



Dr. Apurba Kanti Deb

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EDUCATIONAL QUALIFICATION:

- Received **B.Sc** (Bachelor of Science) Degree in Physics (Honours) from University of North Bengal, Raja Rammohunpur, West Bengal, India in 1997.
- Received **M.Sc** (Master of Science) in Physics from Jadavpur University, Jadavpur, Kolkata, INDIA in 2000; Specialization Computational Application in Physics.
- Ph.D thesis** (Title: *Structural and Microstructural Studies of Chemically Synthesized Materials and Its Composites by X-ray Powder Diffraction and Other Methods*) awarded on January, 2007 by Jadavpur University, Kolkata under the supervision of Prof. S P Sengupta, Department of Materials Science, Indian Association for the Cultivation of Science, Kolkata-32, INDIA

PERMANENT POSITIONS HELD:

- Assistant Professor,** Department of Physics, Raiganj College (University College), Raiganj – 733 134, Uttar Dinajpur, West Bengal, INDIA
Responsibilities: To teach Under Graduate students & carry out Research activity in X-ray Powder Diffraction.
Period of work: 22nd February, 2007 to 2nd February, 2015
- Assistant Professor,** Department of Physics, Raiganj University, Raiganj – 733 134, Uttar Dinajpur, West Bengal, INDIA
Responsibilities: Under Graduate & Post Graduate teaching and research in Materials Science especially in X-ray Powder Diffraction
Period of work: 3rd February, 2015 to till date

PROFESSIONAL EXPERIENCES:

- Research Fellow:** Indian Association for the Cultivation of Science; Kolkata-32, INDIA 2nd July, 2001 to 21st February, 2007.

FIELD OF SPECIALIZATION:

Experimental Materials Science especially X-ray Powder Diffraction Line Profile analysis

EXPERTISE AND CURRENT RESEARCH INTERESTS:

- ❑ Synthesizing/ preparing metal oxides, doped oxides, metal-ceramic oxide composites etc. in nanometric scale by chemical routes like solution combustion technique, sol-gel method.
- ❑ X-ray Line Profile Analysis
- ❑ Rietveld analysis of X-ray diffraction and Synchrotron data
- ❑ Structural and microstructural studies of various metal oxides, doped oxides, metal-ceramic oxide composites alloys and rare earth manganites.
- ❑ Experience in handling X-ray Powder Diffractometers of various make and also in operating Planetary Ball Miller
- ❑ Have experience on SEM, EDX, HRTEM, FTIR, Raman Spectroscopy measurements and recently have experience in Antimicrobial study.

PUBLICATIONS IN PEER REVIEWED JOURNALS:

41. "Microstrain and lattice disorder in nanocrystalline titanium dioxide prepared by chemical route and its relation with phase transformation"
Apurba Kanti Deb and Partha Chatterjee.
J. Theo. Appl. Phys. (2020) **14**, 285-293.
(DOI: 10.1007/s40094-020-00382-5)
40. "Bio-molecule functionalized rapid one-pot green synthesis of silver nanoparticles and their efficacy toward the multidrug resistant (MDR) gut bacteria of silkworms (*Bombyx mori*)"
Sudip Some, Biraj Sarkar, Kinkar Biswas, Tushar K. Jana, Debjoy Bhattacharjya, Paulami Dam, Rittick Mondal, Anoop Kumar, **Apurba K. Deb**, Abdul Sadat, Soumen Saha, Ahmet Kati, Ismail Ocsoy, Octavio L. Franco, Amitava Mandal, Sukhendu Mandal, Amit Kumar Mandal and 'Ikbal Agah 'Ince.
RSC Advances (2020) **10**, 22742-22757.
(DOI: 10.1039/d0ra03451g)
39. "Introduction of Room Temperature Ferromagnetism in Nanocrystalline Samarium Oxide by Doping of Co-ion"
J. Mandal, K. Yoshimura, B.J. Sarkar, **A. K. Deb**, and P.K. Chakrabarti.
J. Electronic Materials (2019) **48**(12), 8047-8053. (<https://doi.org/10.1007/s11664-019-07614-8>)
38. "Thermoelectrical properties of Bi₂Te₃ nanocomposites"
V. A. Kulbachinskii, V. G. Kytin, N. V. Maslov, P. Singha, Subarna Das, **A. K. Deb**, and A. Banerjee.
Materials Today: Proc. (2019) **8**, 573-581.
37. "Estimation of Lattice Strain in Alumina-Zirconia Nanocomposites by X-ray Diffraction Peak Profile Analysis"
Apurba Kanti Deb and P. Chatterjee.
J. Theo. Appl. Phys. (2019) **13**, 221-229.
36. "The Rietveld Method: Theory and Applications"
Partha Chatterjee and **Apurba Kanti Deb**
Int. J. Sci. Res. Rev. (2019) **8** (2), 2206-2229.
35. "Role of graphite on the thermoelectric performance of Sb₂Te₃/graphite nanocomposite"
Subarna Das, P. Singha, **A. K. Deb**, S.C. Das, S. Chatterjee, V. A. Kulbachinskii, V. G. Kytin, D. A. Zinoviev, N. V. Maslov, Sandip Dhara, S. Bandyopadhyay and Aritra Banerjee.
J. Appl. Phys. (2019) **125**, 195105-1 - 195105-8.
34. "Study of deformation microstructure of nickel samples at very short milling times: effects of addition of α -Al₂O₃ particles"
Apurba Kanti Deb and P. Chatterjee.
J. Theo. Appl. Phys. (2019) **13**, 63-73.

33. "Modulation of thermal conductivity and thermoelectric figure of merit by anharmonic lattice vibration in Sb₂Te₃ thermoelectrics"
Diptasikha Das, K. Malik, Subarna Das, P. Singha, **A. K. Deb**, V. A. Kulbachinskii, Raktim Basu, Sandip Dhara, Arup Dasgupta, S. Bandyopadhyay and Aritra Banerjee.
AIP Advances (2018) **8**, 125119-1 - 125119-12.
32. "Evolution of phonon anharmonicity in Se-doped Sb₂Te₃ thermoelectrics"
Diptasikha Das, Subarna Das, P. Singha, K. Malik, **A. K. Deb**, A. Bhattacharyya, V.A. Kulbachinskii, Raktim Basu, Sandip Dhara, S. Bandyopadhyay and Aritra Banerjee.
Physical Review B (2017) **96**, 064116-1 - 064116-10.
31. "Microstructure investigation, optical properties and magnetic phase transition of Tm³⁺ substituted nanorods of ZnO (Zn_{0.95}Tm_{0.05}O)"
A. Bandyopadhyay, S. Sutradhar, B.J. Sarkar, **A. K. Deb**, S. Kobayashi, K. Yoshimura and P.K. Chakrabarti.
RSC Advances (2016) **6**, 101818-101826.
30. "Evidence of iso-structural phase transition in rhombohedral Bi-Sb alloy"
K. Malik, D. Das, **A. K. Deb**, V.A. Kulbachinskii, V. Srihari, S. Bandyopadhyay and A. Banerjee.
EPL (2016) **115**, 58001-p1 - 58001-p6.
29. "Tuning of thermoelectric properties with changing Se content in Sb₂Te₃"
D. Das, K. Malik, **A. K. Deb**, V. A. Kulbachinskii, V.G. Kytin, S. Chatterjee, D. Das, S. Dhara, S. Bandyopadhyay and A. Banerjee.
EPL (2016) **113**, 47004-p1 - 47004-p6.
28. "XRD, HRTEM, Raman and magnetic studies on chemically prepared nanocrystalline Fe-doped gadolinium oxide (Gd_{1.90}Fe_{0.10}O_{3-δ}) annealed in vacuum"
B.J. Sarkar, **A. K. Deb**, and P.K. Chakrabarti.
RSC Advances (2016) **6**, 6395-6404.
27. "Paramagnetic to ferromagnetic phase transition of Co doped Gd₂O₃ prepared by chemical route"
B.J. Sarkar, A. Bandyopadhyay, J. Mandal, **A. K. Deb**, and P.K. Chakrabarti.
J. Alloys Comp. (2016) **656**, 339-346.
26. "The effect of quenching from different temperatures on Bi_{0.88}Sb_{0.12} alloy"
Kartik Malik, Diptasika Das, S.K. Nogi, **A. K. Deb**, Arup Dasgupta, S. Bandyopadhyay and Aritra Banerjee.
J Phys Chem Solids (2016) **91**, 7-12.
25. "Defect induced structural and thermoelectric properties of Sb₂Te₃ alloy"
Diptasika Das, K. Malik, **A. K. Deb**, Sandip Dhara, S. Bandyopadhyay and Aritra Banerjee.
J. Appl. Phys. (2015) **118**, 045102 – 045102-7.
24. "Magnetic phase transition of nanocrystalline Fe-doped samarium oxide (Sm_{1.90}Fe_{0.10}O₃)"
J. Mandal, B.J. Sarkar, **A. K. Deb**, and P.K. Chakrabarti.
J. Mag. Mag. Mat. (2014) **371**, 35-42.
23. "Room temperature ferromagnetism in Fe-doped europium oxide (Eu_{1.90}Fe_{0.10}O_{3-δ})"
A. Bandyopadhyay, **A. K. Deb**, S. Kobayashi, K. Yoshimura and P.K. Chakrabarti.
J. Alloys Comp. (2014) **611**, 324-328.
22. "Temperature dependent structural property and power factor of n type thermoelectric Bi_{0.90}Sb_{0.10} and Bi_{0.86}Sb_{0.14} alloy"
K. Malik, Diptasika Das, S. Bandyopadhyay, P. Mandal, **A. K. Deb**, Velaga Srihari and Aritra Banerjee.
Appl. Phys. Lett. (2013) **103**, 242108-1 – 242108-5.
21. "Magnetic and Mössbauer Studies of Bare and Encapsulated Nanoparticles of [(Co_{0.2}Mn_{0.3}Zn_{0.5}Fe₂O₄)(1-x)(ZnO/PVA)_x (x = 0 and 0.30)]"
S. Mukherjee, K. Mukhopadhyay, S. Sutradhar, S. Pati, **A. K. Deb**, D. Das, and P.K. Chakrabarti.
J. Phys. Chem. C (2013) **117**, 12787-12799.

20. "Sb concentration dependent structural and resistive properties of polycrystalline Bi-Sb alloys"
K. Malik, Diptasika Das, D. Mondal, D. Chattopadhyay, **A. K. Deb**, S. Bandyopadhyay and Aritra Banerjee.
J. Appl. Phys. (2012) 112, 083706 – 083706-6.
19. "Sol-gel derived nanocrystalline multiferroic BiFeO₃ and R³⁺ (R= Er and Tm) doped therein: Magnetic phase transitions and enhancement of magnetic properties"
S. Acharya, S. Sutradhar, J. Mandal, K. Mukhopadhyay, **A. K. Deb** and P.K. Chakrabarti.
J. Mag. Mag. Mat. (2012) 324, 4209-4218.
18. "Vacancy mediated room temperature ferromagnetism in Co-doped Dy₂O₃"
A. Bandyopadhyay, S. Sutradhar, B. J. Sarkar, **A. K. Deb**, and P.K. Chakrabarti.
Appl. Phys. Lett. (2012) 100, 252411-1 – 252411-5.
17. "Microstructural analysis and paramagnetic to ferromagnetic phase transition of chemically synthesized nanoparticles of Tb-doped ZnO"
A. Bandyopadhyay, **A. K. Deb**, K. Mukhopadhyay, S. K. Roy and P.K. Chakrabarti.
J. Mater. Sci. (2012) 47, 2284-2293.
16. "Preparation and microstructural characterization of nanocrystalline Mn-doped ZnO"
B. Roy, O. Mondal, **A. Deb**, S. P. SenGupta, P. Chatterjee and M. Pal.
Nano (2011) 6(4), 379-385. (DOI: 10.1142/S179329201100272X)
15. "Enhanced magnetic behavior of Al substituted LaFeO₃ (La_(1-x)Al_xFeO₃, x=0.10 and 0.30)"
S. Acharya, **A. K. Deb**, D. Das and P.K. Chakrabarti.
Materials Letters (2011) 65, 1280-1282.
14. "Structural stability and optical properties of nanocrystalline zirconia"
S. Manna, T. Ghoshal, **A. K. Deb** and S. K. De.
J. Appl. Cryst. (2010) 43, 780-789.
13. "Microstructural, magnetic and crystal field investigations of nanocrystalline Dy³⁺ doped zinc oxide"
A. Bandyopadhyay, S. Modak, S. Acharya, **A. K. Deb** and P.K. Chakrabarti.
Solid State Sciences (2010) 12, 448-454.
12. "Magnetic properties of Ni_{2+x}Mn_{1-x}In Heusler alloys: Theory and experiment"
S. Chatterjee, V. R. Singh, **A. K. Deb**, S. Giri, S. K. De, I. Dasgupta and S. Majumdar
J. Mag. Mag. Mat. (2010) 322, 102-107.
11. "Global and Local Properties of Zinc Containing Peptide Deformylase through Molecular Dynamics Simulation in Vacuum and Aqueous Environment"
Shyamal Sharma, **Apurba Kanti Deb** and Asim Kumar Bothra
The Icfai University Journal of Biotechnology (2009) III (2), 41-49.
10. "Synthesis and room temperature ferromagnetism in Fe doped NiO nanorods"
S. Manna, **A. K. Deb**, J. Jagannath and S. K. De
J. Phys. Chem. C (2008) 112 (29), 10659-10662.
9. "Transport, magnetic and structural investigations of Co-Ni-Al shape memory alloy"
S. Chatterjee, M. Thakur, S. Giri, S. Majumdar, **A. K. Deb** and S. K. De
J. Alloys Comp. (2008) 456, 96-100.
8. "Magneto-structural instability in Ni₂Mn_{1.4}Sb_{0.6} alloy"
S. Chatterjee, S. Giri, S. Majumdar, **A. K. Deb**, S. K. De and V. Hardy
J. Phys.: Condensed Matter (2007) 19, 346213-346222.
7. "Microstructural characterization of ball-milled α-Al₂O₃: bimodal size distribution and shape anisotropy"
A. K. Deb, P. Chatterjee and S. P. Sen Gupta

J. Appl. Cryst. (2007) 40, 33-39.

6. "Synthesis and microstructural characterization of α -Al₂O₃ - t-ZrO₂ composite powders prepared by combustion technique"
A. K. Deb, P. Chatterjee and S. P. Sen Gupta

Mater. Sc. Eng. A (2007) 459, 124-131.

5. "Structural investigation of tetragonally stabilized ZrO₂ in α -Al₂O₃ – t-ZrO₂ composites"
A. K. Deb, P. Chatterjee and S. P. Sen Gupta

J. Appl. Cryst. (2006) 39, 601-603.

4. "Bimodal size distribution and shape anisotropy in ball-milled nano-sized α -Al₂O₃"
A. K. Deb, P. Chatterjee and S. P. Sen Gupta

Mater. Manu. Proc. (2006) 21, 641-643.

3. "An X-ray diffraction study on dislocation microstructure of as-prepared Al-Al₂O₃ composites"
A. K. Deb, P. Chatterjee and S. P. Sen Gupta

Acta Mater. (2004) 52, 2755-2764.

2. "A novel method for the determination of grain-size distribution and microstrain in nanocrystalline materials from single X-ray diffraction peak"
P. Chatterjee, **A. K. Deb** and S. P. Sen Gupta

Ind. J. Phys. (2004) 78A (2), 205-209.

1. "Dependence of U, V, W and other profile shape related parameters on standard Si sample microstructure"
A. K. Deb, P. Chatterjee and S. P. Sen Gupta

Ind. J. Phys. (2004) 78 (7), 539-545.