

Dr. Mahuya Chakrabarti



Personal data

Born *March 13, 1976*

Nationality *Indian*

Gender *Female*

Marital status *Married*

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Academic Profile

B. Sc. Physics (Honours) *(1997) Bethune College, University of Calcutta, India*

M. Sc. Physics *(1999) University of Calcutta, India*

Ph. D. (Science) *(1998) University of Calcutta, India*

Thesis title : *"Positron annihilation studies on high temperature superconductors"*

Teaching Experience:

Employer's Name & Address	Designation	Date of joining	Date of leaving	Nature of experience
Department of Physics, Basirhat College, Basirhat	Assistant Professor	April, 2017	Till date	Teaching
Department of Physics, APC College, New Barackpore	Guest Lecturer (Post Graduate)	Nov, 2009	March, 2017	Teaching
Department of Physics, Dum Dum Motijheel College	Guest Lecturer (Under Graduate)	Nov, 2009	March, 2015	Teaching

Research Experience:

Total Number of Research Years: **23 years**

University / Organisation	Designation	From	To	Total Period	Nature of Experience
Department of Physics, University of Calcutta	Dr. D. S. Kothari Post Doctoral Fellow	16th June 2010	15th June, 2013	3 years	Research
Variable Energy Cyclotron Centre	Research Associate (CSIR)	2nd April, 2007	30th April 2010	3 years	Research

Variable Energy Cyclotron Centre	Senior Research Fellow (CSIR)	1st April, 2005	31st March 2007	2 years	Research
Department of Physics, University of Trento, Italy	Visiting Fellow	2nd Feb., 2005	31st March, 2005	2 months	Research
Variable Energy Cyclotron Centre	Research Fellow	1st April, 2003	31st Jan., 2005	1 year 10 months	Research
Department of Physics, University of Calcutta	Research Fellow	10th Jan 2000	31st March, 2003	3 years	Research

Research Guidance

- (i) Post -graduate level : Awarded ...12.....
(ii) Ph. D. Supervisor : Pursuing

Topic of research:

Research Experience

Instrumental experience

- a) Positron Annihilation Spectroscopy
- b) Mossbauer Spectroscopy
- c) UV-VIS spectroscopy
- d) Photoluminescence (PL) Spectroscopy
- e) X-ray diffraction Technique

- f) Transmission Electron Microscopy (TEM)
- g) Superconducting Quantum Interference Devices (SQUID)
- h) Four probe resistivity measurement

Sample preparation technique

- Synthesis of non magnetic semiconductors, dilute magnetic semiconductors, ferrites, high temperature superconductors, nanocrystalline oxides.
- Synthesis techniques like sol-gel process, wet chemical route, mechanical milling and solid state reaction method.

Research publications

Number of International Journal Publications	:	41
Number of Invited Review / Chapter in book	:	4
h-index	:	19

Professional Awards and Honors

- Qualified **CSIR-UGC NET (LS)**, CSIR, New Delhi in Physical Sciences, 2009.
- Selected as a **Dr. D. S. Kothari Postdoctoral Research Fellow**, UGC, New Delhi, 2010.
- Selected as a **Research Associate (RA)**, CSIR, New Delhi in Physics, 2007
- Selected as a **Senior Research Fellow (SRF)**, CSIR, New Delhi in Physics, 2005.
- Qualified in **Graduate Aptitude Test in Engineering (GATE)**, 2000
- Qualified in **Joint Entrance Screening Test (JEST)**, 2000.

List of Publications

Chapter in Book

1. Probing defects by positron annihilation spectroscopy
M. Chakrabarti and D. Sanyal
“*Nano-materials in bio-medical applications :A Novel approach*”
Materials Research Forum (2018), <http://dx.doi.org/10.21741/9781945291739-6>
2. Studies of Cu-based high temperature superconductors by using coincidence Doppler broadening of the electron positron annihilation radiation measurement technique
M. Chakrabarti, A. Sarkar, S. Chattopadhyay and D. Sanyal
“*New Topics in Superconductivity Research*” edited by Barry P. Martins (*Nova Science, New York*)(2006).
3. Probing Materials by Positron Annihilation Technique and Mossbauer Spectroscopy – Review
M. Chakrabarti, S. Chattopadhyay, D. Sanyal, A. Sarkar and D. Jana
Materials Science Forum, **699** (2012) 1-38.
<https://doi.org/10.4028/www.scientific.net/MSF.699.1>

Invited Review

4. Role of defects in tailoring structural, electrical and optical properties of ZnO
S. Dutta, S. Chattopadhyay, A. Sarkar, M. Chakrabarti, D. Sanyal and D. Jana
Prog.in Mat. Science **54** (2009) **89-136.**
<https://doi.org/10.1016/j.pmatsci.2008.07.002>

Published in peer reviewed journals

5. Magnetic Properties of Defect Induced β -Ga₂O₃: A First Principles Study
A. K. Nayek, S. Moshat, D. Sanyal and M. Chakrabarti
Comp. Cond. Matt **35** (2023) e00810.
<https://doi.org/10.1016/j.cocom.2023.e00810>
6. NMR study of defect induced magnetism in methylammonium lead iodide perovskite
B. Bandyopadhyay, H. Luitel, S. Sil, J. Dhar, M. Chakrabarti, P.Nath, P. P. Ray and D. Sanyal
Phys. Rev. B **101** (2020) **094417.**
<https://doi.org/10.1103/PhysRevB.101.094417>

7. Room-temperature ferromagnetism in boron-doped oxides: a combined first-principle and experimental study
H. Luitel, S. Roy, M. Chakrabarti, P. Chettri, A. Tiwari, V. Naik and D. Sanyal
Phil. Mag. Lett. **100** (2020) 141.
<https://doi.org/10.1080/09500839.2020.1733122>
8. Defect induced room temperature ferromagnetism in methylammonium lead iodide perovskite,
S. Sil, H. Luitel, J. Dhar, M. Chakrabarti, P. P. Ray, B. Bandyopadhyay and D. Sanyal
Phys. Lett. A **384** (2020) 126278.
<https://doi.org/10.1016/j.physleta.2020.126278>
9. Ferromagnetic property of copper doped ZnO: a first-principles study
A. K. Nayek, H. Luitel, B. Haldar, D. Sanyal, M. Chakrabarti
Comp. Cond. Matt. **23** (2020) e00455.
<https://doi.org/10.1016/j.cocom.2020.e00455>
10. Depth resolved defect characterization of energetic ion irradiated ZnO by positron annihilation techniques and photoluminescence
A. Sarkar, M. Chakrabarti, D Sanyal, N. Gogurla, P. Kumar, R. S. Brusa and C. Hugenschmidt
J of Phys. Cond. Matt. **32** (2019) 085703
<https://doi.org/10.1088/1361-648X/ab3f74>
11. Ab-initio calculation and experimental observation of room temperature ferromagnetism in 50 keV nitrogen implanted rutile TiO₂
H. Luitel, M. Chakrabarti, A. Sarkar, S. Dechoudhury, D. Bhowmick, V. Naik and D. Sanyal
Mat. Res. Exp. **5** (2017) 026105.
<https://doi.org/10.1088/2053-1591/aaab8c>
12. Positron annihilation lifetime characterisation of oxygen ion irradiated rutile TiO₂
H. Luitel, A. Sarkar, M. Chakrabarti, S. Chattopadhyay, K. Asokan and D. Sanyal
Nuclear Instru. & Methods B **379** (2016) 215.
<https://doi.org/10.1016/j.nimb.2016.04.014>
13. Defects induced ferromagnetism in SnO₂: A combined study using Density functional theory and Positron annihilation spectroscopy
A. Sarkar, D. Sanyal, P. Nath, M. Chakrabarti, S. Pal, S. Chattopadhyay, D. Jana and K. Asokan
RSC Advances **5** (2015) 1148.
<https://doi.org/10.1039/C4RA11658E>

14. Positron probing of electron momentum re-distribution at the superconducting transition in Ba(Fe_{1-x}Co_x)₂As₂ single crystals
D. Sanyal, Th. Wolf, M. Chakrabarti and U De
*Solid.State Commun.***180** (2014) 35.
<https://doi.org/10.1016/j.ssc.2013.11.021>
15. Room temperature ferromagnetic ordering in 4 MeV Ar⁵⁺ irradiated TiO₂
D. Sanyal, M. Chakrabarti, P. Nath, A. Sarkar, D. Bhowmick and A. Chakrabarti
*J of Phys. D***47** (2014) 025001.
<https://doi.org/10.1088/0022-3727/47/2/025001>
16. Defects in 6 MeV H⁺ irradiated hydrothermal ZnO single crystal
A. Sarkar, M. Chakrabarti, D. Bhowmick, , A. Chakrabarti, S. K. Ray, D. Rafaja and D. Sanyal
J. Phys.: Condens. Matter **25** (2013) 385501.
<https://doi.org/10.1088/0953-8984/25/38/385501>
17. Surface defects induced ferromagnetism in mechanically milled nanocrystalline ZnO
Srabantika Ghose, A. Sarkar, S. Chattopadhyay, M. Chakrabarti, D. Das, T. Rakshit, S. K. Ray and D. Jana
Journal of Applied Physics **114**, 073516 (2013).
<https://doi.org/10.1063/1.4818802>
18. Defects in 700 keV oxygen ion irradiated ZnO
S. Pal, A. Sarkar, S. Chattopadhyay, M. Chakrabarti, D. Sanyal, P. Kumar, D. Kanjilal, T. Rakshit, S. K. Ray and D. Jana,
*Nucl. Inst. & Method B***311** (2013) 20.
<https://doi.org/10.1016/j.nimb.2013.06.009>
19. Interplay of 4f–3d Magnetism and Ferroelectricity in DyFeO₃
B. Rajeswaran, D. Sanyal, M. Chakrabarti, Y. Sundarayya, A. Sundaresan and C. N. R. Rao
Euro Phys. Lett **101** (2013) 17001.
<https://doi.org/10.1209/0295-5075/101/17001>
20. Positron annihilation characterization of nanocrystalline ZnO
M. Chakrabarti, D. Jana and D. Sanyal
Vacuum **87** (2013) 16.
<https://doi.org/10.1016/j.vacuum.2012.06.013>
21. Photoluminescence and positron annihilation spectroscopic investigation on a H⁺ irradiated ZnO single crystal
A. Sarkar, M. Chakrabarti, D. Sanyal, D. Bhowmick, S. Dechoudhury, A. Chakrabarti, T. Rakshit and S. K. Ray
J. Phys.: Condens. Matter **24** (2012) 325503.
<https://doi.org/10.1088/0953-8984/24/32/325503>

22. Improved and delayed radiative emission response of Eu-doped BaTiO₃ nanoscale system
M. Borah, D. Mohanta, D. Sanyal, M. Chakrabarti, and D. Jana
Eur. Phys. J. Appl. Phys. **59** (2012) 10402.
<https://doi.org/10.1051/epjap/2012120110>
23. Microstructure, Mossbauer and optical characterizations of nanocrystalline α -Fe₂O₃
synthesized by chemical route
A. Banerjee, S. Patra, M. Chakrabarti, D. Sanyal, M. Pal, and S. K. Pradhan
Ceramics (2011).
<https://doi.org/10.5402/2011/406094>
24. Positron annihilation lifetime and photoluminescence studies on single crystalline ZnO
A. Sarkar, M. Chakrabarti, S. K. Roy, D. Bhowmick and D. Sanyal
J of Phys. Cond. Matt. **23** (2011) 155801.
<https://doi.org/10.1088/0953-8984/23/15/155801>
25. Synthesis and positron characterizations of ferromagnetic Zn_{0.98}Mn_{0.02}O and paramagnetic
Zn_{0.98}Mn_{0.02}O samples
D. Sanyal, M. Chakrabarti and A. Chakrabarti
Solid State Commun. **150** (2010) 2266.
<https://doi.org/10.1016/j.ssc.2010.09.028>
26. Room temperature optical and magnetic properties of Polyvinylpyrrolidone capped ZnO
nanoparticles
M. Chakrabarti, S. Das, K. R. Chakrabarti, D. Sanyal, and A. Chakrabarti
Mat. Characterization **60** (2009) 1014.
<https://doi.org/10.1016/j.matchar.2009.04.006>
27. Observation of high ferromagnetic ordering in Fe implanted ZnO at room temperature
D. Sanyal, M. Chakrabarti, V. Naik, T. Kundu Roy, D. Bhowmick, S. Dechoudhury, A.
Bandyopadhyay, and A. Chakrabarti
Nucl. Instrum.& Method B **267** (2009) 1783.
<https://doi.org/10.1016/j.nimb.2009.02.062>
28. Identifying defects in multiferroicnanocrystalline BaTiO₃ by positron annihilation
techniques
R.V.K. Mangalam, M. Chakrabarti, D. Sanyal, A. Chakrabarti, and A. Sundaresan
J of Phys. Cond. Matt. **21** (2009) 445902.
<https://doi.org/10.1088/0953-8984/21/44/445902>
29. Low energy positron scattering from Dihydropyran
A. Zecca, L. Chiari, K. L. Nixon, M. J. Brunger, S. Chattopadhyay, D. Sanyal, M.
Chakrabarti
J of Phys. Chem. A **113** (2009) 14251.
<https://doi.org/10.1021/jp9024602>

30. Defect dynamics in annealed Si₃N₄ by positron annihilation spectroscopy
 S. Chattopadhyay, S. Dutta, D. Jana, S. Chattopadhyay, D. Das, , M. Chakrabarti, D. Sanyal, and A. Sarkar
Phys. Stat. Solidi (2009) 6 2533.
<https://doi.org/10.1002/pssc.200982077>
31. Observation of room temperature ferromagnetism in Mn-Fe doped ZnO,
 M. Chakrabarti, S. Dechoudhury, D. Sanyal, T. K. Roy, D. Bhowmick and A. Chakrabarti
J. of Phys. D 41 (2008) 135006.
<https://doi.org/10.1088/0022-3727/41/13/13500>
32. Defect studies in annealed ZnO by positron annihilation spectroscopy,
 D. Sanyal, T. K. Roy, M. Chakrabarti, S. Dechoudhury, D. Bhowmick and A. Chakrabarti
J. of Phys. Cond. Matt. 20 (2008) 045217.
<https://doi.org/10.1088/0953-8984/20/04/045217>
33. Particle size dependence of magnetic, optical and defect parameters in mechanically milled Fe₂O₃,
 M. Chakrabarti, A. Banerjee, D. Sanyal, M. Sutradhar and A. Chakrabarti
J of Mat.Sciences 43 (2008) 4175.
<https://doi.org/10.1007/s10853-008-2573-6>
34. The origin of ferromagnetism and defect-magnetization correlation in nanocrystallineZnO,
 D. Sanyal, M. Chakrabarti, T. K. Roy and A. Chakrabarti
Phys. Letts. A371 (2007) 482.
<http://dx.doi.org/10.1016/j.physleta.2007.06.050>
35. Preparation of Zn_{1-x}Cd_xFe₂O₄ (x = 0.0, 0.1, 0.3, 0.5, 0.7 and 1.0) ferrite samples and their characterization by Mossbauer and positron annihilation techniques,
 M. Chakrabarti, D. Sanyal, and A. Chakrabarti
J. Phys. Cond. Matt. 19 (2007) 236210.
<http://dx.doi.org/10.1088/0953-8984/19/23/236210>
36. Defects and the optical absorption in nanocrystallineZnO,
 S. Dutta, S Chattopadhyay, M. Sutradhar, A. Sarkar, M. Chakrabarti,
 D. Sanyal and D. Jana
J. Phys. Cond. Matt. 19 (2007) 236218.
<https://doi.org/10.1088/0953-8984/19/23/236218>
37. Positron Scattering from Carbon dioxide,
 A. Zecca, C. Perazzolli, N. Moser, D. Sanyal, M. Chakrabarti and M. J. Brunger
Phys. Rev. A 74 (2006) 012707.
<https://doi.org/10.1103/PhysRevA.74.012707>

38. Positron Scattering from water,
 A. Zecca, D. Sanyal, M. Chakrabarti and M. J. Brunger
J. Phys. B **39** (2006) 1597.
<https://doi.org/10.1088/0953-4075/39/7/004>
39. Defect dynamics in annealed ZnO by positron annihilation spectroscopy,
 S. Dutta, M. Chakrabarti, S. Chattopadhyay, D. Jana, D. Sanyal, and A. Sarkar
J. App. Physics **98** (2005) 053513.
<https://doi.org/10.1063/1.2035308>
40. Studies of nanocrystalline ZrO₂ by positron annihilation technique,
 M. Chakrabarti, S. Chattopadhyay, A. Sarkar, D. Sanyal, S. Dechoudhury, D. Bhowmick
 and A. Chakrabarti,
J. Mat. Science **40** (2005) 5265.
<https://doi.org/10.1007/s10853-005-0743-3>
41. Grain size dependence of optical properties and positron annihilation parameters
 in Bi₂O₃ powder,
 M. Chakrabarti, S. Dutta, S. Chattapadhyay, A. Sarkar, D. Sanyal and A. Chakrabarti,
Nanotechnology **15** (2004) 1792.
<http://dx.doi.org/10.1088/0957-4484/15/12/017>
42. Doppler broadening measurements of positron annihilation in Bi-based high T_c
 superconductor along two different crystallographic directions,
 M. Chakrabarti, A. Sarkar, S. Chattapadhyay, D. Sanyal and A. Chakrabarti
Physica C **416** (2004) 25.
<http://dx.doi.org/10.1016/j.physc.2004.08.020>
43. Doppler broadening measurements of the electron-positron annihilation radiation in
 La_{0.7}Y_{0.3}Ca_{0.5}Ba_{1.5}Cu₃O_z superconductor,
 M. Chakrabarti, K. R. Mavani, S. Chattopadhyay, A. Sarkar and D. Sanyal,
Physics Letters A **329** (2004) 231.
<http://dx.doi.org/10.1016/j.physleta.2004.06.098>
44. Studies of the coincidence Doppler broadening of the electron-positron annihilation
 radiation in the single crystalline Bi₂Sr₂CaCu₂O_{8+α} superconductor,
 M. Chakrabarti, A. Sarkar, D. Sanyal, G.P. Karwasz and A. Zecca,
Physics Letters A **321** (2004) 376.
<http://dx.doi.org/10.1016/j.physleta.2003.11.062>
45. Anisotropy of the electron momentum distribution in Bi_xSr₂CaCu₂O_{8+α} superconductor
 studied by positron annihilation,
 M. Chakrabarti, A. Sarkar, S. Chattapadhyay, D. Sanyal, A. K. Pradhan,
 R. Bhattacharya and D. Banerjee,
Solid State Communications **128** (2003) 321.
<http://dx.doi.org/10.1016/j.ssc.2003.07.007>