Dr. Ashish Kumar

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Reference:

1. Dr. V. N. Singh
   Principal Scientist,
   CSIR-NATIONAL PHYSICAL
   LABORATORY, Dr. K. S. Krishnan
   Marg, New Delhi, 110012, India.
   Email- singhvn@nplindia.org
2. Dr. N. Vijayan
   Senior Principal Scientist,
   CSIR-NATIONAL PHYSICAL
   LABORATORY, Dr. K. S. Krishnan
   Marg, New Delhi, 110012, India.
   Email- nvijayan@nplindia.org;
3. Dr Ritu Srivastava
   Senior Principal Scientist,
   CSIR-NATIONAL PHYSICAL
   LABORATORY, Dr. K. S. Krishnan
   Marg, New Delhi, 110012, India.
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Ph.D. in Physics

CSIR-NATIONAL PHYSICAL LABORATORY New Delhi, India

Thesis Title- "*Development and characterization of Heusler based Thermoelectric materials for the enhanced figure of merit*"

Supervisor- Dr. V. N. Singh (CSIR-NPL)

Teaching Experience

S.No.	Designtion	Institute	Subject	Experience
1	Assistant professor (Adhoc)	Dayanand College, Hisar	Physics	24, Aug 2022- till date

EDUCATION-

Qualification	Name of the Board/University/ Institution	Subjects / Specialization	Division	Passing Year
10th	BOARD OF SCHOOL EDUCATION HARYANA	HINDI, ENGLISH, MATHEMATICS, SOCIAL SCIENCE, SCIENCE & TECHNOLOGY, MUSIC (MHV)	First	2010
12th	BOARD OF SCHOOL EDUCATION HARYANA	ENGLISH (CORE), COMPUTER SCIENCE, PHYSICS, CHEMISTRY, MATHEMATICS	First	2012
BSC PHYSICAL SCIENCE	UNIVERSITY OF DELHI	PHYSICS, CHEMISTRY, MATHS	First	2015
Master of Science	UNIVERSITY OF DELHI	Physics	First	2017
JRF	CSIR-UGC	Physics	AIR-13	2018
Ph.D.	CSIR-National Physical Laboratory, New Delhi	Physics	---	August, 2022

Research Interest-

- Condensed Matter Physics, Half and Full-Heusler Based Thermoelectric and Magnetic Materials.

Research Experience and Experimental Skills:

- ✓ Solid-state reaction method for preparation of Half Heusler TiNiSn, ZrCoSb, FeNbSb materials, Composites of Half and Full-Heusler thermoelectric materials.
- ✓ Quartz vacuum sealing for controlled environment synthesis.

- ✓ Microstructure analysis from SEM/FESEM, TEM data.
- ✓ Data analysis on Rigaku bench top X-ray diffraction.
- ✓ Arc Melting Furnaces unit (includes Tri-arc and single-arc melting unit)
- ✓ Seebeck Coefficient and Laser flash analysis for electronic & thermal transport properties
- ✓ Physical Property Measurement System (PPMS) for magnetization versus magnetic field (M-H) measurements and magnetization versus temperature (M-T) measurements.

SOFTWARE/COMPUTATIONAL SKILLS:

- ✓ Applications: Microsoft Office Suite, Internet Explorer, HTML
- ✓ Origin for data analysis
- ✓ VESTA software for crystal structure simulation.
- ✓ Programming Language: C, C++, Visual Basic
- ✓ Mendeley Software
- ✓ Rietveld refinements of X-ray diffraction data (XRD) by using Full-Prof for structural analysis.

PERSONAL SKILLS:

Knowledge of research methodologies, Data and information collection, Writing and presenting reports, Keen interest in exploring ideas, Time punctual, dedicated to achieve goals, Confidence & personal integrity are my most important aspects, Openness to change and Willingness to learn, communication, Confidence, Leadership, Organization, Team work, Working under pressure, Problem solving, Perseverance and Motivation.

PUBLICATIONS-

1. **Ashish Kumar**, KM Chaturvedi, Sahiba Bano, Bal Govind and D.K. Misra* Enhanced thermoelectric performance of p-type ZrCoSb0.9Sn0.1 via Tellurium

doping, ***Mater Chem Phys*** 258:123915, 10.1016/j.matchemphys.2020.123915 (2020).

2. **Ashish Kumar**; Sahiba Bano; Bal Govind; Aman Bhardwaj; V. N. Singh, "Enhanced thermoelectric performance of n-type Zr0.66Hf0.34Ni1+xSn Heusler nanocomposites", ***Journal of Alloys and Compounds***, 900, 163454, 10.1016/j.jallcom.2021.163454 (2022).
3. **Ashish Kumar**; K.M. Chaturvedi; Aman Bhardwaj; Bal Govind; Sahiba Bano and D.K. Misra, Implication of Nanostructuring of Bulk Nanocomposite Ti9Ni7Sn8 on the Optimization of High Thermoelectric Performance, ***Materials for Renewable and Sustainable Energy***, **9**, 10.1007/s40243-020-00172-8 (2020).
4. **Ashish Kumar**; Sahiba Bano; Bal Govind; Aman Bhardwaj; Komal Bhatt; D. K.Misra, "A Review on Fundamentals, Design and Optimization to High *ZT* of Thermoelectric Materials for Application to Thermoelectric Technology", ***Journal of Electronic materials*** 50, 6037-6059, 10.1007/s11664-021-09153-7 (2021).
5. **Ashish Kumar**; Bal Govind; Sahiba Bano; Manoj Kumar; Yogesh Singh; Sanju Rani; Brijesh Kumar; V. N. Singh, "Evolution of a weak magnetic moment in the FeNbSb based HH materials via Ni doping at Fe site", ***Journal of Magnetism and Magnetic Materials***, 169306, 10.1016/j.jmmm.2022.169306 (2022).
6. Sahiba Bano; **Ashish Kumar**; Dinesh Kumar Misra, "Errors Associated in Seebeck Coefficient Measurement for Thermoelectric Metrology", ***MAPAN***, ***36,*** 423–434 (2021).
7. Sahiba Bano; **Ashish Kumar**; Bal Govind; Abdul Hanan; Anuradha M. Ashoka; Dinesh Kumar Misra*, "Room Temperature Bi2Te3-Based Thermoelectric Materials with High Performance", ***Journal of Material Science: Materials in Electronics***, **31**, 8607-8617, 10.1007/s10854-020-03396-6 (2020).
8. Bal Govind, **Ashish Kumar**, Sahiba Bano, Aman Bhardwaj and Dinesh Kumar Misra, Structural and Magnetic Properties of Ni1+xMnSb Bulk Heusler Composite Materials, ***ACS Omega***, 5, 11895-11900 (2020).
9. Sahiba Bano; Bal Govind; **Ashish Kumar**; D.K. Misra*, "Ni-doped Bi0. 5Sb1. 5Te3 Single crystal: A Potential Functional Material for Thermoelectricity, Topological Insulator, and Optoelectronics", ***J Mater Sci Mater Electron***, **31**:15652–15658, 10.1007/s10854-020-04128-6 (2020).
10. Bal Govind[*], Purnima Bharti, **Ashish Kumar**, Sahiba Bano, Satyendra Singh, V.P.S. Awana, Effect of Sn substitution at Sb site on the magnetic properties of Mn_2NiSb full-Heusler alloy, ***Journal of Alloys and Compounds***, 907, 164515 (2022).
11. Bal Govind[*], Purnima Bharti, Sahiba Bano, **Ashish Kumar**, Satyendra Singh, V.P.S. Awana, Disorder Induced Magnetic Behavior of Non-Stoichiometric $Co_{0.75}Mn_{0.5}Fe_{0.75}Si$ Full-Heusler Alloy, ***Journal of Superconductivity and Novel Magnetism***, 35, 445-453 (2022).
12. Bal Govind, Purnima Bharti, Manisha Shrivastava, **Ashish Kumar**, Sahiba Bano, Komal Bhatt, J.S.Tawale, J.J.Pulikkotil, D.K.Misra[*], Magnetic Properties of Intermediate $Ni_{2-X}Mn_{1+X}Sb$ Full-Heusler Compounds, ***Materials Research Bulletin,*** 142, 111427 (2021).
13. Sahiba Bano, D.K. Misra, Purnima Bharti, **Ashish Kumar**, Bal Govind and Aman Bhardwaj*, "Enhanced Thermoelectric Performance at Elevated Temperature via Suppression of Intrinsic Excitation in p-type Bi0.5-xSnxSb1.5Te3 Thermoelectric Material" ***Journal of Material Science: Materials in Electronics***, 1007/s10854-022-07781-1 (2022).

14. Bal Govind, **Ashish Kumar**, Sahiba Bano, Aman Bhardwaj, V. P. S. Awana, "Substitution of excess Mn at Ni and Sn site in full-Heusler $Mn_{2.4}Ni_{0.8}Sn_{0.8}$ alloy" ***Applied Physics A***, *128:542 (2022).*
15. Sahiba Bano, **Ashish Kumar**, Bal Govind, Aman Bhardwaj, Aakansha Kapoor, Anuradha Ashok, Thiruvenkatam Vijayaraghavan, Pallavi Kushwaha,* and Surinder Pal Singh, "Enhanced Thermoelectric Performance of $Ni_xBi_{0.5}Sb_{1.5}Te_3$ via In Situ Formation of $NiTe_2$ Channels" ***ACS Appl. Energy Mater.***, 5, 11, 14127–14135 (2022).
16. Manoj Kumar, Sanju Rani, Yogesh Singh, Mamta, **Ashish Kumar**, V. N. Singh, "Strategy to improve the efficiency of tin selenide based solar cell: A path from 1.02 to 27.72%" *Solar Energy*,10.1016/j.solener.2021.12.069 (2022).
17. Sanju Rani, Manoj Kumar, Parveen Garg, Rahul Parmar, **Ashish Kumar**, Yogesh Singh, Vishal Baloria, Uday Deshpande, and Vidya Nand Singh*, "Temperature-Dependent n–p–n Switching and Highly Selective Room-Temperature n-$SnSe_2$/p-SnO/n-SnSe Heterojunction-Based NO_2 Gas Sensor" *ACS Appl. Mater. Interfaces*, 10.1021/acsami.1c24679 (2022).
18. Yogesh Singh, Manoj Kumar, Reena Yadav, **Ashish Kumar**, Sanju Rani, Shashi, Preetam Singh, Sudhir Husale, V.N.Singh, "Enhanced photoconductivity performance of microrod-based Sb_2Se_3 device" *Solar Energy Materials and Solar Cells, 243, 111765 (2022).*

CONFERENCE PUBLICATIONS-

1. **Ashish Kumar;** Neelam Sharma; Aman Bhardwaj; **Bal Govind**; Sahiba Bano and D.K. Misra*, Thermoelectric and mechanical Properties of ZrNi 1+x Sn Heusler Composite Alloy, *AIP Conference Proceedings*, **2220**, 40014 (2020).
2. **Ashish Kumar;** D.K. Misra; Sahiba Bano; Bal Govind; and Komal Bhatt, A review on sources of uncertainty in thermal conductivity measurement for thermal transport metrology, AdMet 2021, 5-6th March 2021.
3. Bal Govind; Aman Bhardwaj; Ankita Rajput; **Ashish Kumar;** Sahiba Bano and D.K. Misra, Effect of Ball Milling on Magnetic Properties of a Heusler Derivative Co9Ni7Sn8 Materials, *AIP Conference Proceedings*, **2220**, 110024 (2020).
4. Sahiba Bano; **Ashish Kumar;** Bal Govind; Debabrata Nayak; N. Vijayan and D.K. Misra, Investigation of micro-indentation hardness of Bi2Te3 based composite thermoelectric materials, *AIP Conference Proceedings*, **2220**, 120006 (2020).
5. Bal Govind; D.K. Misra; S.P. Khanna, **Ashish Kumar;** Sahiba Bano and Komal Bhatt, Errors in measurement of magnetic field and magnetic moment with associated uncertainty, AdMet 2021, 5-6th March 2021.
6. Komal Bhatt; Bal Govind; D.K. Misra**;** Sahiba Bano and **Ashish Kumar**, Brief discussion on GMR and TMR effect and importance of metrology for accurate measurements of its parameters, AdMet 2021, 5-6th March 2021.
7. Sahiba Bano; D.K. Misra*; **Ashish Kumar**; Bal Govind and Komal Bhatt, Error Analysis in Measurement of Electrical Conductivity, AdMet 2021, 5-6th March 2021.

WORKSHOP-

1. IEEE Authorship workshop titled **"**A Better Approach to Quality Publications**" held at CSIR-NPL on 13th Sept 2019.**

FELLOWSHIPS, AWARDS, AND ACHIEVEMENTS-

1. CSIR-Junior Research Fellowship and National Eligibility Test Physical Science Qualified in June-2018 (AIR-13).
2. GATE physics February-2018 (AIR-33).
3. Inspire Scholarship (2012-2017).
4. Inspire Fellowship (2018-2022)

LANGUAGE-

1. Hindi: Fluent

2. English: Proficient

DECLARATION:

I hereby declare that the information furnished above is true to the best of my knowledge.

Place: Agroha, Hisar, India (Ashish Kumar)