

Curriculum Vitae



Contact information:

1. **Name:** Dr. Mohinder Singh
2. **Designation:** Assistant Professor
3. **Department:** Physics
4. **Institute:** Punjabi University Patiala
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6. **Contact:** +91-82848-58913
7. **Areas of specialization:** Nuclear and radiation physics,
Non-destructive testing

Personal information:

8. **Father's name:** S. Ashok Singh
9. **Mother's name:** Smt. Kamaljit Kaur
10. **Spouse' Name:** Mrs. Manjit Kaur
11. **Date of Birth:** 12th March, 1986
12. **Address for Correspondence:** Department of Physics,
Punjabi University, Patiala.

13. Academic Qualifications:

Sr. No	Degree	Year	Board/Univ./	Marks(%)	Division	Subjects Studied
1	B.Sc.	2007	Punjabi University Patiala	65.67	1 st	Physics, Chemistry, Mathematics, Punjabi, English.
2	M.Sc.	2009	Punjabi University Patiala	74.25	1 st	Physics
3.	GATE	2009			Qualified	
4.	CSIR (JRF)	2010	UGC-CSIR		Qualified	Physical Sciences
5.	Ph. D. (Course Work)	2013	Punjabi University Patiala		B+	Radiation Physics, Research Methodology, Techniques in Experimental physics.

14. Membership of Professional Bodies/Organizations

Life Member: Indian Society of Radiation Physics.

15. Details of Experience:

S. No	Name of the Inst./Employer	Position Held	Duration	Major Job Responsibilities and Nature of Experience
1.	Department of Physics Punjabi University Patiala	Assistant Professor (Physics)	Dec 2011 to till date	Teaching and Research

16. Published Work (Please specify numbers only) :

Research Papers (Total 15) i) National = 03
ii) International = 13

17. Number of guided/completed/pursuing students in Ph. D -- 01 (Pursuing)

18. Number of guided/completed/pursuing students in

MSc. dissertation work

-- 03 (completed), 03 (ongoing)

19. List of Papers/Courses taught at P.G. and U.G. Level

S. No.	Paper	Class
1.	Applied Physics-I	B. Tech
2.	Applied Physics-II	B. Tech
3.	Nuclear Physics (PHYM1104T)	MSc Physics
4.	Waves and Optics	FYI MSc. Programme in Physics & MD- FYIP Physical & Chemical Sciences
5.	Fundamentals of Quantum Mechanics	FYI MSc. Programme in Physics
6.	Classical Mechanics	FYI MSc. Programme in Physics & MSc. Physics (Hons.)
7.	Radiation Physics	MSc. Physics (Hons.)
8.	Waves and Optics	UG-PG-Prgm. (Hons. with Research) in Physics

20. Technical Proficiency

I possess extensive expertise in handling radioactive sources of varying strengths, utilizing NaI (Tl) scintillation detectors, and operating the associated electronic equipment. My technical proficiency includes the use of PC-based ORTEC Maestro-32 Multi-Channel Analyzer (MCA) software, along with proficiency in data analysis using Origin and other Windows-based tools. I am skilled in performing non-invasive measurements of materials using high-strength radioactive sources.

My research focuses on radiation interaction characteristics, interface determination in gamma-ray spectrometry, and Compton scattering techniques. In addition, it involves the characterization of tissue equivalent materials (phantoms) simulating real human body organs for getting comprehensive informative data related to deficiencies or diseases in patients. I have significant experience in generating multiple gamma energies from a single conventional radioisotope, surpassing the limitations of traditional sources.

In my role as an Assistant Professor, I teach various subjects such as Nuclear Physics, Classical Mechanics, Quantum Mechanics, Waves and Optics, and Engineering Physics at both graduate and postgraduate levels. Additionally, I actively contribute to departmental administration through roles in the Departmental Research Board, as a Subject Expert, and in areas such as hostel management, admissions, and examination preparation (including question paper setting and vetting).

Moreover, I have authored a book chapter and presented 14 papers in various conferences/symposia/seminars, along with this I have published 15 peer-reviewed research papers in national and international journals.

21. Administrative/Academic Experience

1. Worked as member of ACD of Department of basic and applied sciences.
2. Wardenship in a hostel in the university campus.
3. Member of various Departmental Committees (Admission Committee, Fee Concession Committee, Orientation Committee, Discipline Committee, Anti- Ragging).
4. Secretary Indian Society for Radiation Physics (ISRP).
5. Member and Secretary of ACD of Department of Physics for the session 2023-24

20. Citations of Research publications (as per Google Scholar)

	All	Since 2019
<u>Citations</u>	76	70
<u>h-index</u>	5	5
<u>i10-index</u>	3	3

21. List of Published Research Papers

(a) Published in National/International Journals.

1.	A Compton scattering technique to determine wood density and locating defects in it. Akash Tondon, Mohinder Singh , B. Singh, B. S. Sandhu AIP Conference Proceedings 1675 (2015) 020048
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	https://aip.scitation.org/doi/abs/10.1063/1.4929206
2.	Compton scattering technique in concentration and fluid-fluid interface measurements using low resolution detector. Akash Tondon, Mohinder Singh , B.S. Sandhu and Bhajan Singh NSRP-20 Conf. Proc. , ISBN 978-93-82845-96-6, (2015). https://www.ndt.net/search/ocs.php3?id=21219
3.	Use Of Gamma Ray Back Scattering For The Detection Of Foreign Body In Dalbergia Sissoo Wood Akash Tondon, Mohinder Singh , B. Singh, B. S. Sandhu Non-Destructive Evaluation (NDE)-INDIA (2016) https://doi.org/10.1016/j.apradiso.2017.08.031
4.	A Compton scattering technique for concentration and fluid-fluid interface measurements using NaI(Tl) detector Akash Tondon, Mohinder Singh , B. Singh, B. S. Sandhu Nuclear Instruments and Methods in Physics Research B 403 (2017) , 21–27, IF 1.3 https://doi.org/10.1016/j.nimb.2017.04.080
5.	Non-destructive study of wood using the Compton scattering technique Akash Tondon, Mohinder Singh , B. Singh, B. S. Sandhu Applied Radiation and Isotopes , 129 (2017), 204–210, IF 1.6 https://doi.org/10.1016/j.apradiso.2017.08.031
6.	Molar extinction coefficient of organic compounds as a function of effective atomic number Mohinder Singh , Akash Tondon, B. S. Sandhu, and Bhajan Singh AIP Conference Proceedings 1953 , (2018) 140129. https://doi.org/10.1063/1.5033304
7.	Effective Atomic Number Dependence of Radiological Parameters of Some Organic Compounds at 122 KeV Gamma Rays Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu Journal of Nuclear Physics, Material Sciences, Radiation and Applications , 5 (2018) 299-310 https://jnp.chitkara.edu.in/index.php/jnp/article/download/62/39
8.	Energy dependence of radiation interaction parameters of some organic Compounds Mohinder Singh , Akash Tondon, B. S. Sandhu, and Bhajan Singh Radiation Physics and Chemistry , 145 (2018) 80-88, IF 2.9 https://doi.org/10.1016/j.radphyschem.2017.12.020
9.	Effect of addition of cerium (III) nitrate hexahydrate on gamma ray interaction properties in acetone at various gamma energies obtained by Compton scattering technique Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu Chemical Physics 525 (2019) 110377, IF 2.3 https://doi.org/10.1016/j.chemphys.2019.05.004
10.	Importance of Voxel Size in Defect Localization Using Gamma-Ray Scattering Akash Tondon, Mohinder Singh , B. S. Sandhu, and Bhajan Singh Nuclear Science and Engineering (2019), 193 , 1265-1275., IF 1.2 https://doi.org/10.1080/00295639.2019.1614802

11.	Study of radiation interaction parameters for organic compounds at gamma photon energies different from available standard radioisotope. Mohinder Singh , Akash Tondon, B. S. Sandhu, and Bhajan Singh Chinese Journal of Physics 65 (2020) 221–234. , IF 5.0 https://doi.org/10.1016/j.cjph.2020.03.009
12.	Radiation Interaction Characteristics of Solutions of La(NO ₃) ₃ .6H ₂ O and Sm(NO ₃) ₃ .6H ₂ O in Acetone Using Compton Scattering Technique. Mohinder Singh , Akash Tondon, B. S. Sandhu, and Bhajan Singh. Nuclear Science and Engineering (2022) 196, 1172-1193., IF 1.2 https://doi.org/10.1080/00295639.2022.2067737
13.	Estimating the mineral density of trabecular bone using Compton scattering Akash Tondon, Mohinder Singh , Bhajan Singh and B. S. Sandhu. Applied Radiation and Isotopes (2023) 191, 110530, IF 1.6 https://doi.org/10.1016/j.apradiso.2022.110530 .
14.	Compton scattering geometry: a tool to study radiation interaction characteristics of rare earth compounds doped in low-Z organic compound. Mohinder Singh , Akash Tondon, B. S. Sandhu, and Bhajan Singh. Radiochimica acta (2023) IF- 2.0 https://doi.org/10.1515/ract-2022-0094
15.	Portable gamma-ray instrumentation for inspecting pipe wall thickness: Monte Carlo and experimental investigations. Amandeep Sharma, Mohinder Singh , Bhajan Singh and B. S. Sandhu, Radiation Measurements (2024) 174, 107132, IF- 1.6 https://doi.org/10.1016/j.radmeas.2024.107132
16.	Efficacy of advanced concretes for attenuation of ionizing radiations: A comprehensive review and comparison. Rajni Devi, Poonamjot, Mohinder Singh , Amandeep Sharma Progress in Nuclear Energy (2025) 178, 105502. https://doi.org/10.1016/j.pnucene.2024.105502

(b) **Papers in the Symposia/Conferences/Seminars:**

1.	Evaluation of Radiological parameters for various organic compounds at different Energies. Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu Two Days National Conference on “Research Trends In Physics And Electronics (NPE-2016)” S. G. G. S. Khalsa College Mahilpur, Nov. 25, 26 (2016)
2.	Variation of mass attenuation coefficient of Organic compounds as a function of Effective atomic number at different energies. Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu 20 th Punjab Science Congress. IET Bhaddal, Ropar, Punjab. Feb, 7-9, 2017.
3.	Variation of mass attenuation coefficient of Organic compounds as a function of Effective atomic number at different energies. Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu 5th International Conference on Advancements in Engineering & Technology-2017(ICAET), B. G. I. E.T., Sangrur, Punjab. March 24, 25 (2017).

4.	Energy dependence of Effective Atomic Number and Electron Density for various Organic compounds. Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu International Conference on Advancements in Science and Technology (ICAST), Mohali, April, 20, 21 (2017).
5.	Energy dependence of molar extinction coefficient and effective atomic number of organic compounds. Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu Two-day National Seminar on Recent Trends in Chemistry Chemistry department, Punjabi University Patiala, 15-16 Feb (2018).
6.	Z_{eff} dependence of radiological parameters at 511 keV gamma energy. Mohinder Singh , Akash Tondon, Bhajan Singh and B. S. Sandhu 21 st Symposium on Radiation Physics (NSRP21) Indore, March 5-7 (2018).
7.	Compton scattering: A tool to study the radiation interaction parameters for low-Z organic compounds. Mohinder Singh , Akash Tondon, B. S. Sandhu and Bhajan Singh 23 rd Punjab Science Congress, February 7-9 (2020), SLIET, Longowal, Sangrur.
8.	Study of radiation interaction parameters using Compton scattering technique. M. Singh , A. Tondon, B. S. Sandhu and B. Singh 22 nd National Symposium on Radiation Physics (NSRP-22) November 8-10, 2019 Jawaharlal Nehru University, New Delhi, India
9.	Experimental evaluation of radiation transmission factors for some polymeric materials at six gamma energies obtained by Compton scattering technique. Mohinder Singh , Amandeep Sharma, Bhajan Singh, B. S. Sandhu 23 rd National Symposium on Radiation Physics (NSRP-23) to be held at University of Mysore, Manasagangotri, Mysuru on January 19-21, 2023
10.	Evaluation of transmission factors by Compton Scattering technique for some Inorganic compounds. Mohinder Singh , Rajni Devi, B. S. Sandhu and Bhajan Singh One Day National Seminar on Condensed Matter Physics and Materials (CMPM-2023) on 8th May, 2023, Science Auditorium, Punjabi University, Patiala.
11.	Evaluation of Transmission Factors by Compton Scattering Technique for Some Inorganic Compounds. Mohinder Singh , Rajni Devi, Bhajan Singh, and B. S. Sandhu, One day National Seminar on Condensed Matter Physics and Materials (CMPM-2023), May 8, 2023, organized by the Department of Physics, Punjabi University, Patiala (Punjab) India.
12.	Radiological Parameters of Tissue Equivalents for Nuclear Medicine Applications: A Review. Rajni Devi, Mohinder Singh , Amandeep Sharma, Recent trends in Basic and Applied Nuclear Physics, held on November 22-23, 2023, at the Department of Physics, Punjab University, Chandigarh-160014, India.
13.	Radiation Absorption Characteristics of a Biomaterial Composed of Wood Sawdust for Medical Phantoms. Rajni Devi, Amandeep Sharma, Mohinder Singh , 2 nd International Conference on Advanced Materials and Devices (IC-AMDFA-2024), held on 04-05 October 2024, organized by the Department of Physics, University Institute of Sciences, Chandigarh University (Punjab) India.

14.	Tissue-Simulating Materials in Medical Sciences: A Review. Jaspreet Kaur, Ravneet Kaur, Rajni Devi, Mohinder Singh , Amandeep Sharma, 2nd International Conference on Advanced Materials and Devices (IC-AMDFA-2024), held on 04-05 October 2024, organized by the Department of Physics, University Institute of Sciences, Chandigarh University (Punjab) India.
15.	Qualitative Analysis of Bone-Tissue Equivalent Materials. Isha, Jobanpreet Kaur, Rajni Devi, Mohinder Singh National Conference cum Workshop on Computational and Experimental Techniques for Advanced Functional Materials (NCCET-AFM 2025), held on 27-28 February 2025, organized by the Department of physics, Panjab University, Chandigarh.
16.	The Role of Phantom Materials Simulating Human Body Tissues in Medical Sciences. Ravneet Kaur, Jaspreet Kaur, Rajni Devi, Mohinder Singh . National Conference cum Workshop on Computational and Experimental Techniques for Advanced Functional Materials (NCCET-AFM 2025), held on 27-28 February 2025, organized by the Department of physics, Panjab University, Chandigarh.
17.	Radiological Analysis of Gelatin-Based Phantoms Simulating Breast Tissue. Rajni Devi, Mohinder Singh , Amandeep Sharma 24th National Symposium on Radiation Physics (NSRP 24) on Reactor and Radiation Physics, held on 27-29 March, 2025, Organized by Indian Society for Radiation Physics (ISRP) In association with Bhabha Atomic Research Centre Board of Research in Nuclear Science, Mumbai.
18.	Dosimetric Parameters of Bone Tissue Mimicking Materials for Gamma Photons. Amandeep Sharma, Rajni Devi, Mohinder Singh , and B.S.Sandhu 24th National Symposium on Radiation Physics (NSRP 24) on Reactor and Radiation Physics, held on 27-29 March, 2025, Organized by Indian Society for Radiation Physics (ISRP) In association with Bhabha Atomic Research Centre Board of Research in Nuclear Science, Mumbai.

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