DR. NEHA JAIN

Ph.D. Physics

Email ID: nehachitora@gmail.com

EXPERIENCE

Two years teaching experience as Guest Faculty, Department of Physics, Dr. Harisingh Gour Vishwavidyalaya, Sagar, Madhya Pradesh, India.

Working on Rare earth doped Metal Oxide nano-phosphors for temperature sensor and bio-imaging applications.

I have published seven research papers in as first author in peer reviewed journals.

EDUCATION

Ph.D. (Physics) • 2020 • Dr. Harisingh Gour Vishwavidyalaya, Sagar, Madhya Pradesh, India
Thesis Title: "Study of Some Rare Earth doped Metal Oxide Nano-phosphors and their Applications".
Ph.D. Awarded on 18/09/2020.

M. Sc. (Physics) • 2014 • Dr. HarisinghGour Vishwavidyalaya, Sagar, Madhya Pradesh.
CGPA 8.92 / 9.00, Equivalent Percentage 95.87%, First class
Secure Second rank in the class.

B. Sc. (Physics, Chemistry, Mathematics) • 2012 • Dr. HarisinghGour Vishwavidyalaya, Sagar, Madhya Pradesh.
CGPA 8.59 / 9.00, Equivalent Percentage 78.69%, First class

Higher Secondary (Phys., Chem., Maths) • 2009 • MP Board
82.60%, First class
Received central sector scholarship (center government scheme).

High School (All subjects) • 2007 • MP Board
82.80%, First class

ACHIEVEMENTS AND AWARDS

1. **CSIR JRF NET** in Physical Sciences has been qualified and secured rank 182. Exam held on 17 December 2017.
2. Selected for **Maulana Azad National Fellowship** for the year 2017-18.

SCIENTIFIC MEMBERSHIPS

- Lifetime membership in Indian Science Congress.
- One-year membership in Indian Crystallography Association (ICA) 2017-18.

EXPERIMENTAL EXPERTISE

SYNTHESIS TECHNIQUES:

- Sol - Gel,
- Polyol Method,
- Solvothermal method,
- Chemical Precipitation,
- Solid State Reactions,
- Hydrothermal,
- Ball Milling
- Spin Coating Techniques.

EXPERIMENTAL LAB SKILLS:

- X-ray Diffraction (XRD) (Bruker D8 Advance),
- Simultaneous Thermal Analyzer (STA) [DSC/TG] (NETZCH STA 449 F1 Jupiter),
- Raman Spectroscopy (RENISHAW),
- Ellipsometer Spectroscopy (J. A. Woollam),
- UV-Visible (UV-2401PC UV-VIS recording spectrometer)
- Ball Milling (FRITSCH Pulverisette 7).
- Fluorescence spectrometer (Horiba, Fluromax-4)

THEORETICAL SIMULATION TECHNIQUES KNOWN:

- CIE parameter calculation using **origin/ CIE color calculator**
- Lattice parameter calculation using **FULLPROF**

LIST OF PUBLICATIONS

FIRST AND PRINCIPLE AUTHOR

1. Phase Transition and Enhanced Photoluminescence Behaviour of Rare Earth Activated $ZnMoO_4$@(GO/r/GO) Nanocomposites
   Neha Jain, Shikha Mishra, Khalid BinMasood, Rajan K Singh, Prince Kumar Jain, Ashutosh Pandey, Jai Singh
   Materials Research Bulletin 09/2021, 145: 111551
   DOI: https://doi.org/10.1016/j.materresbull.2021.111551
   ISSN No. 0025-5408
   Impact Factor: 5.60

2. Improved NIR emission from Tb3+, Yb3+ and Nd3+ co-doped La2O3 nano-phosphor
   Neha Jain, Rajan Kumar Singh, Khalid Bin Masood, Jai Singh
   SN Applied Sciences 02/2020, 2: 410
   DOI: https://doi.org/10.1007/s42452-020-2185-6
   ISSN No. 2523-3971

3. Enhanced Temperature-Sensing Behavior of Ho^{3+} –Yb^{3+} -Codoped $CaTiO_3$ and Its Hybrid Formation with Fe_3O_4 Nanoparticles for Hyperthermia
   Neha Jain, Rajan K. Singh, Bheeshma Pratap Singh, Amit Srivastava, R. A. Singh, Jai Singh
   ACS Omega, 04/2019; 4(4):7482-7491
   DOI:10.1021/acsomega.9b00184
   ISSN No. 2470-1343
   Impact Factor: 4.132

4. Synthesis and Rational design of Europium and Lithium Doped Sodium Zinc Molybdate with Red Emission for Optical Imaging
   Neha Jain, Ruchi Paroha, R. K. Singh, S.K. Mishra, S. K. Chaurasiya, R. A. Singh, Jai Singh
   Scientific Reports 02/2019; 9(1):2472
   DOI:10.1038/s41598-019-38787-1
   ISSN No. 2045-2322
   Impact Factor: 4.996

5. Color tunable emission through energy transfer from Yb^{3+} co-doped $SrSnO_3$:Ho^{3+} perovskite nano-phosphor
   Neha JainR. K. Singh**,** S. Sinha, J. Singh, R. A. Singh
   Appl. Nanoscience, vol. 8, (2018) 1267-1278
   Doi: 10.1007/s13204-018-0778-9
   ISSN No. 2190-5509
   Impact Factor: 3.869

6. Prominent blue emission through Tb^{3+} doped La_2O_3 nano-phosphors for white LEDs
   Neha Jain, R. K. Singh, J. Singh
   Physica B Condensed Matter, 70J, 2018, 538
   doi: 10.1016/j.physb.2018.03.014
   ISSN: 0921-4526
   Impact Factor: 2.988

7. Enhanced photoluminescence behavior of Eu^{3+} activated $ZnMoO_4$ nanophosphors via Tb^{3+} co-doping for light emitting diode
   Neha Jain, Rajan K. Singh**,**Bheeshma Pratap Singh, Jai Singh, R.A. Singh
   Journal of Luminescence, 188, 2017, 504–513
   doi:10.1016/j.jlumin.2017.05.007
   ISSN No. 0022-2313
   Impact Factor: 4.171

CONTRIBUTORY PAPERS (CO-AUTHOR)

1. Progress of Backlight Devices: Emergence of Halide Perovskite Quantum Dots/Nanomaterials
   Rajan Kumar Singh, Li-Hsuan Chen, Anupriya Singh, Neha Jain3, Jai Singh and Chung-Hsin Lu, Front. Nanotechnol., 06/ 2022 Sec. Nanotechnology for Energy Applications
   DOI: https://doi.org/10.3389/fnano.2022.863312
   Cite score 1.1
2. Structural, morphological and thermodynamic parameters investigation of tunable $MAPb_{1-x}Cd_xBr_{3-2x}I_{2x}$ hybrid perovskite
   Rajan Kumar Singh, Pushkal Sharma, Chung- Hsin Lu, Ranveer Kumar, **Neha Jain**, Jai Singh
   Journal of Alloys and Compounds 06/ 2021, 866:158936
   DOI: https://doi.org/10.1016/j.jallcom.2021.158936
   ISSN No. 0925-8388
   Impact Factor: 6.371

3. Incorporation of zinc ions towards low toxicity and high stability of organic-inorganic methyl ammonium lead bromide perovskite QDs via ultrasonication route for white-LEDs
   Rajan Kumar Singh, Pushkal Sharma, Chung-Hsin Lu, Ranveer Kumar, Sudipta Som, Somrita Dutta, **Neha Jain**, Mohan Lal Meena, Jai Singh, Teng-Ming Chen
   Journal of Molecular Liquids, 09/2021, 337:116557
   DOI: https://doi.org/10.1016/j.molliq.2021.116557
   ISSN No. 0167-7322
   Impact Factor: 6.63

4. Exploration of structural, thermal stability and band-gap tunability of organic and inorganic mixed cation $(MA)_{1-x}Cs_xPbBr_3$ perovskite harvester via ultrasonication synthesis route
   Rajan Kumar Singh, Khalid Bin Masood, **Neha Jain**, Radha Tamrakar, Jai Singh and Ranveer Kumar
   J. Phys.: Condens. Matter 05/2021, 33: 245705
   DOI: https://doi.org/10.1088/1361-648X/abf51d
   ISSN No. 1361-648X
   Impact Factor: 2.745

5. Near-infrared light-mediated Er^{3+} and Yb^{3+} co-doped $CaTi_4O_9$ for optical temperature sensing behavior
   Prashansha Singh, **Neha Jain**, Anish Kumar Tiwari, Shraddha Shukla, Vikas Baranwala Jai Singh, Avinash C.Pandey
   Journal of Luminescence 05/ 2021, 233:117737
   DOI: https://doi.org/10.1016/j.jlumin.2020.117737
   ISSN No. 0022-2313
   Impact Factor: 4.17

6. $CH_3NH_3Pb_{1-x}Co_xBr_{3-2x}Cl_{2x}$ Perovskite Quantum Dots for Wide-Color Backlighting
   Rajan K. Singh, Pushkal Sharma, Ranveer Kumar, Sudipta Som, Somrita Dutta, **Neha Jain**, Rajneesh Chaurasiya, Mohan Lal Meena, Jian-Syun Ho, Shu-Wen Dai, Jai Singh, Chung-Hsin Lu, and Hao-Wu Lin
   ACS Appl. Nano Mater.01/ 2021, 4(1):717–728
   DOI: https://doi.org/10.1021/acsanm.0c03019
   ISSN No. 2574-0970
   Impact Factor: 5.64

7. Rapid and room temperature synthesis of $MAPb_{1-x}Sn_xBr_{3-2x}Cl_{2x}$ perovskite quantum dots with enhanced lifetime in warm WLEDs: A step towards environmental friendly perovskite light harvester
   Rajan Kumar Singh, Sudipta Som, Somrita Dutta, **Neha Jain**, Jai Singh, Ranveer Kumar, Chung-Hsin Lu
   Chemical Engineering Journal, 07/2020, 391:123629
   DOI: https://doi.org/10.1016/j.cej.2019.123629
   ISSN No. 13858947
   Impact Factor: 16.74

8. Electrochemical performance of pre-lithiated $ZnMoO_4$ and r-GO@$ZnMoO_4$ composite anode for lithium-ion battery application
   Khalid Bin Masood, Golu Parte, Neha Jain, Pravin K. Dwivedi, Pushpendra Kumar, Manjusha V. Shelke, R.P. Patel, Jai Singh
   Journal of the Taiwan Institute of Chemical Engineers, 07/ 2020, 112: 60-66
   ISSN No. 1876-1070

Impact Factor: 5.477

9. Electrochemical performance of Bi2Te3/GO composite anode for LIB application
   Khalid B. Masood, **Neha Jain**, Jai Singh
   International Journal of Applied Ceramic Technology, 06/ 2020, 17 (3):1422-1429
   DOI: https://doi.org/10.1111/ijac.13445
   ISSN No.: 1546542X
   Impact Factor: 2.328

10. A Rapid and Efficient Biosynthesis of Metallic Nanoparticles Using Aqueous Extract of Chia (Salvia hispanica L.) Seeds
    Neha Joshi, Abhishek Pathak, Rajaneesh Anupam, **Neha Jain**, Jai Singh, Chandrama Prakash Upadhyaya
    BioNanoScience, 08/2019
    DOI: https://doi.org/10.1007/s12668-019-00672-6
    ISSN: 2191-1649
    Impact Factor: 1.174

11. Rapid synthesis of hybrid methylammonium lead iodide perovskite quantum dots and rich MnI_2 substitution favouring Pb-free warm white LED applications
    Rajan K. Singh, SudiptaSom, Somrita Dutta, **Neha Jain**, Ranveer Kumar, Jai Singh, Mei-TsanKuo and T. M. Chen
    RSC, Nanoscale Advances 06/2019;
    DOI:10.1039/C9NA00330D
    ISSN No. 2516-0230
    Impact Factor: 5.598

12. Exploring the impact of the Pb^{2+} substitution by Cd^{2+} on the structural and morphological properties of $CH_3NH_3PbI_3$ perovskite
    Rajan Kumar Singh, Ranveer Kumar, **Neha Jain**, Mei-TsanKuo, Chandrama Prakash Upadhyaya, Jai Singh
    Applied Nanoscience, 04/2019
    DOI:10.1007/s13204-019-01021-5
    ISSN No. 2190-5509
    Impact Factor: 3.869

13. Ultra-bright emission from Sr doped TiO2 nanoparticles through r-GO conjugation
    Sanhita Mandal, **Neha Jain**, Mukesh Kumar Pandey, SS Sreejakumari, Prashant Shukla, Anupama Chanda, SudiptaSom, Subrata Das, Jai Singh
    Royal Society Open Science, 2019 6: 190100.
    DOI: https://doi.org/10.1098/rsos.190100
    Impact factor: 3.653

14. Investigation of optical and dielectrical properties of $CSPbI_3$ inorganic lead iodide perovskite thin film
    Rajan Kr. Singh, Ranveer Kumar,Amit Kumar, **Neha Jain**, Rajiv Kr. Singh, and Jai Singh

Journal of the Taiwan Institute of Chemical Engineers, 96, 538-542, 2019DOI: 10.1016/j.jtice.2018.11.001
ISSN No. 1876-1070
Impact Factor: 5.477

15. Novel synthesis rout of methyl ammonium bromide and effect of particle size on structural, optical and thermal behavior of $MAPbBr_3$organometalic perovskite
Rajan Kr. Singh, Ranveer Kumar,Amit Kumar, **Neha Jain**, Rajiv Kr. Singh, and Jai Singh
Journal of alloy and compound, 743, 2018, 728-736.
DOI: 10.1016/j.jallcom.2018.01.355
ISSN No. 0925-8388
Impact Factor: 6.371

16. Biosynthesis of silver nanoparticles using Carissa carandas berries and its potential antibacterial activities
Neha Joshi, **Neha Jain**, Abhishek Pathak, Jai Singh, Ram Prasad, Chandrama Prakash Upadhyaya
Journal of Sol-Gel Science and Technology, (Springer), 03/2018
DOI: https://doi.org/10.1007/s10971-018-4666-2
ISSN: 1573-4846
Impact Factor: 2.606

17. Stability Behavior of Chemically Synthesized Organic Electrolyte Salts and Methylammonium Lead Halide Perovskite Light Harvester
Rajan. Kr. Singh, **Neha Jain**, J. Singh, R. Kumar
Advanced Materials Letters 2017, 8(6), 707-711
DOI: 10.5185/amlett.2016.6953
ISSN No. 0976-3961
Impact Factor: 1.352

LIST OF PROCEEDINGS

1. Study of Ce3+, Dy3+ and Eu3+ activated SrSnO3 for white LEDs,
Neha Jain, Deepak Kumar Pandey, Rajan Kumar Singh, Jai Singh, R. A. Singh.
AIP Conference Proceedings, 1953 (1), 030125, 2018. DOI:10.1063/1.5032460

2. Study of morphological changes in scattering and optically anisotropic medium through correlation images,
Neha Jain, Prashant Shukla, and Jai Singh
AIP Conference Proceedings 1953, 140094 (2018); DOI: 10.1063/1.5033269

3. Structural and thermodynamic aspects of organic-inorganic mixed halide ($CH_3NH_3PbI_{3-x}Br_x$) perovskite,
Rajan. Kr. Singh, S. R. Das, **Neha Jain**, J. Singh, and R. Kumar
AIP Conference Proceedings, 1953, 080019 (2018); DOI: 10.1063/1.5032825

4. Solution Processed Hybrid Organic-Inorganic $CH_3NH_3PbI_3$ Perovskite Material and Optical Properties,
   Rajan. Kr. Singh, A. Kumar, **Neha Jain**, J. Singh, R. K. Singh and R. Kumar,ElsevierMaterials Today: Proceedings,4 (2017) 12661–12665.DOI: 10.1016/j.matpr.2017.10.079

LIST OF BOOK CHAPTERS

1. **Synthesis of Two-Dimensional (2D)Graphene**, **Neha Jain**, Praveen K. Litoriya, Khalid Bin Masood, Sanjay Pathak, Jai Singh, Book entitled "Carrier Modulation in Graphene and Its Applications" Jenny Stanford Publishing Pte. Ltd. 2021 **ISBN**: 9781003160281

2. **Nanostructured thermoelectric materials**, Khalid Bin Masood, **Neha Jain**, Pushpendra Kumar, Mushtaq Ahmad Malik, Jai Singh Book entitled "Thermoelectricity and Advanced Thermoelectric Materials" Woodhead Publishing Series in Electronic and Optical Materials 2021 **DOI**: https://doi.org/10.1016/B978-0-12-819984-8.00005-9

3. **Photoluminescence Mechanism and Key Factors to Improve Intensity of Lanthanide Doped Tungstate/ Molybdate Phosphors with Their Applications**, **Neha Jain**, Rajan Kumar Singh, R.A. Singh, Sudipta Som, Chung-Hsin Lu, Jai Singh, Book entitled "Luminescent Materials in Display and Biomedical Applications" CRC Press, Taylor & Francis Group 2020 **ISBN:** 9780429025334

4. ***Development in the innovation of lead halide based perovskite quantum dots from rare earth doped garnet based phosphors for light-emitting diodes,***Rajan Kumar Singh, **Neha Jain**, SudiptaSom, Somrita Dutta, Jai Singh, Ranveer Kumar, T.M.Chen and H. C. Swart, Book entitled "Spectroscopy of Lanthanide Doped Oxide Materials", *Elsevier Publication* 2020 (Woodhead Publishing, Cambridge, UK) **ISBN:** 9780081029350

5. ***Lead-free hybrid perovskite light-harvesting material for QD-LED applicatio***n, Rajan Kumar Singh, **Neha Jain**, Sudipta Som, Somrita Dutta, Jai Singh and Ranveer Kumar, Perovskite Materials, Devices and Integration, ***Intech Open***, London, United Kingdom, 2019 **ISBN:** 978-1-78985-072-7.

LIST OF CONFERENCES

AWARDS IN POSTER PRESENTATION

1. Best Poster award on "Synthesis and photoluminescence properties of $ZnMoO_4:Eu^{3+}$" in National symposium on "Horizon of light molecules materials and daily life" at Dr. HarisinghGour University, Sagar (M.P.) held on Dec 18-19, 2015.

2. First poster award on "Effect of charge compensator (Li+) on optical and vibrational properties of Eu^{3+} activated $ZnMoO_4$"in Fourth international conference on "Challenges in environmental science and technology" at SVN University, Sagar (M.P.) held on Feb 27-28, 2016.

3. First poster award on "Down-conversion emission by Tb^{3+} doped La_2O_3 nano-phosphor" in National conference "Energy or sustainable development" at Dr. Harisingh Gour University, Sagar (M.P.) held on March 23-24, 2017.

4. First poster award on "Improved up-conversion emission through Yb3+ incorporation in Ho3+ activated CaTiO3 perovskite" in 6th international conference on "Pollution and its control through agriculture pharmacy science and technology" at SVN University, Sagar (M.P.) held on Feb. 27-28, 2018.

5. Best oral presentation award on "Optical thermometry of Ho3+ and Yb3+ doped CaTiO3 Perovskite" in the National Conference "Hydrogen Energy in India Perspective: Role of Nano Materials" at Department of Physics, BHU Varanasi held on 31st October to 2nd November, 2018.

PAPERS PRESENTED/ATTENDED/PARTICIPATED IN INTERNATIONAL CONFERENCES

1. Presented paper poster on "Variations in photoluminescence properties with phase transition in Eu^{3+} activated $ZnMoO_4$" in International Conference on Interface of Physical, Chemical and Biological Sciences(IPCBS-2017),held on January 11-13, 2017at Dr. H. S. Gour Central University, Sagar, M. P.

2. Presented poster on "Blue to green tunable emission from Tb^{3+} doped La_2O_3 nano-phosphors" in ICNIB 2017 held on Oct 11-13, 2017 at DAVV, Indore (M.P.).

3. Presented poster on "Study of Ce^{3+}, Dy^{3+} and Eu^{3+} Activated $SrSnO_3$ for White LEDs" in ICC 2017 held on Nov 24-25, 2017 at Govt. Engineering College, Bikaner.

4. Presented poster on "Investigation of Optical Properties of ZnMoO4:Eu@GO/ r-GO Nano-Composite" in International conference on Wallop of globalization in Engg-Medi-Sci-Agri-Pharm-Tech Research from Feb. 27-28, 2019 at SVN University, Sagar.

PAPERS PRESENTED/ATTENDED/PARTICIPATED IN NATIONAL CONFERENCES AND WORKSHOP

1. Attended workshop on "Energy materials: Synthesis to Applications" under UGC Networking Program on December 1-7, 2015, at Department of Physics, BHU, Varanasi.

2. Presented poster on "Quantum cutting in Tb^{3+} and Yb^{3+} co-doped La_2O_3 for Solar cells" in Silver jubilee conference on "Study of matter using intense radiation sources and under extreme condition" from Nov 3-6, 2016, at UGC DAE CSR, Indore.

3. Presented poster on "Up-conversion emission by Ho^{3+} activated $SrSnO_3$ via Yb^{3+} ion sensitization" in National conference on luminescence and applications (NCLA-2017) held on Jan 09-11, 2017, at CSIR- IICT, Hyderabad.

4. Attended workshop on Advance imaging and microscopy from Feb 25-26, 2019 at at Dr. H. S. Gour Central University, Sagar, M. P.

REFEREES

Ph.D. Supervisor: **Prof. R.A. Singh,**
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