CURRICULUM VITAE

Dr. Jai Singh
Ph.D. - 2010 (Institute of Sc., B.H.U.)
NET-JRF, SRF (2003), GATE-2003 & 2004 (93.08 %), JEST-2001 (94.90%)
Department of Pure & Applied Physics
Guru Ghasidas Vishwavidyalaya,
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Membership of Professional Bodies :

- Indian Physics Association , Mumbai - Life Membership
- Fellow of Solar Energy Society of India (SESI)- Life Membership
- International Association of Advanced Materials (IAAM)- Five years Membership No-77920191694.
- Advanced Materials word Congress - Five years 2017-2022.
- American Chemical Society(ACS) Member Number - 30356693

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Qualification :

Exam.	Board/University	Subjects
Ph.D.	Department of Physics, Institute of Science, Banaras Hindu University, Varanasi	Condensed Matter Physics/Nanoscience & Technology

Publication Information:

Total Publication in International Journals : 68
Book Chapters: 06
Conference Proceeding : 08
Conferences : 58
Indian Patent : 1 (Under Review)
Google Total Citations : 1350
H-index :25
I-10 : 43

List of 10 major Recent Publications:

1. Rapid and room temperature synthesis of MAPb1-xSnxBr3-2xClx perovskite quantum dots with enhanced lifetime in warm WLEDs: A step towards environmental friendly perovskite light , RK Singh, S Som, S Dutta, N Jain, J Singh, R Kumar, Chemical Engineering Journal, 123629 (2019) https://doi.org/10.1016/j.cej.2019.123629 (I.F.= 8.355)

2. Enhanced Temperature-Sensing Behavior of Ho3+–Yb3+-Codoped CaTiO3 and Its Hybrid Formation with Fe3O4 Nanoparticles for Hyperthermia , N Jain, RK Singh, BP Singh, A Srivastava, RA Singh, J Singh ACS Omega 4 (4), 7482-7491(2019) https://doi.org/10.1021/acsomega.9b00184 (I.F.= 2.54)

3. Synthesis and Rational design of europium and Lithium Doped sodium Zinc Molybdate with Red emission for optical Imaging , N Jain, R Paroha, RK Singh, SK Mishra, SK Chaurasiya, RA Singh, Jai Singh , Nature Scientific Reports 9 , 2472(2019) doi:10.1038/s41598-019-38787-1(I.F.= 4.155)

4. 2D layered transition metal dichalcogenides (MoS2): synthesis, applications and theoretical aspects AK Singh, P Kumar, DJ Late, A Kumar, S Patel, J Singh Applied Materials Today 13, 242-270 (2018) https://doi.org/10.1016/j.apmt.2018.09.003 (I.F.= 8.055)

5. Structural and magnetic study of undoped and cobalt doped TiO_2 nanoparticles A Chanda, K Rout, M Vasundhara, SR Joshi, J Singh RSC Advances 8 (20), 10939-10947(2018) DOI: 10.1039/C8RA00626A (I.F.= 3.049)

6. Investigations on optical properties of ZnO decorated graphene oxide (ZnO@GO) and reduced graphene oxide (ZnO@r-GO), Pushpendra Kumar, Sudipta Som, Mukesh K. Pandey,Subrata Das, Jai Singh , Journal of Alloys and Compounds 744, 64-74 https://doi.org/10.1016/j.jallcom.2018.02.057 (I.F.= 4.175)

7. pH Dependent Optical Switching and Fluorescence Modulation of Molybdenum Sulfide Quantum Dots H. Mishra, Sima Umrao, Jai Singh, Advanced Optical Material (2017) https://doi.org/10.1002/adom.201601021 (I.F.= 7.435)

8. Large-area, continuous and high electrical performances of bilayer to few layers MoS_2 fabricated by RF sputtering via post-deposition annealing S Hussain, J Singh, D Vikraman, AK Singh, MZ Iqbal, MF Khan, P Kumar , Scientific Reports 6, 30791(2016) doi: 10.1038/srep30791 (2016) (I.F.= 4.155)

9. Role of Metal Oxide Electron-Transport Layer Modification on the Stability of High Performing Perovskite Solar Cells Trilok Singh, Jai Singh, ChemSusChem, DOI: 10.1002/cssc.201601004(2016) (I.F.= 7.80)

10. Synthesis and characterization of large-area and continuous MoS2 atomic layers by RF Magnetron Sputtering Sajjad Hussain, Muhammad Arslan Shehzad , Jai Singh et al. Nanoscale 8, 4340-4346(2016) DOI:10.1039/C5NR09032F (I.F.= 6.75)

Books/ Book Chapters (6):

1. Metal Oxide Nanostructures and Their Applications Edited by Ahmad Umar and Yoon-Bong Hahn "Zinc Oxide Nanostructures Synthesized by Pulsed-Laser Ablation and Thermal Evaporation" Jai Singh et al , American Scientific Publishers, Los Angeles ,USA Volume 5 (2010) 1–47 ISBN 1-58883-001- 2.
2. Encyclopedia of Semiconductor Nanotechnology Edited by Ahmad Umar "Metal Oxide Nanostructures; Synthesis, Characterizations and Applications" S.C. Singh, D.P. Singh, Jai Singh et al American Scientific Publishers (2017)ISBN 1-58883-001-2.
3. Synthesis, characterization and application of multifunctional materials Edited by S.B.Rai "Structural and Microstructural characterization of Nanomaterials", Jai Singh (Feb 2012) NOVA Publication USA ISBN 978-1-61470- 618-2 .

4. Metal Oxide (ZnO, TiO2, CuO and Fe_3O_4) Nanostructures: Synthesis and Applications Jai Singh et al, Encyclopedia of Semiconductor American Scientific publishers (2017) ISBN 1-58883-001- 2
5. Lead-free hybrid perovskite light-harvesting material for QD-LED application, Jai Singh et al, Perovskite Materials, Devices and Integration, Intech Open, London, United Kingdom, ISBN: 978-1-78985-072-7 (2019)
6. Development in the innovation of lead halide based perovskite quantum dots from rare earth doped garnet based phosphors for light-emitting diodes, Jai Singh et al Spectroscopy of Lanthanide Doped Oxide Materials, Elsevier Publication (Woodhead Publishing, Cambridge, UK) **ISBN:** 9780081029350 (2020)

Research Experience and Teaching / Details of Employment (Past)

Organisation	Area(s)
Scientist -Dept of Physics, Banaras Hindu University, Varanasi, India	Hydrogen storage materials and oxide nano-materials
Visiting Scientist- Institute of Inorganic and Material Chemistry, Universität zu Köln, Greinstraße 6 , 50939 Köln, Germany	Transparent conducting oxide
Post Doctoral Fellow- School of Materials Science and Engineering, Pusan National University, Busan, South Korea	Transparent conducting oxide, oxide thin films and Graphene
Research Professor-Graphene Research Institute, Department of Physics & Department of Nano Engineering, Sejong University, Seoul-143-747, S. Korea	Graphene, MoS_2, WS_2, Oxide film
Assistant Professor - Dr. Harisingh Gour Central University, Sagar	Teaching and Research

Research + Teaching Experience: ~16 Years

Collaboration / Visited Country : Germany , Bulgaria and South Korea

Administrative Experience:

Organization	Nature of Responsibility	Designation
Dr. Harisingh Gour Central University, Sagar, M.P.	Technical and purchasing Responsibility of Sophisticated Instrument **(HR-TEM and SEM)**	Teacher in-charge
Dr. Harisingh Gour Central University, Sagar, M.P.	Final CBCS examination	Co-ordinator
Dr. Harisingh Gour Central University, Sagar, M.P.	Departmental in-charge and Special Invitee by IQAC (Internal Quality Assurance Cell) board	IQAC Member
Dr. Harisingh Gour Central University, Sagar, M.P.	PG and UG Counselling , Scrutinizer of Mark-Sheet	Member
Dr. Harisingh Gour Central University, Sagar, M.P.	Admission cell (admission related responsibility)	Member
Dr. Harisingh Gour Central University, Sagar, M.P.	Selection Board Member of Non-teaching	Member
Dr. Harisingh Gour Central University, Sagar, M.P.	Counselling member of Private College	Member
Dr. Harisingh Gour Central University, Sagar, M.P.	Sophisticated Instrument Centre	Co-coordinator

Awards and Recognitions

i. CSIR-NET-JRF - All India level competitive examination for research eligibility to conduct research in leading research laboratories in India. Qualified examination conducted by Council of Scientific and Industrial Research (CSIR-NET), Govt. of India.

ii. CSIR-SRF-All India level competitive examination for research eligibility to conduct research in leading research laboratories in India.

iii. GATE: Qualified Graduate Aptitude Test for Engineers Conducted by Ministry of Human Resource and Development (MHRD), Govt. of India with percentile score of 93.08 %.

iv. JEST: Qualified Joint Entrance Scholarship Test (JEST) conducted by IUACA-TIFR, India with percentile score of 94.90 %.

v. Merit Scholarship for Bachelors degree: Awarded State Government Scholarship for pursuing Bachelor of Science .

vi. Merit Scholarship for Schooling: Merit Scholarship for Matriculation: Awarded State Government Scholarship for pursuing Matriculation .

vii. Awarded State Government Scholarship for pursuing primary education.

viii. National Science Council (NSC) in Taiwan Post-Doc award (decline).

ix. Visiting Scientist fellowship by Institute of Inorganic and Material Chemistry, Universität zu Köln, Germany .

x. Pusan National University postdoctoral award for Post-doc .

xi. Outstanding graduate student 2008-2009 in Banaras Hindu University, DST unit on Nanoscience and Technology, Varanasi

xii. DST- International Travel Support under young scientist for MRS (US) Fall Meeting (decline) .

xiii. **Lead** Guest Editor: A Special Issue on Transparent Conducting Materials (TCM): and Applications "Reviews in Advanced Sciences and Engineering (RASE)" Journal

xiv. **Lead** Guest Editor: A Special Issue on "New Energy Materials for future Applications "Energy and Environment Focus" Journal.

xv. Lead Guest Editor: A Special Issue on "Engineered Nanomaterials: Synthesis, Characterization, and Application to Display Devices" Journal of Nanomaterials" .

xvi. International Editorial Board Members of Reviews in Advanced Sciences and Engineering

xvii. Member of International Organizing Committee of 2nd International Conference on "New Energy and Sustainable Development) Sanya, China. http://www.engii.org/workshop/nesd2013november/OrganizingCommittee.aspx

xviii. Invited Speakers The Collaborative Conference on Crystal Growth (3CG) http://www.emn3cg.org/invited-speakers/

xix. Editorial board member of International Journal of Sustainable and Green Energy, Science PG

xx. Editorial Board member of "International Journal of Materials Science And Technology".

xxi. **Editorial Board member** of International Journal of Ceramic Technology

xxii. **Editorial Board member** of International Journal of Alloys

xxiii. **Editorial Board member** of International journal of Bionics and Bio-Materials

xxiv. **Editorial Board member** of "Scientific Journal of Pure and Applied Sciences"

xxv. **Invited in Several International and National Conferences and Workshops** as Speaker in 2010-19.

xxvi. **Organized International and National conferences** at Sagar University as Organizing Secretary and Co-convenor in 2013-19.

Projects Completed /Submitted :

(i) Completed DST Fast Track Project : "Synthesis, Characterization and Application of Bulk Nanostructured Thermoelectric Materials as a foundation of Sustainable Energy" **sanctioned number :SR/FTP/PS-144/2012 (~20 lakhs INR)**

(ii) Completed Project under UGC Start up Grant for Newly Recruited Faculty Title of Project : Growth of Large-Area, Highly Crystalline Single -layer MoS_2Thin film on Insulating Substrates for Transparent Electronics **(6 lakhs INR)**

(iii) Sanctioned DST International Project -Under bilateral joint program for scientific collaboration Bulgaria-India for the project proposal "Ultrahigh efficient lead-free perovskite solar cells" **(~22 Lakh INR)**

Served as referee for following Journals:

- American Chemical Society
- The Royal Society of Chemistry
- Springer- Nature
- Material Research express (IOP)
- Wiley- Chemistry Select
- Journal of Nanoscience and Nanotechnology,
- Materials Science and Engineering B,
- Advanced Materials Letters,
- Material Letter,
- Applied Surface Science,
- Science of Advanced Materials,
- International Journal of Hydrogen Energy,
- RSC Advances,
- Science of Advanced Materials
- Reviews in Advanced Sciences and Engineering
- Energy and Environment Focus
- Journal of Physics and Chemistry of Solids etc.
- International Journal of Sustainable and Green Energy etc.

Detail of Patents.

Title : **Development of a New Technology for Bulk Formation of Methylammonium Iodide (CH_3NH_3I) Electrolyte Salt for the Formation of Light Harvesting Materials** under Review for Indian patent

Research Experience and Areas of Interests

Synthesis, Characterization, Properties and Application of different metal, metal oxide nanostructures, thin films and its nano-composites by employing various techniques"

Area of Interest:

- Synthesis ,Characterization of 2D MoS_2 , WS_2 and Graphene , Graphene oxide , for FET and bio-medical application
- Synthesis of transparent conductive oxide (Doped oxide e.g. ZnO, GeO_2, SnO_2) by CVD, Sol-gel, DC and RF sputtering
- Synthesis ,characterization of n- and p-type thermoelectric material (slicide, oxide and chalcogenide based) by chemical and physics methods
- Growth of different metal oxide (ABO_3 types , ZnO ,SnO_2, Cu_2O, TiO_2 and Multiferroic materials) thin film and aligned nanostructures by CVD, PECVD, Pulsed laser deposition
- Synthesis of metal oxide nanomaterials (zinc oxide, copper oxide, tin oxide etc.) by (a) Thermal evaporation and (b) Wet chemical methods.

- Synthesis of metallic (silver and gold) nanomaterials by reduction with herbs, chemical methods.
- Synthesis of metal oxide/ graphene and carbon nanotubes, nano-composites
- Photovoltaic, Hydrogen storage, Optical and field emission properties of metal oxide nanomaterials

Professional Expertise:

- ***Expertise in Synthesis Methods***
  - DC and RF sputtering for metal and metal oxide
  - Chemical Vapor Deposition system for Graphene and MoS2
  - Chemical Vapor Deposition system (Thermal evaporation) (House built setup)
  - Plasma Enhanced –CVD and PVD (Plasma Electronic, Neuenburg, GmbH Germany),
  - Pulsed Laser Deposition (PLD) by Excimer Laser Lextra 300
  - DC and RF sputtering for metal and metal oxide
  - Wet Chemical Method
  - Spinning Coating and Spray Pyrolysis Methods
  - High Energy Ball Milling
  - Hydrothermal Method
  - Solvothermal Method
- ***Characterization Techniques***
  - X-ray diffractometer (Philips 1710, Philips X'PERT PRO PAN Analytical)-operation, maintenance and data analysis
  - Scanning Electron Microscope-SEM (XL-20 Philips, ESEM Quanta 200 FEI)-operation, maintenance and data analysis
  - Transmission Electron Microscope-TEM (EM-CM 12 Philips)-Sample preparation, loading, operation, maintenance and data analysis using computer software
  - High Resolution Transmission Electron Microscope-HRTEM (TECHNI 200 G^2, FEI)-Sample preparation, loading, operation, maintenance and data analysis using computer software
  - Atomic Force Microscope-AFM-Sample preparation, loading, operation, maintenance and data analysis using computer software
- ***Properties & Application Measurement Tools***
  - Photoluminescence (PL) Instrument (PerkinElmer LS-45) - handling and data analysis
  - XPS-- handling and data analysis
  - Fourier Transform Infrared Spectra -handling and data analysis
  - UV/Vis Spectrophotometer, (PerkinElmer Lambda-750 S)-handling and data analysis
  - Raman spectrometer (Renishaw, Model No. H 45517)
  - Field Emission Property Measurement (house built setup)-Sample loading and data analysis
  - Hydrogen Absorption by P-C-I instrument- Sample loading and data analysis
  - Electrical (Hall effect), magnetic and optical characterization techniques at room and at different temperatures