




Faculty Profile on University Website

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Title	Dr.	First Name	Om Pal	Last Name	Singh	Photograph
Designation		Assistant Professor				
Department		Physics, Constituent Government College, Puranpur, Pilibhit (U.P.)				
Address (Campus)		Constituent Government College, Puranpur, Pilibhit (U.P.)				
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Educational Qualifications (Graduation Onwards)						
Course/Degree	Institution	Year	Details/Thesis Topic/Subjects			
B.Sc.	Bareilly College, Bareilly	2007	Physics, Mathematics			
M.Sc.	M.J.P.R.U. Campus, Bareilly	2009	Applied Physics			
Ph.D.	Academy of Scientific & innovative Research	2017	Thesis Topic: Effect of sodium on optical, structural, morphological and electronic properties of $\text{Cu}_2\text{ZnSn}(\text{S}/\text{Se})_4$ thin films for electronic device applications			
Career Profile						
Organization / Institution	Designation	Duration	Role			
Constituent Government College, Puranpur, Pilibhit (U.P.)	Assistant Professor	Dec., 2022 to continue	Teaching cum Research			
University of Brescia	Postdoctoral Fellow	Nov., 2023 to Oct., 2024	Research			
University of Verona, Italy	Postdoctoral Fellow	May, 2019 to April, 2020	Research			
Institute of Atomic & Molecular Science, Taipei (Taiwan)	Postdoctoral Fellow	Jul., 2017 to Sept., 2017	Research			
Research Interests / Specialization						
<ul style="list-style-type: none"> Compound Semiconductor materials, Thin Film Solar cells: Structural, Semiconducting properties of Inorganic compound semiconductors (CIGS/CZTS/CdTe) for photovoltaic applications. Development of Thin Film Solar Cell Fabrication and Photodetector Fabrication using several deposition techniques and steps. Near Field Communication device development and fabrication. Development of chemical sensors based on metal oxide heterostructures. 						
Teaching Experience (Subjects/Courses Taught)						
One years (Physics/U.G.&P.G. Courses)						
Honors & Awards						
<ul style="list-style-type: none"> Junior Research Fellowship (Physical Science) by CSIR-UGC - 2011 GATE -2011 in Physics conducted by IIT's and provided by AICTE New Delhi, India. 						
Publications /Academic Activities (Numbers Only)						

Books & Monographs (Single Author)	00	Research Papers Published in International Journals	24	Papers Presented in Seminars/ Conferences	04	Seminars/ Conferences Organized	00	Research Projects (Completed)	00
Books (Co-authored)	00	Research Papers Published in Other Journals	01	Seminar/ Conferences Attended	04	Workshops Organized	00	Research Projects (Ongoing)	00
Books (Edited)	00	Articles Published in Popular Fora, e.g., Websites, Blogs, Newspapers, Magazines etc.	00	Sessions Chaird in Seminars/ Conferences	00	Membership of Academic/ Professional Bodies	00	Foreign Countries Visited for Academic Assignments	02
Chapters in Edited Books	02			Resource Lectures Delivered	00				

Details of Publications /Academic Activities (2010 Onwards)

(a) Books / Monographs: Book Chapter (Co Authored)

<u>Year of Publication</u>	<u>Title</u>	<u>Publisher</u>	<u>ISBN</u>	<u>Co-Author (s) (if any)</u>
2018	Advances in Thin Film Solar Cells	American Scientific Publisher	1-58883-213-9	Yes
2018	The Role of Scanning Electron Microscope (SEM) in Nanotechnology	American Scientific Publisher	1-58883-217-1	Yes

(b) Papers Published in Indexed/ Peer Reviewed Journals

- Muhunthan Nadarajah, **OP Singh**, Kuldeep Singh Gour, Vidya Nand Singh, Study of the Electrical Properties of Cu₂ZnSnS₄ (CZTS) Thin Film Using Atomic Force Microscopy (AFM) Techniques, Journal of Nanoscience and Nanotechnology 20, (2020) 3925-3928. DOI: <https://doi.org/10.1166/jnn.2020.17529>
- KS Gour, Biplab Bhattacharyya, **OP Singh**, AK Yadav, Sudhir Husale, VN Singh, Nanostructured Cu₂ZnSnS₄ (CZTS) thin film for self-powered broadband photodetection, Journal of Alloys and Compounds 735 (2018) 285-290. <http://doi.org/10.1016/j.jallcom.2017.11.079>
- O.P. Singh**, Kuldeep Singh Gour, Rahul Parmar, Vidya Nand Singh, Reactive Sputtering Technique for Kesterite and Chalcogenide Based Thin Film Solar Cells, Journal of Nanoscience and Nanotechnology 18, (2018) 7670-7681, <http://doi.org/10.1166/jnn.2018.16089>
- KS Gour, **O.P. Singh**, JS Tawale, VN Singh, Silver (Ag) incorporated Cu₂ZnSnS₄ thin film for improved optical and morphological properties, Superlattices and Microstructures 120, (2018) 54-59, <http://doi.org/10.1016/j.spmi.2018.05.012>
- KS Gour, AK Yadav, **O.P. Singh**, VN Singh, Na incorporated improved properties of Cu₂ZnSnS₄ (CZTS) thin film by DC sputtering, Vacuum 154, (2018) 148-153, <http://doi.org/10.1016/j.vacuum.2018.05.007>
- KS Gour, **O.P. Singh**, AK Yadav, R Parmar, VN Singh, Effect of NaF evaporation on morphological and structural properties of Cu₂ZnSnSe₄ (CZTSe) thin film deposited by sputtering from a single compound target, Journal of Alloys and Compounds 718 (2018) 231-235, DOI:doi.org/10.1016/j.jallcom.2017.05.098
- K.S. Gour, **O.P. Singh**, Biplab Bhattacharyya, Rahul Parmar, Sudhir Husale, TD Senguttuvan and Vidya N Singh, Enhanced photoresponse of Cu₂ZnSn(S,Se)₄ based photodetector in visible range, J. Alloys Compd. 694 (2017) 119-123., DOI:10.1016/j.jallcom.2016.09.299
- O.P. Singh**, N. Muhunthan, K. S. Gour, R. Parmar, M. Dalai, P. Kulriya, S. Pillai and V.N. Singh, "Effect of sputter deposited Zn precursor film thickness and annealing time on the properties of Cu₂ZnSnS₄ thin films deposited by sequential reactive sputtering of metal targets", Materials Science in Semiconductor Processing, 2016, 52, 38-45, DOI: 10.1016/j.mssp.2016.05.012

9. **O.P. Singh**, A. Sharma, K. S. Gour, S. Husale and V.N. Singh, "Fast switching response of Na-doped CZTS photodetector from visible to NIR range", *Solar Energy Materials and Solar Cells*, 2016, 157, 28-34, doi:10.1016/j.solmat.2016.04.058
10. K.S. Gour, R. Parmar, **O.P. Singh** and V.N. Singh, "Optimizing CuInGaSe₂ Thin Films Grown by Selenization of CuIn/CuGa Multilayers for Solar Cell Applications", *Advanced Science, Engineering and Medicine*, 2016, 8, 314-318, DOI: <http://dx.doi.org/10.1166/ asem.2016.1860>
11. **O.P. Singh**, K.S. Gour, R. Parmar and V. N. Singh, "Sodium induced grain growth, defect passivation and enhancement in the photovoltaic properties of Cu₂ZnSnS₄ thin film solar cell", *Materials Chemistry and Physics*, 10.1016/j.matchemphys.2016.04.030
12. M. K. Thakur, **O.P. Singh**, K. Thakur , R. Parmar, K. S. Gour, N. Muhunthan, S. Singh, Dinesh Singh, N. Vijayan, H. K. Singh and V.N. Sing "Effect of substrate on the structural and electrical properties of Mo thin films", *Advanced Materials Letters*, doi:10.5185/amlett.2016.5965
13. **O.P. Singh**, R Parmar, K.S. Gour, MK Dalai, Jai Tawale, SP Singh, Vidya Nand Singh, "Synthesis and characterization of petal type CZTS by stacked layer reactive sputtering", *Superlattices and Microstructures*, 88 (2015) 281-286.
14. **O.P. Singh**, N. Vijayan, K.N. Sood, B.P. Singh, V.N. Singh, "Controlled substitution of S by Se in reactively sputtered CZTSSe thin films for solar cells" *Journal of Alloys and Compounds*, 648 (2015) 595-600.
15. A. Yadav, G. Kedawat, P. Kumar, A. Anshul, A.D. Deshmukh, **O.P. Singh**, R.K. Gupta, S.S. Amritphale, G. Gupta, V.N. Singh and B.K. Gupta, "Luminomagnetic bifunctionality of Mn²⁺-bonded graphene oxide /reduced graphene oxide two dimensional nanosheets", *Nanoscale* 2015, 7, 12498-12509.
16. **O.P. Singh**, N. Muhunthan, V.N. Singh, "Investigation of Cu₂ZnSnS₄ thin film by scanning Kelvin force microscopy", *Indian Journal of Pure and Applied Physics*, 53 (2015) 691-695.
17. N. Muhunthan, **O.P. Singh**, V. Toutam, and V.N. Singh, "Electrical Characterization of Grain Boundaries of CZTS thin films using Conductive Atomic Force Microscopy Techniques" *Materials Research Bulletin*, 2015, 70, 373-378.
18. N. Muhunthan, **O.P. Singh**, V.N. Singh, K.N. Sood and Rashmi, "Electric field-effect-assisted persistent photoconductivity in CZTS," *Advanced Materials Letters*, 2015, 6 (4), 290-293
19. L. Arora, P. Gupta, N. Chhikara, **O.P. Singh**, N. Muhunthan, V.N. Singh, B.P. Singh, K. Jain, and S. Chand, "Green synthesis of wurtzite copper zinc tin sulfide nanocones for improved solar photovoltaic utilization" *Applied Nanoscience*, 2015, 5(2) 163-167
20. **O.P. Singh**, N. Muhunthan, V.N. Singh, B.P. Singh, "Effect of annealing time on the composition, microstructure and band gap of copper zinc tin sulfide thin films" *Advanced Materials Letters*, 2015, 6 (1), 2-7
21. **O.P. Singh**, N. Muhunthan, B.P. Singh and V.N. Singh, "One step deposition of Cu₂ZnSnS₄ thin films using a ceramic quaternary target", *Advanced Science, Engineering and Medicine*, 2014, 6 (12), 1285-1289
22. N. Muhunthan, **O.P. Singh**, M.K. Thakur, P. Karthikeyan, D. Singh, M. Saravanan, V.N. Singh, "Interfacial Properties of CZTS Thin Film Solar Cell" *Journal of Solar Energy*, 2014, 476123
23. M. Dhankhar, **O.P. Singh**, V.N. Singh, "Physical principles of losses in thin film solar cells and efficiency enhancement methods" *Renewable and Sustainable Energy Reviews*, 2014, 40, 214- 223
24. **O.P. Singh**, N. Muhunthan, V.N. Singh, K. Samanta, N. Dilawar, "Effect of temperature on thermal expansion and anharmonicity in Cu₂ZnSnS₄ thin films grown by co-sputtering and sulfurization" *Materials Chemistry and Physics* 2014, 146(3), 452-455

25. N. Muhunthan, **O.P. Singh**, Son Singh, and V.N. Singh, “Growth of CZTS thin films by co-sputtering of metal targets and sulfurization in H₂S” International Journal of Photoenergy, 2013, 752012, <http://dx.doi.org/10.1155/2013/752012>

(c) Articles

NIL

(d) Seminar/Conference Presentations

N. Muhunthan, **O.P. Singh** and V.N. Singh, “Growth of CZTS by co-sputtering and sulfurization for solar cell applications”, SPIE Micro+ Nano Materials, Devices, and Applications, 2013, 89232H-89232H-10.

1. N. Muhunthan, **O.P. Singh**, and V.N. Singh, “Growth and characterization of Cu₂ZnSnS₄ for thin film applications”, International conference SPPS 2013, ISM Dhanbad, India ISBN: 978-93-81212-48-6.
2. N. Muhunthan, **O.P. Singh**, Son Singh, S. Kala and V.N. Singh, “Synthesis and characterization of copper zinc tin sulfide thin films for solar cell”, TAPSUN conference- 2012, 4-5th NPL, Delhi.

N. Muhunthan, **O.P. Singh**, and V.N. Singh, “Co-sputtering technique for Cu₂ZnSnS₄ based thin film solar cell development”, International conference on Advanced Materials and Applications, March 24-26, 2014, Organized by Centre of Materials Science, University of Allahabad, India.

(e) Resource Lectures Delivered

NIL

(f) Seminars/Conferences/Workshops Organized

NIL

(g) Public Service / University Service / Consulting Activity

NIL

(h) Memberships of Academic/Professional Bodies

NIL

Projects (With Title, Year, Grants, Funding Agency and Collaborations)

NIL

Administrative Positions/Assignments Held

NIL

Academic Foreign Visits

- Institute of Atomic & Molecular Science, Taiwan (Research) (July, 2017-Sept, 2017)
- University of Verona, Italy (Research) (May, 2019 – April, 2020)
- University of Brescia, Italy (Research) (Nov., 2023 – Oct., 2024)

Any Other Details

Reviewer of Peer reviewed Journals:

- Journal of Alloys and Compounds
- Materials Science in Semiconductor Processing
- RSC Advances and Journal of Nanomaterials



Signature of Faculty Member