized by Prof. H. C. Verma (Retd.), I.I.T. Kanpur.
21. Attended one-week training program with the theme "National Workshop of Utsahi Physics Teachers" held during 20-05-2018 to 25-05-2018 at Shiksha Sopan Ashram, Kanpur.
22. Attended one-week training program with the theme "One Week Training Program on Computer Interfaced Science Experiments" held during 30-April-2018 to 5-May-2018 at Inter - University Accelerator Centre, New Delhi.
23. Participated in "Short Term Course on Advanced Spectroscopic Tools for Materials Characterization (ASTMC- 2017) organized by Departments of Materials Science and Metallurgical Engineering, Maulana Azad National Institute of Technology, Bhopal, during June 12-22, 2017.
24. Participated in one-week short term training program on "IP Procedure, Patent Drafting and Commercialization" held during 15-19 October, 2016 at Department of Humanities and Social Sciences, Maulana Azad National Institute of Technology Bhopal, India.
25. Participated in "Short Term Training Program on Cloud Computing" held during March 28-29, 2015 at Department of Mathematics and Computer Applications, Maulana Azad National Institute of Technology Bhopal, India.
26. "4th Interaction meeting on Synchrotron Utilization with the theme: "Structure determination using X-ray Diffraction" held during July 23-25, 2012 at Training School Auditorium Raza Ramanna Centre for Advanced Technology, Indore.

Organised National Workshop:

1. Organized 6 days hybrid mode (offline/online) STTP as a coordinator entitled "2nd Summer Short-Term Training Course on X-ray Diffraction: Theory, Methods and Workflow (XRD 2024)" held during 8– 13th July, 2024 at Department of MME in the collaboration of Department of Physics, Maulana Azad National Institute of Technology Bhopal.
 2. Organized two-week online STTP as a coordinator entitled "Online Short-Term Training Course on X-ray Diffraction: Theory, Methods and Workflow (XRD 2021)" held during 6– 15th September, 2021 in the collaboration of Department of Physics, Maulana Azad National Institute of Technology Bhopal.
 3. Organized one-week online STTP as a coordinator entitled "Advanced Methods of Material Characterization and Surface Analysis" held during 27 February, 2021 to 03 March, 2021 at Department of Physics in the collaboration of Department of Chemistry and Chemical Engineering, Maulana Azad National Institute of Technology Bhopal.
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4. Organized one-week national workshop as a coordinator entitled National Workshop on “Emerging Technologies for Synthesis and Characterization of Nanostructured Materials” held during 02 December, 2019 to 06 December, 2019 at Department of Physics, Maulana Azad National Institute of Technology Bhopal.

Expert Lecture/ Talk Delivered:

1. Talk delivered on “Revealing the Impact of Energy Band Alignment at Interfaces in Solar Cell Devices” as invited expert speaker on 27th May 2025 in a faculty development programme on “Advanced Energy Materials for Sustainable Energies”, in online mode. It has been organised by EICT Academy sponsored at PDPM IITDM Jabalpur from May 26 - 31, 2025.
 2. Talk delivered on “Impact of Energy Level Alignment at Interfaces on Efficiency in Solar Cell Devices” as invited speaker on 26th April 2025 at IIT Indore. It has been organised by IEEE Nanotechnology Council Student Chapter, Indian Institute of Technology Indore.
 3. Talk delivered on “Influence of Band Alignment at Interfaces in Solar Cell Devices” as invited speaker on 31st May 2024 in a High-End Workshop entitled “Advanced Energy Materials for Next-Generation Solar Cells”. It has been organised by SERB-DST at PDPM IITDM Jabalpur under the KARYASHALA Scheme from May 27 - June 02, 2024.
 4. Talk delivered online on “Impact of Defects and Work Function of Electrode in Solar Cell Devices” in World congress on Materials Science Research and Nanotechnology (May 22-23, 2023) as invited speaker on 22nd May 2023 organised at Rome, Italy.
 5. Talk delivered online on “Influences of Local Electric Field at Interfaces in Solar Cell Devices” in 5th Virtual Congress on Materials Science & Engineering (September 26, 2022- September 29, 2022) as invited speaker on 29th September 2022 organised by Mind Authors, Inc., USA.
 6. Talk delivered online on “Device Simulation of Highly Efficient Eco-Friendly Solar Cell” in International Online Conference on Materials Science and Technology (ICMT-2021) (Nov 11, 2021- Nov 13, 2021) as invited speaker on 13th Nov 2021 organised by Mahatma Gandhi University, P.D Hills P.O, Kottayam Kerala, India & Gdansk University of Technology, Gdansk, Poland & Wroclaw University of Technology, Wroclaw, Poland.
 7. Talk delivered online on “Device Simulation of Highly Efficient Eco-Friendly Solar Cell” in Graphene Summit 2021 entitled “Global Virtual Summit on Carbon, Graphene, 0D, 1D, and 2D materials” with theme “Contemporary Innovations and Emerging Novel Research in Catalysis and Chemical Engineering” (July 22, 2021- July 23, 2021) as invited speaker on 23rd July 2021 organised by Mind Authors, Inc., USA.
 8. Talk delivered online on “Materials Under Electric field” in 7 days Workshop entitled “Research Methodology for Multidisciplinary Perspective of Physics” (June 29, 2021- July 05, 2021) as invited speaker, 3rd July 2021 organised by Department of Physics, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur.
 9. Talk delivered online on “Complex Impedance analysis: A potential tool for characterization” in an International Conference and Exhibition on Materials and Engineering (ICEME-2021) (8-10 June 2021) as invited speaker on 8th June, 2021 organised by Helix Group Scientific Network in association with ICEME leadership committee at Seoul, South Korea.
 10. Talk delivered online on “Characterization Techniques” in an International Conference on Recent Trends in Science (ICRAS-2021) (30 April-01 May 2021) as invited speaker, 1st May
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2021 organised by Department of Applied Science and Humanities, Faculty of Science, Invertis University, Bareilly.

11. Talk delivered online on “Principle and Applications of Impedance Spectroscopy” in an online Short Term Training Program on Advanced Methods of Material Characterization and Surface Analysis, March 2021 organised by Department of Physics, Maulana Azad National Institute of Technology Bhopal
12. Talk delivered online on “Electrically heterogeneous materials” in an online Short Term Training Program on Synthesis and Characterization of Advanced Materials (SCAM - 2020), Nov 2020 organised by Department of Chemical Engineering and Department of Materials & Metallurgical Engineering Maulana Azad National Institute of Technology Bhopal
13. Talk delivered on “Impedance Spectroscopy” in one-week national workshop on “Emerging Technologies for Synthesis and Characterization of Nanostructured Materials” held during 02 December, 2019 to 06 December, 2019 at Department of Physics, Maulana Azad National Institute of Technology Bhopal.
14. Talk delivered on “How to crack CSIR-JRF NET Exam?” at Department of Physics, Vardhaman College, Bijnor
15. Talk delivered on “Dielectric Materials” under Indian Physics Association, IIT Roorkee Chapter at Department of Physics, IIT Roorkee.

Outreach Activity:

1. One of the members as subject expert for PAT-2025 (11 August, 2025) at Professional Examination Board, Bhopal.
 2. One of the members as subject expert for ADDET-2025 (27 June, 2025) at Professional Examination Board, Bhopal.
 3. Participated in "Science Communication Outreach & Public Engagement" a Capacitive Building Workshop on Science Communication for STEM faculty under the aegis of Malaviya Mission Teacher Training Programme (MMTTP), Ministry of Education, Government of India organized by IIT Hyderabad in association with Indian National Young Academy of Science (INAYAS), New Delhi) held during March 1-5, 2025 at IIT Hyderabad.
 4. One of the members as subject expert for ANMTST-2024 (03-04 Oct, 2024) at Professional Examination Board, Bhopal.
 5. One of the members as subject expert for PNST-2024 and GNMTST-2024(18-19 Sept, 2024) at Professional Examination Board, Bhopal.
 6. Practical viva Nanotechnology M. Tech. students (RGPV, July 2024)
 7. Session Chair in the 2nd International Conference on Innovations in Clean Energy Technology (ICET 2023) held on 8th – 10th April 2023 organised by Energy Centre, Maulana Azad national Institute of Technology Bhopal, M.P..
 8. Practical viva Nanotechnology M. Tech. students (RGPV, August 2023)
 9. Practical viva Nanotechnology M. Tech. students (RGPV, 2022)
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10. Participated in 2nd International Conference on Innovations in Clean Energy Technology (8-10 April, 2023) as a Session chair on 9th April, 2023 organised by Energy Centre MANIT Bhopal.
11. One of the members as key setting subject expert for PCRT exam 2020 at Professional Examination Board, Bhopal (March 02-05, 2022).
12. One of the members as key setting subject expert for PCRT exam 2020 at Professional Examination Board, Bhopal (November 02, 2022).

Internship Hosted:

S. No.	Student Name & Course	Parent Institute of Student	Title of the Project Work	Month & Year
1.	Devashish Arora, Second year UG student in Integrated M. Sc. programme	National Institute of Technology, Rourkela	Device Simulation on Perovskite Solar Cell	01-30 June, 2025

M. Sc. Dissertation Completed/ continuing (2021-2025):

S. No.	Student	Title	Awarded
1.	Sonal Santosh Bagade	Modelling & Optimization of Novel Solar Cell Device	May 2023
2.	Sudhansubhusan Barik	Study of Structural and Mechanical Properties of MWCNT reinforced Epoxy nanocomposite	May 2023
3.	Surendar	Numerical Simulation of CIGS based Quantum Dot Solar Cell	May 2023
4.	Vineet Kumar	Diversity in the Motility Features of Flagella with Different Lengths	July 2024
5.	Nitin Paliwal	Comparative Roughness Study of Medical Implants Using Optical and Stylus Method	July 2024
6.	Neeraj Singh	Dynamics of Bell and GHz States in Noisy Channels	July 2024
7.	Supriya Takkar	Numerical Analysis of Germanium Based Lead-Free Perovskite Solar Cells For Enhanced Photovoltaic Performance	July 2025
8.	Harsh Goyal	Astrophysical S-Factor for $^{12}\text{C}(p, \gamma)^{13}\text{N}$ within the Potential Model framework	July 2025

M. Tech. Dissertation Completed (2019-2023):

S. No.	Student	Title	Awarded
1.	Laxman Mandal	Study of Structural, Optical and Electrical Properties of II-VI Semiconductor for Quantum Dot Light-Emitting Diode	June, 2020
2.	Balram Verma	Study of Metal Halides Perovskite Quantum Dot Light-Emitting Diode	June, 2020
3.	Vidya	Finite Element Modelling of Polymer Nanocomposite for Ballistic & Aerospace Applications	June, 2020
4.	Brahmadutta Mahapatra	Design and Simulation of CuSCN/CH ₃ NH ₃ PbI ₃ /TiO ₂ Perovskite Solar Cell for Efficient Performance	June, 2021
5.	Laxmi	Device Simulation of Highly Efficient Heterojunction Solar Cell	June, 2021
6.	Rangam Vamsi Krishna	Modeling and Performance analysis of Perovskite Solar Cells	June, 2021
7.	Deepak Jha	Optical Simulation and Optimization of Highly Efficient GaAs based Solar cell	May 2022
8.	Anamika Dixit	Enhanced Power Conversion Efficiency of Al-BSF c-Si Solar Cell	May 2022
9.	A. Sushrutha	Design and Simulation of CuI/CH ₃ NH ₃ SnI ₃ /TiO ₂ Perovskite Solar Cell for Efficient Performance	May 2022
10.	Anuj Raskatla	Photo Thermal Therapy of Tumor Tissue by Gold Nanoparticles	May 2023

Ph.D. Thesis Details (2020):

S. No.	Student	Title
1.	Krishna Kumar Patel	Synthesis and Characterization of Piezoelectric Nano Composite for Energy Harvesting Applications
2.	Arvind Kumar	Study of Structural, optical and Transport Properties of Transition Metal Oxide

ICME:

Speaker and member of organizing committee

Outstanding Research Work:

1. One of our article titled "Salutary impact of spontaneous oxidation in $\text{CH}_3\text{NH}_3\text{SnI}_3$ on CZTS-based solar cell" has been nominated and recognized for its outstanding contribution and is being considered for a feature in our next the Science Featured Series on sciencefeatured.com
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