


Faculty Profile: For University Website

DEPARTMENT OF PHYSICS

Personal Information	<p>Dr. Avijit Ghosh Department of Physics Mobile: 9801070687 Email Id: avijitphy@gmail.com Orcid id: 0000-0001-7842-7512 Vidwan ID: 108463 GoogleScholar: https://scholar.google.com/citations?user=xj0RFacAAAAJ&hl=en</p>	
Educational Qualification:	<ul style="list-style-type: none"> • Ph. D. (2010), Indian Institute of Technology, Kharagpur, W. B., India 	
Courses Taught:	<p>Ph.D. course work: Quantum Theory of Solids Characterization Techniques</p> <p>For M.Sc. students: Classical Electrodynamics Statistical Mechanics Quantum Mechanics Atomic and Molecular Physics Condensed Matter Physics Relativistic Quantum Mechanics Mathematical Physics</p> <p>For B.Sc. students: Heat Thermodynamics Optics Solid State Physics Nanoscience Electricity and Magnetism Quantum Physics Special Theory of Relativity Modern Physics Mathematical Physics-1</p> <p>For B. Tech. students: Introductory Physics</p>	

Additional role/ responsibility:	Not Applicable.
Professional /Administrative Experience:	<ul style="list-style-type: none"> ➤ As an <i>Assistant Professor</i>, Department of Physics, Central University of Jharkhand, Ranchi, Jharkhand, India (28.06.11 to till date). ➤ As a <i>Lecturer</i>, Department of Physics, IIIT-BASAR, Rajiv Gandhi University of Knowledge Technologies, Andhra Pradesh, India (30.09.10- 25.06.11). ➤ As an <i>Assistant Professor</i>, Department of Pure & Applied Physics, Guru Ghasidas Vishwavidyalay, Bilaspur, Chhattisgarh, India (19.07.10–21.09.10)
Awards & Honours	<ol style="list-style-type: none"> 1. Awarded <i>Focus Area Science Technology Summer Fellowship</i> funded by IASc (Indian Academy of Sciences)-INSA (Indian National Science Academy)-NASI (The National Academy Sciences, India) (University of Hyderabad, India) 2. Awarded <i>Erasmus Mundus LEADERS' scholarship on post-Doctorate level funded by European Union</i> (da Universidade do Porto, Portugal). 3. Awarded <i>CSIR-UGC Senior Research Fellowship</i> (Indian Institute of Technology Kharagpur, India). 4. Awarded <i>Institute Research Fellowship</i>, (Indian Institute of Technology Kharagpur, India). 5. Qualified <i>GATE</i> (Graduate Aptitude Test in Engineering) examination held on February 8, 2004 (<i>Percentile Score: 93.33, All India Rank: 185</i>) and February 13, 2005 (<i>Percentile Score: 98.09, All India Rank: 69</i>). 6. Qualified <i>NET</i> (National Eligibility Test) examination held on June 19 and with <i>CSIR-JRF</i> on December 18, 2005. 7. Qualified <i>SLET</i> (State Level Eligibility Test) (<i>UGC</i>) examination, West Bengal held on February 27, 2005. 8. Awarded the <i>University Gold Medal</i> for being <i>1st position in Master of Science</i> from Vidyasagar University, Midnapore, West Bengal, India in the year 2001-2002. 9. Awarded the <i>Janardan Ghorai Memorial Endowment Medal</i> for being <i>1st position in Master of Science</i> from Vidyasagar University, Midnapore, West Bengal, India in the year 2001-2002.
Research Area:	<ul style="list-style-type: none"> • Semiconductor Nanostructures, Multiferroics, Solid Oxide Fuel Cells, Photovoltaics, Nanogenerators
Research Guidance:	Ph. D.: 2 (Pursuing: 02), M. Sc. : 31 (Awarded: 29, Pursuing:02)
Brief introduction:	During the Ph.D. program, Avijit Ghosh studied the defects mediated optical properties of ZnO based nanostructures. After that he worked as a Lecturer at the department of Physics, Rajiv Gandhi University of Knowledge Technologies, Basar, Telangana, India. Since June 2011, he has been working as an Assistant Professor at the Department of Physics, Central University of Jharkhand. Ranchi, India. He has guided/guiding 31 master students for fulfillment of their dissertation and 2 Ph.D.

	<p>students are now working under his supervision. He has published/communicated more than 24 research articles and presented his research contribution in national/international conferences regularly. He is a reviewer of several international journals like Applied Physics A: Materials Science & Processing, Applied Physics Letters, Journal of Non-Crystalline Solids, Journal of Applied Physics, Nanotechnology, Philosophical Magazine, Physica Scripta, Journal of Raman Spectroscopy, etc. and a Life Member of Indian Association of Physics Teachers. He worked on the project of “Effective power generation through ZnO-based piezoelectric Nanowires” at departamento de Física e Astronomia, da Universidade do Porto, Portugal through Erasmus Mundus LEADERS’ scholarship program on Post-Doctorate level funded by European Union during 2017-2018. He was awarded Focus Area Science Technology Summer Fellowship funded by IASc (Indian Academy of Sciences)-INSA (Indian National Science Academy)-NASI (The National Academy of Sciences, India) (University of Hyderabad, India) in 2023. Recently, Dr. Ghosh acts as a Managing Guest Editor for Materials Today: Proceedings on CMDAYS-2021.</p>
Project (Completed/ Ongoing)	<p>1. Title of the project: <i>Investigation of Compositional Engineering for Efficient Perovskite Solar Cells</i> Agency: DST under Clean Energy Research Initiative (CERI) program Cost: 99.642 Lakh in 2016-2019. Role: Principal Investigator</p>
Patent	<p>NIL</p>
Articles Published/ Accepted:	<p>Total Publications (24)</p> <ol style="list-style-type: none"> 1. T. Patri, K.S.K.R. C. Sekhar, A. M. Tighezza, D. S. Saini, P. Rosaiah, and A. Ghosh*, (2024), Diffuse to Normal Ferroelectric Transition in Gd-substituted BBTO Aurivillius Ceramics, <i>Applied Physics A: Materials Science and Processing</i>, (accepted). 2. O. Ali, M. S. Alkathy, E. K. Suresh, A. Ghosh, and K. C. James Raju, (2024), Tunable Energy Bandgap of Fe-doped (Bi, Li) co-substituted Barium Titanate, <i>Physica Scripta</i>, Vol.99, No. 3, pp. 035520 (1-14). 3. S. M. Yadav, S. Kumar, M. Kumar, A. Ghosh*, D. S. Saini, (2024) High Temperature Variable Range Hopping Conduction and Dielectric Relaxation in CoFe₂O₄ Ceramic, <i>Open Ceramics</i>, Vol.17, pp. 100517 (1-11). 4. K.S.K.R. C. Sekhar, T. Patri, A. M. Tighezza, D. S. Saini, P. Rosaiah, and A. Ghosh*, (2024) Dielectric Relaxation, and Electrical Conductivity Property Correlation in Gd-doped BBTO Aurivillius Ceramics, <i>Applied Physics A: Materials Science and Processing</i>, Vol.30, pp.150 (1-14). 5. L. R. Karna, R. Upadhyay, and A. Ghosh*, (2023), All-inorganic Perovskite Photovoltaics for Power Conversion Efficiency of 31 %, <i>Scientific Reports</i>, Vol. 13, pp. 15212 (1-19). 6. D. S. Saini, S. Kumar, S. M. Yadav, M. Kumar, and A. Ghosh*, (2023), Investigation of Colossal Dielectric Behavior of Non-Ferroelectric BaZrO₃ Polycrystalline Ceramics, <i>Materials Science & Engineering B</i>, Vol. 295, pp. 116603(1-9). 7. T. Patri, A. Ghosh*, M. L. V. Mahesh, P. D. Babu, S. K. Mandal, and M N Singh, (2022), Fortified Relaxor Ferroelectricity of Rare Earth Substituted 4-layered BaBi_{3.9}RE_{0.1}Ti₄O₁₅ (RE = La, Pr, Nd, and Sm) Aurivillius Compounds, <i>Scientific Reports</i>, Vol. 12, pp. 16508 (1-19).

8. T. Patri, J. P. Kumar, **A. Ghosh***, and P. D. Babu, (2020), Tunable Polarization and Enhanced Multiferroic Response of W/Co co-doped $\text{Bi}_4\text{LaFeTi}_3\text{O}_{15}$ Aurivillius Ceramics, *Journal of Applied Physics*, Vol. 128, No.15, pp. 154102 (1-17).
9. D. S. Saini, **A. Ghosh**, S. Tripathy, A. Kumar, S. K. Sharma, N. Kumar, S. Majumdar, and D. Bhattacharya, (2020), A Promising Proton Conducting Electrolyte $\text{BaZr}_{1-x}\text{Ho}_x\text{O}_{3-\delta}$ ($0.05 \leq x \leq 0.2$) Ceramics for Intermediate Temperature Solid Oxide Fuel Cells, *Scientific Reports*, Vol.10, No.1, pp. 3461 (1-12).
10. C. Rodrigues, A. Gomes, **A. Ghosh**, A. Pereira, and J. Ventura, (2019), Power-Generating Footwear Based on a Triboelectric-Electromagnetic-Piezoelectric Hybrid Nanogenerator, *Nano Energy*, Vol. 62, pp.660-666.
11. T. Patri, P. Justin, P. D. Babu and **A. Ghosh***, (2019), Analysis of Dielectric and Magnetic Phase Transitions in $\text{Yb}(\text{Fe}_{0.5}\text{Cr}_{0.5})\text{O}_3$ Bulk Perovskite, *Applied Physics A: Materials Science and Processing*, Vol.125, pp.224 (1-12).
12. D. S. Saini, **A. Ghosh**, S. Tripathy, S. K. Sharma, A. Kumar, and D. Bhattacharya, (2018), Improved Conductivity of Spark Plasma Sintered Ho-Substituted BaZrO_3 Electrolyte Ceramics for IT-SOFCs, *ACS Applied Energy Materials*, Vol.1 No.7, pp.3469-3478.
13. D. S. Saini, S. Tripathy, A. Kumar, S. K. Sharma, **A. Ghosh** and D. Bhattacharya, (2018), Impedance and Modulus Spectroscopic Analysis of Single Phase BaZrO_3 Ceramics for SOFC Application, *Ionics*, Vol.24, No.4, pp.1161–1171.
14. T. Patri, P. Justin, K. Prabakar and **A. Ghosh***, (2016), Raman and Dielectric Spectroscopic Analysis of Magnetic Phase Transition in $\text{Y}(\text{Fe}_{0.5}\text{Cr}_{0.5})\text{O}_3$ Multiferroic Ceramics, *Ceramics International*, Vol.42, No.12, pp.13834-13840.
15. **A. Ghosh**, N. Karak and T. K. Kundu, (2013), Effect of Co Doping on Optical Behaviors in ZnO Nanorods, *AIP Conference Proceedings*, Vol.1536, pp.177-178.
16. P. Kundu, **A. Ghosh**, S. Das, and T. K. Bhattacharyya, (2012), Compatibility Study of Thin Passivation Layers with Hydrazine for Silicon-based MEMS Microthruster, *Journal of Physics D: Applied Physics*, Vol.45 No.9, pp.095302 (1-9).
17. N. Kumar, **A. Ghosh**, and R. N. P. Choudhary, (2011), Electrical Behavior of $\text{Pb}(\text{Zr}_{0.52}\text{Ti}_{0.48})_{0.5}(\text{Fe}_{0.5}\text{Nb}_{0.5})_{0.5}\text{O}_3$ Ceramics, *Materials Chemistry and Physics*, Vol.130, No.1-2, pp.381-386.
18. **A. Ghosh**, and R. N. P. Choudhary, (2010), Growth and Microstructure for Visible Emission and Surface Optical Phonon of Zn-ZnO Nanostructure, *Philosophical Magazine*, Vol.90, No.6, pp.731-751.
19. **A. Ghosh**, and R. N. P. Choudhary, (2010), Optical Emission and Absorption for Zn-ZnO Core-shell Nanostructures, *Journal of Experimental Nanoscience*, Vol.5, No.2, pp.134-142.
20. P. K. Samanta, S. K. Patra, **A. Ghosh**, and P. Roy Chaudhuri, (2009), Visible Emission from ZnO Nanorods Synthesized by a Simple Wet Chemical Method, *International Journal of Nanoscience and Nanotechnology*, Vol.1, No. 1-2, pp.81-90.
21. **A. Ghosh**, and R. N. P. Choudhary, (2009), Microstructural Aspects for Defect Emission and E_2^{high} Phonon Mode of ZnO Thin Films, *Journal of Applied Physics*, Vol.105, No.12, pp.124906 (1-6).
22. **A. Ghosh**, and R. N. P. Choudhary, (2009), Phonon Assisted Photoluminescence and Surface Optical Mode of Zn Embedded ZnO Nanostructure, *Journal of Physics D: Applied Physics*, Vol.42, No.7, pp.075416 (1-6).

	<p>23. A. Ghosh, and R. N. P. Choudhary, (2009), Structural Evolution and Visible Photoluminescence of Zn-ZnO Nanophosphor, <i>Physica Status Solidi A: Applications and Materials Science</i>, Vol.206, No.3, pp.535-539.</p> <p>24. S. Pal, A. Ghosh, T. B. Ghosh, S. De, and S. Dasgupta, (2006), Optical Quantification of Fouling During Nanofiltration of Dyes, <i>Separation and Purification Technology</i>, Vol.52, No.2, pp.372-379.</p>
Edited Books and Book Chapters:	<p>1. A. Ghosh, and B. Pradhan, Materials Today: Proceedings on Condensed Matter Days 'CMDAYS-2021', Vol. 66, Part.7, pp. 3199-3422 (2022)</p>
Seminar/ Workshop/ Conference Presentation:	<ol style="list-style-type: none"> 1. N. Kumar, A. Ghosh, and R. N. P. Choudhary, Ferroelectric and Dielectric Properties of Dy³⁺ Modified PbFe_{0.5}Nb_{0.5}O₃ Ceramics, <i>National Seminar on Ferroelectrics and Dielectrics (XXII NSFD-2022)</i>, VIT-AP University, Amaravati, Guntur 522501, Andhra Pradesh, India 17th -19th December-2022. (Invited Talk) 2. A. Ghosh, Hybrid Nanogenerator Based Self-Powered Sensors, <i>World Sensor Congress</i>, Centre for Materials Technology (C-MET), Trissur, Kerala, India 8th -10th March '22. (POSTER) 3. A. Ghosh, and J. Ventura, Strategy for Efficient Power Generating Footwear through Hybrid Nanogenerator, <i>International Conference on Functional Materials</i>, Material Science Centre, IIT Kharagpur, India, 6th -8th January '20. (ORAL) 4. A. Ghosh, N. Kumar and R.N.P Choudhary, Electrical Behaviour of Gd-substituted PbTiO₃-BiFeO₃ ceramics <i>A National Conference on Science and Technology of Functional Materials</i>, Department of Physics, <i>Institute of Technical Education and Research</i>, Shiksha 'O' Anusandhan, Bhubaneswar, India, 6th-7th December '19. (POSTER) 5. C. Rodrigues, A. Gomes, A. Ghosh, A. Pereira, and J. Ventura, Recovery of Waste Energy in Human Walking Through Hybrid Nanogenerator, <i>National Conference on Condensed Matter Physics, 'Condensed Matter Days-2019'</i> Department of Physics, Vidyasagar University, India, 29th-31st August '19. (ORAL) 6. A. Ghosh, N. Kumar and R.N.P Choudhary, the Optical and Electrical Properties of La-ion modified BiFeO₃ Nano-perovskites, <i>6th International Conference on Functional Electroceramics and Polymers</i>, Department of Physics, IIT Kharagpur, India, 20th-22nd February '17. (POSTER) 7. A. Ghosh, N. Kumar, and R.N.P Choudhary, Electrical and Optical Behaviors in La-modified BiFeO₃ Nanoceramics, <i>International Conference on Materials Science & Technology</i>, University of Delhi, India, 1st – 4th March '16. (ORAL) 8. A. Ghosh, Graphene Based Electron Field Emitter : Challenges and Prospects, <i>National Seminar on Recent Advancement in Physics</i>, Vivekananda Satavarshiki Mahavidyalaya, Manikpara, Paschim Medinipur, West Bengal, India, 20th – 21st March '15. (Invited Talk) 9. A. Ghosh, N. Kumar and R.N.P Choudhary, Modified Structural and Electrical Properties of PbTiO₃-BiFeO₃ Multiferroics, <i>National Seminar on Recent Developments in Composite & Nano Materials</i>, Hi-Tech College of Engineering,

	<p>Bhubaneswar, India, 7-8th February'15. (POSTER)</p> <p>10. A. Ghosh, N. Kumar, S. P. Singh, and P. K. Datta, Optical Non-linearity in 0.5PbTiO₃-0.5BiFeO₃ Solid Solution, <i>India-Singapur Joint Symposium</i>, Department of Physics & Meteorology, IIT Kharagpur, India, 25th-27th February'13. (POSTER)</p> <p>11. A. Ghosh, N. Karak and T. K. Kundu, Effect of Co-doping on Optical Behaviors in ZnO Nanorods, <i>International Conference on Recent Trends in Applied Physics & Material Science</i>, Government College of Engineering & Technology, Bikaner, Rajasthan, India, 1st-2nd February'13. (POSTER)</p> <p>12. A. Ghosh, N. Kumar, S. P. Singh, and P. K. Datta, Nonlinear Optical Response in La Modified BiFeO₃ Nanoceramics, <i>1st International Workshop on Nanomaterials (IWON): Engineering Photon and Phonon Transport</i>, Jadavpur University, Kolkata, India, 14th – 15th December'12. (POSTER)</p> <p>13. A. Ghosh, P. Kundu, S. Das, and T. K. Bhattacharyya, on Origin of Second Harmonic Generation in Si/SiO₂/Si₃N₄ Stack Layer, <i>National Conference on Sustainable Development through Innovative Research in Science and Technology</i>, Jadavpur University, Kolkata, India, 28th – 29th September'12. (POSTER)</p> <p>14. A. Ghosh, Nanotechnology: An Overview, <i>National Seminar on Concept of Nanotechnology and Nanobiotechnology in College Level</i>, Narajole Raj College, Paschim Medinipur, West Bengal, India, 20th January'12. (Invited Talk)</p> <p>15. A. Ghosh, Optical Characterization of Zn Embedded ZnO and Zn-ZnO Core-shell Nanostructure, <i>India-Australia International Workshop on Nanotechnology in Materials and Energy Application</i>, Jadavpur University, Kolkata, India, 29th – 31st December'11. (POSTER)</p> <p>16. A. Ghosh, Microstructure and Photo absorption of TiO₂ Nanocrystal, <i>International Conference on Nanomaterials & Nanotechnology</i>, University of Delhi, Delhi, India, 18th -21st December'11. (POSTER)</p> <p>17. A. Ghosh, Microstructure Mediated Surface Optical Phonon Mode from Zn-ZnO Nanostructure, <i>International Conference on Theoretical and Applied Physics</i>, Department of Physics & Meteorology, IIT Kharagpur, India, 1st-2nd December'11. (POSTER)</p> <p>18. A. Ghosh and R. N. P. Choudhary, Studies on the Morphology and Structure of Zn Nanoparticles by Vacuum Arc Technique, <i>National Seminar on Recent Advances in Materials' Science</i>, ISM University, Dhanbad, India, 15th -17th February'08. (ORAL)</p>
<p>Program Organized:</p>	<ol style="list-style-type: none"> 1. Convenor, <i>National Conference on Condensed Matter Physics, `Condensed Matter Days-2021`</i> Department of Physics, Central University of Jharkhand, India, 10th-12th December-2021. 2. Member of the organizing committee, <i>National Workshop on Radiation- A tool for research in Physical, Chemical and Life Sciences</i> organized at Central University of Jharkhand, Ranchi, Jharkhand, 13th -15th February'13. 3. Convenor, <i>Acquaintance Program on Inter University Accelerator Centre (IUAC)</i> organized at Central University of Jharkhand, Ranchi, Jharkhand, 23rd November'12.

Any other information:	<ul style="list-style-type: none">• Indian Association of Physics Teachers• Reviewer: 1. Nanotechnology, 2. Applied Physics A: Materials Science & Processing, 3. Applied Physics Letters, 4. Journal of Non-Crystalline Solids, 5. Journal of Applied Physics, 6. Philosophical Magazine, 7. Physica Scripta, 8. Journal of Raman Spectroscopy
Updated as on	15 th April 2024