



Anirban Roychowdhury

Assistant Professor

Head, Department of Physics,

Ex-NSS Programme Officer

Siksha Ratna Awardee-2021 (Govt. of W.B.)

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Researcher Collaboration with

Department of Physics (Material Science)

UGC-DAE Consortium for Scientific Research, Kolkata Centre

Sec-III, Plot-LB-8, Bidhannagar, Kolkata-700098, W.B., India &

Department of Physics, Jadavpur University, Kolkata-32, India

Education and Professional Career:

- Asst. Prof. in Physics (K. N. College, Berhampore, Murshidabad, W.B.)
- Ph. D. in Physics (2010-2015, Department of Physics, UGC-DAE CSR & Jadavpur University)
- M.Sc. in Physics- (2008-2010, Jadavpur University)
- B.Sc. (Hons.) in Physics - (2005-2008, Kalyani University)

Fellowships and Awards:

- Stood 1st rank in B.Sc. (Hons.) in Sripat Singh College, K.U.
- CSIR-UGC NET JRF qualified in Physical Science.
- GATE qualified in Physics.
- Best presentation award in National Conference (*DAESSPS-2013*) held at Punjab, India.
- Best presentation award in International Conference (*PPC11-2014*) held at Goa, India.

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- Awarded (2nd position) in Short Film competition as NSS Programme Officer, Krishnath College, University of Kalyani-2020.
- **Siksha Ratna Awardee-2021** (Govt. of W.B.),
- **InScA Young Researcher Award-2023** by Institute of Scholars and Academicians.

Research interest:

- Synthesis of nanostructured materials with different morphologies (nanosphere, nanorod, nanosheet, heterostructured materials) as well as core-shell nanostructures of multi-phases by chemical route.
- Possible applications of multifunctional magnetic-fluorescent nanoparticles in biomedical fields.
- Characterizations and investigations of the multifunctional properties (e.g. magnetic, optical, structural, electrical, etc) of these nanomaterials by using the sophisticated tools (XRD, SQUID, Mössbauer, Positron annihilation, Raman, UV-PL, FTIR, SEM, HRTEM, etc).

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Publications:

Publications in peer-reviewed journals:

- [1] Magnetically addressable fluorescent Fe₃O₄/ZnO nanocomposites: Structural, optical and magnetization studies, **A. Roychowdhury**, S. P. Pati, A. K. Mishra, S. Kumar and D. Das, *Journal of Physics and Chemistry of Solids* 74 (2013) 811–818.
- [2] Effects of magnetite nanoparticles on optical properties of zinc sulfide in fluorescent-magnetic Fe₃O₄/ZnS nanocomposites, **A. Roychowdhury**, S. P. Pati, S. Kumar and D. Das, *Powder Technology* 254 (2014) 583-590.
- [3] Tunable properties of magneto-optical Fe₃O₄/CdS nanocomposites on size variation of the magnetic component, **A. Roychowdhury**, S. P. Pati, S. Kumar and D. Das, *Material Chemistry and Physics*, 151 (2015) 105-111.
- [4] Signature of exchange bias and spin-glass like phenomena in Fe/CoO nanocomposite, S. P. Pati, **A. Roychowdhury**, S. Kumar and D. Das, *J. Appl. Phys.* 113, (2013) 17D708.
- [5] Structural and magnetic characterizations of undoped and K-doped NdMnO₃ single crystals synthesized by sol–gel route: A comparative study, A. Nandy, **A. Roychowdhury**, D. Das, S. K. Pradhan, *Powder Technology* 254 (2014)538-547.
- [6] Overcoming inherent magnetic instability, preventing spin canting and magnetic coding in an assembly of ferrimagnetic nanoparticles, S. Dey, S. K. Dey, K. Bagani, S. Majumder, **A. Roychowdhury**, S. Banerjee, V. R. Reddy, D. Das, S. Kumar, *Applied Physics Letters* 105 (6) (2014) 063110.

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- [7] Structural, Optical, Hyperfine and Magnetization studies of ZnO encapsulated α -Fe Nanoparticles, A. K. Rathore, S. P. Pati, **A. Roychowdhury**, M. Ghosh, D. Das, *Materials Research Bulletin*, 60 (2014) 566-571.
- [8] Positron annihilation measurements in as-grown and alpha irradiated undoped Indium Phosphide, S. Pan, A. Mandal, **A. Roychowdhury**, A. Sengupta, *Int. J. Eng. Sci. and Inn. Tech. (IJESIT)* 3(4) (2014) 774-782.
- [9] Positron annihilation measurements in high energy alpha irradiated undoped indium antimonide, S. Pan, A. Mandal, S. Mukherjee, A. K. Saha, **A. Roychowdhury**, D. Das, A. SenGupta, *International Journal of Modern Physics B* 28 (2014) 1450210.
- [10] $\{[\text{Mn}_2(\text{L-tartrate})_2(\text{H}_2\text{O})]_n \cdot 3\text{H}_2\text{O}\}_n$ –A chiral MOF : Adsorption and guest dependent magnetism, R. Saha, **A. Roychowdhury**, I. M. Steele, S. Biswasa, S. Kumar, *J. Indian Chem. Soc.*, 90 (2013) 1043-1052.
- [11] Structural, magnetic and hyperfine properties of single-phase $\text{SrFe}_{12}\text{O}_{19}$ nanoparticles prepared by a sol-gel route, A. Das, **A. Roychowdhury**, S. P. Pati, S. Bandyopadhyay, D. Das, *Physica Scripta*, 90 (2014) 025802.
- [12] The influence of cross linking and clustering upon the nanohole free volume of the SHI and γ -radiation induced polymeric material, P. Singh, R. Kumar, R. Singh, **A. Roychowdhury**, D. Das, *Applied Surface Science*, 328 (2014) 882.
- [13] Effect of Biomimetic Templates on the Magneto-Structural Properties of Fe_3O_4 Nanoparticles, S. Bhattacharya, **A. Roychowdhury**, V. Tiwari, A. I. Prasad, R. S. Ningthoujam, A. B. Patel, D. Das, S. Nayar, *RSC Advances*, 5 (2015) 13777-13785.
- [14] Facile green synthesis of iron oxide nanoparticles via solid-state thermolysis of a chiral, 3D anhydrous potassium tris(oxalato)ferrate(III) precursor, A. Saritha, B. Raju, D. Narayana Rao, **A. Roychowdhury**, D. Das, K.A. Hussain, *Advanced Powder Technology* 26 (2015) 349-354.
- [15] Magnetic Property, Mössbauer Spectroscopy and Microwave absorption of maghemite nanoparticles ($\gamma\text{-Fe}_2\text{O}_3$), encapsulated in Carbon nanotubes, S. Sutradhar, S. Das, **A. Roychowdhury**, D. Das, P. Chakrabarti, *Materials Science and Eng. B* 196 (2015) 44-52..
- [16] NiFe_2O_4 nanorod: porosity effect on spin canting, quadrupole splitting and hyperfine magnetic properties, T. Mondal, S. Bhattacharjee, **A. Roychowdhury**, S. Majumder, D. Das, M. Mitra, C. K. Ghosh, *Materials Research Express* 2 (2015) 046102.
- [17] PALS and DSC measurements in 8MeV electron irradiated natural rubber filled with different fillers, A. Mandal, S. Pan, **A. Roychowdhury**, A. Sengupta, *International Journal of Modern Physics B* 29 (2015) 1550196.

- [18] Investigation of charge transport properties in less defective nanostructured ZnO based Schottky, diode, A. Dey, A. Layek, **A. Roychowdhury**, M. Das, J. Datta, S. Middya, D. Das, P. P. Ray, *RSC Advances* 5 (2015) 36560.
- [19] Synthesis of α -Fe₂O₃- functionalised graphene oxide nano composite by a facile low temperature method and study of its hyperfine parameters, S. Nag, **A. Roychowdhury**, D. Das, S. Mukherjee, *Material Research Bulletin* 74 (2015) 109-116.
- [20] Adiabatic polaron hopping conduction and Griffiths phase in electron-doped Ca_{0.85}Dy_{0.15}MnO₃, M. H. Khan, **A. Roychowdhury**, D. Das, S. Pal, *Journal of Alloys and Compounds* 650 (2015) 328-335.
- [21] Multi-functional biomimetic graphene induced transformation of Fe₃O₄ to ϵ -Fe₂O₃ at room temperature, S. Bhattacharya, **A. Roychowdhury**, D. Das, S. Nayar, *RSC Advances* 5 (2015) 89488-89497.
- [22] Synthesis, X-ray Rietveld analysis, Mössbauer and Infrared spectroscopy of R₂FeSbO₇ (R³⁺ = Y, Dy, Gd, Bi) pyrochlore solid solution, Y. Jana, P. Halder, A. Ali Biswas, **A. Roychowdhury**, S. De, S. Kumar, D. Das, *Journal of Alloys and Compounds* 656 (2016) 226-236.
- [23] Microstructure-property correlations of multifunctional Si-Fe nanocomposite, K. Basu, S. Banerjee, **A. Roychowdhury**, D. Das, A. Basu mallick, *RSC Advance Nano Hybrids* 9 (2016) 15-23.
- [24] Effect of sodium doping on the microstructure, lattice distortion and magnetic properties of GdMnO₃ tiny single crystals, A. Nandy, **A. Roychowdhury**, T. Kar, D. Das, S. K. Pradhan, *RSC Advance* 6 (2016) 20609-20620.
- [25] Effect of doping of chromium ions on the structural and magnetic properties of nickel ferrite, Aakash, **Anirban Roychowdhury**, Dipankar Das, Samrat Mukherjee, *Ceramic International* 42 (2016) 7742-7747.
- [26] Grain size reduction effect on optical, magnetic and hyperfine properties of α -Fe₂O₃@ZnO nanocomposites prepared by the high energy ball-milling, Chandana Roy Chaudhury, **Anirban Roychowdhury**, Anusree Das, Dipankar Das, *J. Phys. Chem. Solids* 92 (2016) 38-44.
- [27] Effect of ZnO coating on two different sized α -Fe nanoparticles: Synthesis and detailed investigation of their structural, optical, hyperfine and magnetic characteristics, A. K. Rathore, S. P. Pati, M. Ghosh, **A. Roychowdhury**, D. Das, *J. Materials Science: Materials in electronics*, 28 (2017) 6950-6958.
- [28] Super hydroxyl radical-mediated biocidal effect induced antibacterial activity of tuned ZnO/chitosan type II heterostructure under dark, S. Podder, S. Halder, **A. Roychowdhury**, D. Das, C. K. Ghosh, *J. Nanoparticle Research* 18 (2016) 294.
- [29] Effect of Gd doping concentration and sintering temperature on structural, optical, dielectric and magnetic properties of hydrothermally synthesized ZnO nanostructure, S. Das, S. Das, **A. Roychowdhury**, D. Das, S. Sutradhar, *J. Alloys and Compounds*, 708 (2017) 231-246.
- [30] Cobalt doped CuO nanoparticles as a highly efficient heterogeneous catalyst for reduction of 4-nitrophenol to 4-aminophenol, A. Sharma, R.K. Dutta, **A. Roychowdhury**, D. Das, A. Goyal, A. Kapoor, *Applied Catalysis A: General*, 543 (2017) 257-265.

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- [31] Influence of magnetic ion doping on structural, optical, magnetic and hyperfine properties of nanocrystalline SnO₂ based dilute magnetic semiconductors, M.S. Inpasalini, L.K. Sharma, **A. Roychowdhury**, D. Das, S. Mukherjee, *J. Materials Science: Materials in Electronics*, 28 (2017) 3285-3292.
- [32] Radiation induced nano-scale free volume modifications in amorphous polymeric material: a study using positron annihilation lifetime spectroscopy, R. Kumar, P. Singh, S. K. Gupta, R. Gupta, M. K. Jaiswal, M. Prasad, **A. Roychowdhury**, R. P. Chauhan, D. Das, *J. Radioanalytical and Nuclear Chemistry*, 314 (2017) 1659-1666.
- [33] Structural and magnetic properties of erbium (Er³⁺) doped nickel zinc ferrite prepared by sol-gel auto-combustion method, S. Nag, **A. Roychowdhury**, S. Das, S. Mukherjee, *Journal of Magnetism and Magnetic Material* 466 (2018) 172-179.
- [34] Facile synthesis of hierarchical nickel (III) oxide nanostructure: A synergistic remediating action towards water contaminants; S. Dey, S. Podder, **A. Roychowdhury**, D. Das, C. K. Ghosh, *Journal of Environmental Management* 211 (2018) 256-266.
- [35] Non-inversion anisotropy energy in NiO coral structure: Asymmetric hysteresis loop at room temperature; S. Bhattacharjee, G. C. Das, **A. Roychowdhury**, D. Das, C. K. Ghosh, D. Bhattacharya, P. Sen, *Applied Surface Science* 449 (2018) 389-398.
- [36] Electron – Phonon interaction to tune metal – Semiconductor junction characteristics: Ultralow potential barrier and less non-thermionic emission; S. Bhattacharjee, A. Dey, S. Dey, **A. Roychowdhury**, P. P. Ray, Dipankar Das, G. C. Das, C. K. Ghosh, *Physica B: Condensed Matter* 547 (2018) 101-110.

Publications in Conference Proceedings:

- [1] Structural, hyperfine, magnetic and optical studies on sonochemically prepared Fe₃O₄-ZnO nanocomposites, **A. Roychowdhury**, S. P. Pati, A. K. Mishra and D. Das, *International Conference on Laser, Material Science and Communication* (ICLMSC-2011).
- [2] Synthesis and characterization of multifunctional Fe₃O₄-ZnO nanocomposite, **A. Roychowdhury**, A. K. Mishra, S. P. Pati and D. Das, *AIP Conf. Proc.* 1447, (2012) 283-284.
- [3] Magnetic-fluorescent nanocomposite: A case study on Fe₃O₄/ZnS, **A. Roychowdhury**, S. P. Pati, S. Kumar and D. Das, *AIP Conf. Proc.* 1512, (2013) 246-247.
- [4] Modified properties of Fe₃O₄ nanoparticles on incorporation of optically active ZnSe, **A. Roychowdhury**, A. Das, S.P. Pati, S. Kumar, D. Das, *AIP Conf. Proc.* 1591 (2014) 396-398.
- [5] Structural, magnetic and Mössbauer studies of (BiFeO₃)_{0.7}-(SrFe₁₂O₁₉)_{0.3} nanocomposite prepared by a sol-gel route, A. Das, **A. Roychowdhury**, S.P. Pati, S. Bandyopadhyay, D. Das, *AIP Conf. Proc.* 1591 (2014) 399-401.

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- [6] Defect study of Alpha irradiated undoped InSb using Positron Annihilation Spectroscopy, S. Pan, A. Mandal, S. Mukherjee, A. K. Saha, **A. Roychowdhury**, D. Das, A. SenGupta, *Inter. J. Inn. Res. Sci., Eng. Tech. (IJIRSET)*, 3 (2014) 135-139.
- [7] Milling duration induced structural and magnetic properties of Fe/MnO nanocomposites, S. P. Pati, **A. Roychowdhury**, S. Kumar, D. Das, *AIP Conference Proc.* 107 (2013) 1536-1537.
- [8] Evidence of exchange bias in Fe/Co₃O₄ nanocomposites, S. P. Pati, **A. Roychowdhury**, S. Kumar, D. Das, *AIP Conference Proc.*, 1447 (1) (2012) 1135-1136.
- [9] Use of Iron Oxide Nanoparticles as a Biomedical Remediation” presented on the seminar “Role of IQAC in Fostering Environmental Consciousness.” Organised by IQAC, Krishnath College, Berhampore, Murshidabad. On 9th September’ 2015

Conferences Attended:

- (i) Magnetic Materials and Applications (**MagMA 2011**) at S. N. Bose, on 24th -25th January, 2011.
- (ii) Magnetic Phase Transitions and Transformations (**MPTT**) at JU, Kolkata, on 3rd-9th August, 2011.
- (iii) International Conference on Laser, Material Science and Communications (**ICLMSC-2011**) at Burdwan University, India on 7th-9th December, 2011.
- (iv) 56th DAE Solid State Physics Symposium at SRM University, Chennai on 19th -23rd Dec’2011.
- (v) 57th DAE Solid State Physics Symposium held at IIT Bombay, Mumbai during 3rd-7th Dec’2012.
- (vi) International Conference on Magnetic Materials and Applications (**MagMA-2013**) held at Indian Institute of Technology Guwahati (IITG), Guwahati, India during 5th-7th December, 2013.
- (vii) 58th DAE Solid State Physics Symposium (**DAESSPS-2013**) held at Thapar University, Patiala, Punjab, India during 17th -21th December, 2013.
- (viii) 11th International conference on Positron and Positronium Chemistry (**PPC11-2014**) held at Goa, India, during 9th -14th November, 2014.
- (ix) International Conference on Advances Materials and Energy Technology (**ICAMET-2014**) held at IEST, Shibpur, WB, India 17th-19th December, 2014.
- (x) One day seminar on “Acharya Brajendranath Seal: The Great Humanist and Scientific Philosopher”, on 23rd September, 2015, organised by Department of Philosophy, Krishnath College, Berhampore, Murshidabad.
- (xi) One day seminar on “Parliamentary Democracy in India: Theory and Practice”. On 5th October, 2015 organised by Department of Political Science, Krishnath College, Berhampore, Murshidabad.

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- (xii) One day seminar on “Career Advancement of College Staff and Office Management” On 3rd September, 2016 organised by IQAC, Krishnath College, Berhampore, Murshidabad.
- (xiii) Departmental Seminar on “Administrative Corruption in India: Reflections on the Problem and Potential Solutions”. On 26th April’2017 organised by Department of Political Science, Krishnath College, Murshidabad.
- (xiv) One day seminar on “Role of Sister Nivedita in Women’s Empowerment and Social Reforms”.on 28th October’2017 organised by Chitragada, Women’s Cell, Krishnath College, Berhampore, Murshidabad.
- (xv) Orientation Programme on “Recent developments on CAS and teacher’s centric approach”. On 10th February’ 2018 organised by IQAC, Krishnath College, Berhampore, Murshidabad.
- (xvi) Two-day district level Seminar on “Sampriti Saptaha” commemorating the 125th anniversary of Swami Vivekanada’s Chicago lecture. On 11 &12th September’2018 organised by DPI, Govt. of West Bengal.
- (xvii) One Week Faculty Development Programme on “Statistical Modelling & Data Analysis: Its Engineering Application”. During **11.01.2016 to 15.01.2016 organised by** Govt. College of Engineering & Textile Technology, Berhampore, Murshidabad

Seminar organised and conducted

- (i) “Innovation Has No Limit”, One Day Seminar organised by Department of Physics, Krishnath College, Berhampore, Murshidabad. On **19.11.2017**.
- (ii) “Recent Trends in General Science”. One Day Science Awareness workshop organised by Department of Physics, Krishnath College, Berhampore, Murshidabad on **16.02.2019**.

Thank you

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