

CURRICULUM VITAE

Jasvir Singh

Contact Details:

Department of Physics

Guru Nanak Dev University

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Objective: To explore and understand the physical and chemical properties of the materials at nano-scale and to develop novel materials for various applications. I am also interested in teaching Physics, especially quantum mechanics, classical mechanics, statistical mechanics and condensed matter physics.

Academic Profile:

| Degree/Course | Institution | Division/Class | Year of Passing | Marks | Subjects |
|--|---------------------------------------|----------------|-----------------|-------------------------------|--|
| Ph.D. (Physics) | Guru Nanak Dev University Amritsar | - | 2021 | 8.6 CGPA Course work | Physics |
| M.Sc. (Nano Science & Technology) | G.N.D. University, Amritsar | First | 2010 | 62.05% | * |
| B.Sc. | Punjab University, Chandigarh | First | 2007 | 60% | Physics, Math Chemistry, English, Punjabi |
| 10+2 | P.S.E.B. Mohali | Second | 2004 | 56.44% | Physics, Chemistry, Math, English, Punjabi. |
| 10 th | P.S.E.B. Mohali | First | 2002 | 73.69% | Science, Math, English, Hindi, Punjabi, Social Studies. |

* Subjects Studied in M.Sc. (Nanoscience and Technology)

Material Characterization Techniques, Synthesis of Nanomaterials, Carbon Nanotubes and Its Functionalization, Nano Sensors and Nano Devices, Nanosemiconductors, Spintronics and Plasmonics, Physical Chemistry, Solid State Physics-I & II, Quantum Mechanics, Mathematical Physics, Analog and Digital Electronics, Computational Methods and, MATLAB.

Professional Qualification:

| Professional Degree | Major Subjects | Year of Passing | Board/Univ. | % age/CGPA |
|-----------------------|----------------|-----------------|---------------------------|------------|
| Bachelor Of Education | Science Group | 2011 | Guru Nanak Dev University | 55.18% |

National Examinations Qualified

1. NET December 2013 (rank 103)

2. GATE 2014 (GATE Score 459)

Research Skills and Experience: More than 5 years of hands-on experience in the following synthesis, characterization and data analysis techniques:

(a) Synthesis Techniques:

1. Low and High Energy ball milling
2. Probe Sonication
3. Spin Coating Method
4. Sol-gel and co-precipitation Methods
5. Green Synthesis method

(b) Characterization Techniques:

1. Powder X-ray diffraction (XRD)
2. Fourier Transform Infrared spectroscopy
3. Raman Spectroscopy
4. UV-Vis-NIR Spectrophotometer
5. Photoluminescence spectroscopy
6. Field Effect Scanning Electron Microscope (FE-SEM)
7. LCR meter
8. Electrometer
9. Two probes, Four probes and Hall effect measurement
10. Photocatalytic degradation of organic dyes and antibiotics

(c) Data Analysis computer programs

1. Peak profile analysis of X-ray diffraction data using Scherrer's method, Williamson-Hall method (UDM, USDM, UDEDM and Modified W-H methods), size-strain method and Warren-Averbach method
2. La Bail fit and Rietveld Refinement for structural and microstructural parameters
3. ab initio crystal structure determination using ESPOIR program
4. Maximum Entropy method for structural, electron density distribution and defects density
5. TEM data analysis including SAED pattern indexing.
6. Origin software: Plotting of graphs, fitting of experimental data using theoretical models, Deconvolution of data and simulation.

(d) Theoretical calculations

First principle DFT (Density-functional theory) calculations using Quantum Espresso package for structural, density of states (DOS) and band structure calculations.

Publications:

1. "Effect of calcination temperature on structural, optical and antibacterial properties of ball mill synthesized Co_3O_4 nanomaterials" **Jasvir Singh**, Gurdev Preet Singh, Ravish Kumar Jain, Brhamjot Singh, K. J. Singh, Ravi Chand Singh, *J Mater Sci: Mater Electron* (2022) 33:3250–3266. (I.F. 2.779)
2. "Enhancement of optical, dielectric and transport properties of (Sm, V) co-doped ZnO system and structure-property correlations" **Jasvir Singh**, Ravi Chand Singh, *Ceramics International* 47 (2021) 10611-1062. (I.F. 5.532)
3. "Tuning of structural, optical, dielectric and transport properties of Fe-doped ZnO:V system" **Jasvir Singh**, Ravi Chand Singh, *Materials Science in Semiconductor Processing* 121 (2021) 105305. (I.F. 4.644)
4. "Structural, optical, dielectric and transport properties of ball mill synthesized ZnO– V_2O_5 nanocomposites" **Jasvir Singh**, Ravi Chand Singh, *Journal of Molecular Structure* 1215 (2020) 128261. (I.F. 3.841)
5. "Influence of different milling media on structural, morphological and optical properties of the ZnO nanoparticles synthesized thorough ball milling, **Jasvir Singh**, Shivani Sharma, Sumedha Soni, Sandeep Sharma, Ravi Chand Singh, *Materials Science in Semiconductor Processing* 98 (2019) 29–38. (I.F. 4.644)
6. "Effect of tungsten doping on structural and optical properties of rutile TiO_2 and band gap narrowing" **Jasvir Singh**, Shivani, Sharma, Sandeep, Sharma and Ravi Chand Singh, *Optik: International journal for Light and Electron Optics* 182 (2019) 538-547. (I.F. 2.84)
7. "Sputter Deposited Mn-doped ZnO Thin Film for Resistive Memory Applications" A.K. Chawla, Ravish Jain, **Jasvir Singh**, et. al., *ChemistrySelect* 7 (2022) e202203633 (I.F. 2.307)
8. "Investigation of structural, optical and antibacterial properties of pure and Ni-doped CuO nanostructures" Gurdev Preet Singh, K. J. Singh, **Jasvir Singh**, Ravish Kumar Jain, Brahmjot Singh, Ravi Chand Singh, *The European Physical Journal Plus* 137 (2022) 959. (I.F. 3.758)
9. "Temperature dependent photoluminescence from WS_2 nanostructures" Shivani Sharma Shubham Bhagat **Jasvir Singh**, Manzoor Ahmad Sandeep Sharma, *Journal of Materials Science: Materials in Electronics* 29 (2018) 20064–20070. (I.F. 2.779)
10. "Size-tunable photoluminescence from WS_2 nanostructures" Shivani Sharma, **Jasvir Singh**, Shubham Bhagat, Mandeep Singh and Sandeep Sharma, *Mater. Res.Express* 5 (2018) 045047. (I.F. 2.025)
11. "Excitation-dependent photoluminescence from WS_2 nanostructures synthesized via top-down Approach" Shivani Sharma, Shubham Bhagat, **Jasvir Singh**, Ravi Chand Singh and Sandeep Sharma, *J Mater Sci* 52, 11326–11336 (2017). (I.F. 4.682)

Conference Proceeding:

1. "Doping induced changes in structural and optical properties of $\alpha\text{-Fe}_2\text{O}_3$, **Jasvir Singh**, Shivani Sharma, Shubham Bhagat, Sandeep Sharma, and Ravi Chand Singh AIP Conference Proceeding, 1953, 030153 (2018).

2. "Effect of Fe₂O₃ doping on structural properties of ZnO-V₂O₅ based varistor system, **Jasvir Singh**, Virpal, Sandeep Sharma, Ravi Chand Singh, AIP Conference Proceedings 1832, 120021 (2017); doi: 10.1063/1.4980706
3. "Luminescence in 2-dimensional WS₂ nanosheets, Shivani Sharma, Shubham Bhagat, **Jasvir Singh**, Ravi Chand Singh and Sandeep Sharma, AIP Conference Proceedings, 1953, 030131, (2018).
4. "Dielectric and optical properties of Fe doped ZnS nanoparticles, Virpal, Anita Hastir, Nipin Kohili, Jasmeet Kaur, Amanpreet Kaur, **Jasvir Singh**, Sandeep Sharma, Ravi Chand Singh, International Journal of Scientific & Engineering Research 8 (2017) 16-19.
5. "Effect of Cr doping on structural and magnetic properties of ZnS nanoparticles, Virpal, **Jasvir Singh**, Sandeep Sharma, Ravi Chand Singh, AIP Conference Proceedings, 1731, 050077 (2016).
6. "Improved magnetic properties of ethylene glycol passivated Fe doped ZnS nanoparticles. Virpal, **Jasvir Singh**, Sandeep Sharma, Ravi Chand Singh, Materials Today: Proceedings 4 (2017) 9461-9465.
7. "Investigation of structural and optical properties of pure and zinc doped CuO nanoparticles, Gurdev preet Singh, **Jasvir Singh**, Ravi Chand Singh, K.J. Singh, AIP Conference Proceedings 2162, 020159 (2019); <https://doi.org/10.1063/1.5130369>.

Papers Presented at National and International Conferences and Workshops Attended:

1. "Investigating the correlation between structural and electrical properties of V₂O₅ doped ZnO based varistor system", **Jasvir Singh**, Vikas Anand, Shubham Bhagat, Shivani Sharma, Komalpreet Kaur, Kamaldeep Kaur, Virpal, Ravi Chand Singh and Sandeep Sharma. Second International Conference on Material Science (ICMS2017), Department of Physics, Tripura University during 16-18 February, 2017.
2. "Doping induced changes in structural and optical properties of α -Fe₂O₃", **Jasvir Singh**, Shivani Sharma, Sandeep Sharma, Ravi Chand Singh. ICC-2017 2nd international conference on condensed matter and applied physics, Department of Physics, Engineering College, Bikaner during Nov 24-25, 2017.
3. "Effect of Fe₂O₃ Doping on Structural Properties of ZnO-V₂O₅ Based Varistor System", **Jasvir Singh**, Virpal Sharma, Sandeep Sharma, R.C. Singh, 61st DAE Solid State Physics Symposium, KIIT University, Bhubaneswar, Odisha, December 26-30, 2016
4. "BRNS school on" Computational Methodologies across Length Scales" August 28 – September 09, 2017, BARC-Mumbai, India.
5. National Conference on "Methods and challenges to harvest water for sustainable development" 15 Feb- 2023, B.A.M. Khalsa College, Garhshankar, Punjab.

Leadership and Management Role:

- Guided M.Sc. students in their dissertations
- Demonstration of the instruments to the visiting students.
- Lab Management includes purchase and maintenance of the instruments, dealing with service engineers for installations and servicing.

References:

1. Dr. Ravi Chand Singh, Professor, Department of Physics, Guru Nanak Dev University, Amritsar-143001 (INDIA) Email: ravichand.singh@gmail.com
 2. Dr. Sandeep Sharma, Assistant Professor, Department of Physics, Guru Nanak Dev University, Amritsar-143001 (INDIA) Email: sandeepscl@gmail.com
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Current Status: Working as an assistant professor in the Physics department of B.A.M. Khalsa College Garhshankar, Punjab, India

Personal Details:

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|-------------------------|---|
| Permanent Address | Jasvir Singh Vill- Passi bet, P/O- Safdarpur Dasuya. Distt. Hoshiarpur. Pin: 144205 |
| Gender & Marital status | Male, Unmarried |
| Date of birth | 30 th July, 1985 |
| Nationality | Indian |
| Languages Known | English, Punjabi, Hindi |

Declaration:

I hereby declare that all the details furnished above are true to the best of my knowledge and conscience. If any document is needed to be furnished, I will be happy to provide it upon direction from the authority.

Yours' truly,

Jasvir Singh