CURRICULUM VITAE

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Dr. Jagdish Kumar
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Languages

- English (Spoken and Written)
- Hindi (Spoken and Written)
- Punjabi (Spoken)

Educational Qualification

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Ph.D in Physics (2014)

Thesis title: *Experimental and ab-Initio Studies of Exotic Superconductors*
National Physical Laboratory New Delhi, India.
Himachal Pradesh University, Shimla, Himachal Pradesh, India.

M. Sc. Physics (2007)
Himachal Pradesh University, Shimla, Himachal Pradesh, India

B. Sc. Physics, Maths, Chemistry (2005)
Himachal Pradesh University, Shimla, Himachal Pradesh, India

Research/Work Experience (area of research)

- Since November 2012: **Assistant Professor**, Department of Physics and Astronomical Science under School of Physical and Material Sciences, Central University of Himachal Pradesh, Dharamshala, India.
- September 2010 to November 2012: **Senior Research Fellow** at National Physical Laboratory, New Delhi, India. (*Superconductivity and ab-initio (DFT) calculations*)
- September 2008 to September 2010: **Junior Research Fellow** at National Physical Laboratory, New Delhi, India. (*Superconductivity and ab-initio (DFT) calculations*)
- M.Sc. Project: Himachal Pradesh University Shimla, India (*Theoretical study of Crystal Field splitting in Praseodymium*)

Technical Acquaintance

- Experience in Synthesis of Materials
- Synthesis of high T_c superconductors (HTSC) by solid state reaction and sol gel method.

Experience in experimental characterization techniques

- X-ray diffraction and structural analysis using Fullprof program.
- Electrical measurement like four probe resistivity, Magnetoresistance (MR) using Closed Cycle Refrigerator (CCR).
- Measurement and analysis of thermal and magnetic properties.
- Characterization and analysis of Surface Studies like SEM and TEM.

Experience in computational physics

- Knowledge of computer programming using FORTRAN
- Calculation of microscopic properties of different materials using density functional theory (DFT) using codes SIESTA, ELK, WIEN2k, SPRKKR, BoltzTrap, Quantum Espresso.

Other relevant

- Teaching Condensed Matter Physics, Computational Physics, Introductory Quantum Mechanics and FORTRAN Programming to PG students.
- Knowledge of working with Windows and Linux platforms.
- Good knowledge of software like MS office, Origin, xmgrace.

Teacher's Courses

- *Two week faculty development program on Managing Online Classes and Co-Creating MOOCS from* **20th April 2020 to 06th May 2020** organized by Teaching Learning Centre, Ramanujan College, University of Delhi
- *Two weeks refresher course on Physics and Electronics* **06th January 2020 to 18th January 2020**, organised by HRDC Jammu, University of Jammu
- *72nd Refresher Course in Experimental Physics* from **16 June 2015 to 01 July 2015** organized by Department of Physics, Panjab University Chandigarh
- *Orientation Program (OP-116)* from **02.06.2014 to 28.06.2014**, organized by UGC Academic Staff College Shimla

Publications in International Journal

1. "*Electron-Phonon Mediated Superconductivity in 1*T − MoS_2 *and Effect of Pressure on Its Transition Temperature*" **Jagdish Kumar** and Harkirat Singh, Journal of Physics and Chemistry of Solids **(Accepted 24 May 2021)** doi: https://doi.org/10.1016/j.jpcs.2021.110185
2. "*Strain tunable Schottky barriers and tunneling characteristics of borophene/MX_2 van der Waals heterostructures*" Neha Katoch, Ashok Kumar, Raman Sharma, P. K. Ahluwalia, **Jagdish Kumar**, Physica E: Low-dimensional Systems and Nanostructures 120 (2020) 113842
3. "*Tuning of Structural Transition Pressure and Electronic Properties of Alkaline Earth Chalcogenides by Isoelectronic Substitution*" Abhinav Nag, Anuja Kumari, and **Jagdish Kumar**, Journal of Electronic Materials 49 (2020) 4773
4. "*Coercivity enhancement and magnetic property evaluation of Bi doped Mn_2Sb*" Kritika Anand, Nithya Christopher, **Jagdish Kumar,** Anurag Gupta, Nidhi Singh, J. of Magnetism & Magnetic Materials 476 (2019) 29

5. "*Alloyed monolayers of Cu, Ag, Au and Pt in hexagonal phase: A comprehensive first principles study*" Pooja Kapoor, Arun Kumarb, Munish Sharma, **Jagdish Kumar**, Ashok Kumar, P. K. Ahluwalia, Materials Science & Engineering B 228 (2018) 84
6. "*Possible Correlation between antiferromagnetic spin fluctuations and superconductivity in ThFeAsN*" **Jagdish Kumar**, Journal of Electronic Materials 46 (2017) 4701
7. *"Electronic, Mechanical and Dielectric Properties of Two Dimensional Atomic Layers of Noble Metals"* Pooja Kapoor, **Jagdish Kumar**, Arun Kumar, Ashok Kumar and P. K. Ahluwalia Journal of Electronic Materials 46 (2017) 650
8. "*Na_3Bi: A Robust Material Offering Dirac Electrons for Device Applications*" **Jagdish Kumar**, Pooja Kapoor and P. K. Ahluwalia, Journal of Electronic Materials 44 (2015) 3215
9. "*Enhanced superconducting performance of melt quenched $Bi_2Sr_2CaCu_2O_8$ (Bi-2212) superconductor*" **Jagdish Kumar**, Devina Sharma, P. K. Ahluwalia and V. P. S. Awana, Materials Chemistry and Physics, 139 (2013) 681688
10. "*Chalcogen height dependence of magnetism and Fermiology in $FeTe_xSe_{1-x}$*" **Jagdish Kumar**, S. Auluck, P. K. Ahluwalia and V. P. S. Awana, Supercond. Sci. Technol. 25 (2012) 095002
11. "*Superconductivity in the vicinity of ferromagnetism in oxygen free perovskite $MgCNi_3$: An experimental and density functional theory study*" Anuj Kumar, Rajveer Jha, Shiva Kumar Singh, **Jagdish Kumar**, P. K. Ahluwalia, R. P. Tandon, and V. P. S. Awana, Journal of Applied Physics, 111 (2012) 033907
12. *"Physical property and electronic structure characterization of bulk superconducting Bi_3Ni"* **Jagdish Kumar**, Anuj Kumar, Arpita Vajpayee, Bhasker Gahtori, Devina Sharma, P. K. Ahluwalia, S. Auluck and V. P. S. Awana, Supercond. Sci. Technol. 24 (2011) 085002
13. *"Comparative experimental and Density Functional Theory (DFT) study of the physical properties of MgB_2 and AlB_2"* Devina Sharma, **Jagdish Kumar**, Arpita Vajpayee, Ranjan Kumar, P. K. Ahluwalia, V. P. S. Awana, J. Supercond. and Nov. Magn. 24 (2011) 1925
14. "*Anomalous heat capacity and X-ray photoelectron spectroscopy of Superconducting $FeSe_{1/2}Te_{1/2}$*" V. P. S. Awana, Govind, Anand Pal, Bhasker Gahtori, S D Kaushik, A Vajpayee, **Jagdish Kumar** and H. Kishan J. Appl. Phys. 109 (2011) 07E122
15. *"Significant Improvement in Superconductivity by Substituting Pb at Bi-site in $Bi_{2-x}Pb_xSr_2CaCu_2O_8$ with x=0.0 to 0.40",* **Jagdish Kumar**, P. K. Ahluwalia, H. Kishan and V. P. S. Awana, J. Supercond. Nov. Magn. 23 (2010) 493

16. *"Anomalous thermoelectric power of overdoped $Bi_2Sr_2CaCu_2O_8$ superconductor*", V. P. S. Awana, **Jagdish Kumar**; G. S. Okram, Ajay Soni, P. K. Ahluwalia, H. Kishan, J. Appl. Phys. 106 (2009) 096102
17. *"Negative thermoelectric power of over-doped $Bi_2Sr_2CaCu_2O_8$ superconductor"* **Jagdish Kumar**, Monika Mudgel , G. S. Okram, Ajay Soni, V. P. S. Awana, P. K. Ahluwalia, R. B. Saxen and H. Kishan, Physica C 470 (2010) S203–S204

Books Chapters

- Photoelectron Spectroscopy: Fundamental Principles and Applications, **Jagdish Kumar**, Published in *Handbook of Materials Characterization*, ISBN: 978-3-319-92955-2, Springer International Publishing (2018) *https://doi.org/10.1007/978-3-319-92955-2_12*

Papers presented in conference/Symposia

1. "*Effect of doping on electronic properties of HgSe*", Abhinav Nag, O. S. K. S. Sastri, **Jagdish Kumar**, **AIP Conference Proceedings 1731, 090041 (2016)**
2. "*Electronic Properties of Graphene and Effect of Doping on the same*", Abhinav Nag, **Jagdish Kumar** and O. S. K. S. Sastri, **AIP Conference proceedings 1661 080021 (2015)**.
3. "*Effect of Mechanical Strain on Electronic Properties of Bulk MoS_2*", Sandeep Kumar, **Jagdish Kumar** and O. S. K. S. Sastri**, AIP Conference proceedings 1661 080011 (2015)**.
4. *"Effect of Strain along C-Axis of NbS_2***",** Tapender, **Jagdish Kumar** and O. S. K. S. Sastri, **AIP Conference proceedings 1661 110024 (2015)**.

5. "*Electronic band structure of $LaO_{1-x}F_xBiS_2$: A recently invented family of superconductors*" **Jagdish Kumar**, P. K. Ahluwalia, V. P. S. Awana, **AIP Conference proceedings 1512 1156 (2013)**

6. "*Ab-initio study of magnetism in FeSe and FeTe*" **Jagdish Kumar**, P. K. Ahluwalia, S. Auluck and V. P. S. Awana, **AIP Conference proceedings 1447 893 (2012)**

7. "*Density Functional Study of Perovskite Superconductor $MgCNi_3$*" **Jagdish Kumar**, Devina Sharma, Ranjan Kumar, V. P. S. Awana and P. K. Ahluwalia **AIP Conference proceedings 1393 199 (2011)**

8. "*Role of* inter *and intra-grain connectivity on physical properties of Bi-2212 and Bi-2223*" **Jagdish Kumar**, P. K. Ahluwalia, Anurag Gupta and V. P. S. Awana

International Conference On Quantum Effects in Solids of Today (I-ConQuEST-2010) National Physical Laboratory, New Delhi, India (Dec. 2010)

9. "*Difference in the microscopic properties of MgB_2 and AlB_2: A DFT study*" **Jagdish Kumar**, P. K. Ahluwalia, H. Kishan, V. P. S. Awana ans Sushil Auluck, International Conference On Quantum Effects in Solids of Today (I-ConQuEST) National Physical Laboratory, New Delhi, India (Dec. 2010)

10. "*Composition and temperature dependence of phase stability of Bi-2201*", **Jagdish Kumar**, V. P. S. Awana, P. K. Ahluwalia, International Conference on Advanced Functional Materials (ICAFM-2009) Trivandrum, Kerla, India (Dec. 2009)

Workshops/Seminars Attended

1. ***e-workshop on "Materials and their characterization"*** *Organised by* Department of Physics in School of Basic and Applied Sciences, Maharaja Agrasen University (14^{th} June to 19^{th} June 2021)
2. ***TEQIP-III Sponsored Five Day Short Term Course on Materials Characterization Techniques,*** organised by Department of Physics, NIT Srinagar, J&K (24-28 June 2019)
3. ***SPRKKR Hands on Course 2016,*** **Daresbury *Laboratory,* UK**
   (14^{th} to 17^{th} November 2016)
4. **Resource Person for National Workshop on *Transport phenomenon in low Dimensional Systems and First Principle Simulations of Condensed Matter System* organised DAV College *Jalandhar***
   (29^{th} to 30^{th} October 2016)
5. ***Computerisation Experiments in Physics Department* of Physics and Astronomical Science CUHP**
   (17^{th} to 19^{th} March 2016)
6. ***Recent Trends in Modren Materials,* Department of Physics and Astronomical Science CUHP**
   (11^{th} and 12^{th} August 2015)
7. ***Analytical Aspects of Dynamics Mathematical* Society and Department of Mathematics CUHP**
   (11^{th} and 17^{th} August 2014)
8. ***Experimental & Computational Techniques in Material Science* Department of Physics, Himachal Pradesh University Shimla**
   (31^{st} March to 2^{nd} April 2012)

9. ***Electronic Structure with ELK Code*, CECAM, Lausanne, Switzerland**
   (18^{th} to 23^{rd} July 2011)
10. ***Characterization Tools for Materials*, Panjab University, Chandigarh, India**
    (22^{nd} February 2011)
11. ***International Conference in Advances in Condensed and Nanomaterials* Panjab University, Chandigarh, India**
    (23^{rd} to 26^{th} February 2011)
12. ***International Conference on Quantum Effects in Solids of Today* National Physical Laboratory, New Delhi, India**
    (20^{th} to 23^{rd} December 2011)
13. ***Seminar cum workshop on First Principle and other Simulation Methods in Condensed Matter Physics*, Himachal Pradesh University, Shimla, India**
    (22^{nd} to 29^{th} March 2010)

Awards/Appreciations

1. **Best Poster** award in *International Conference in Advances in Condensed and Nanomaterials* Panjab University, Chandigarh, India
   (23^{rd} to 26^{th} February 2011)
2. **Best Poster** award **in** poster presentation session in *National Science Day Celebrations* in National Physical Laboratory New Delhi, India
   (**28^{th} February 2012**)