

# Curriculum Vitae

**Dr. Arun Kumar**

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**Personal Details:**

Nationality	: Indian
Date of birth	: 16th October 1987
Languages known	: English, Hindi
Gender	: Male
Marital status	: Married
Present position and affiliation	: Assistant Professor (Guest) Department of Physics, Lalit Narain Tirhut (L.N.T.) College (A constituent unit of B.R.A. Bihar University) Muzaffarpur-842001.

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## Educational Qualifications:

Class	Board/ University	Year of Passing	Percentage	Division
B.Sc. (Physics, Chemistry and Mathematics)	University of Allahabad	2007	68.8 %	First
M.Sc. (Physics)	University of Allahabad	2009	74.7 %	First
M. Tech (Material Science)	Indian Institute of Technology (BHU) Varanasi	2013	92.5 %	First

## Details of PhD Research:

<b>Name and address of PhD registered University:</b>	Indian Institute of Technology (BHU), Varanasi (U.P.), India
<b>Name and address of institute/lab of PhD work</b>	School of Materials Science and Technology, IIT (BHU), Varanasi
<b>Name and address of your PhD supervisor:</b>	Prof. Dhananjai Pandey, School of Materials Science and Technology, Indian Institute of Technology (BHU), Varanasi
<b>Title of PhD work:</b>	Magnetic Transitions in $\text{BiFeO}_3$ and $\text{Ca}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$ With and Without Substitutional Disorder
<b>Starting date of PhD (month &amp; year)</b>	23-July -2013
<b>Ending date of PhD (month &amp; year)</b>	31-July-2019 (Submission) and 24-February 2020 (Viva-voce)

## Details of Post-Doctoral Research:

<b>1</b>	<b>Name and address of institute</b>	School of Materials Science and Technology, Indian Institute of Technology (BHU), Varanasi (U.P.), India
	<b>Title of Research work:</b>	Synthesis and Characterization of Heusler Alloys
	<b>Tenure</b>	01-October-2020 to 25-February-2021 (5 Months)
<b>2</b>	<b>Name and address of institute</b>	Department of Physics, Indian Institute of Science Education and Research (IISER) Pune.
	<b>Title of Research work:</b>	Novel multifunctional (ferroelectric, magnetic, piezoelectric ) effects in solid solutions of perovskites

	<b>Tenure</b>	01-March -2021 to 28-Feb-2023 (2 Years)
<b>3</b>	<b>Name and address of institute</b>	I-Hub Quantum Technology Foundation, Indian Institute of Science Education and Research (IISER) Pune.
	<b>Title of Research work:</b>	Spin-Orbit Coupled Quantum Materials
	<b>Tenure</b>	From 28-August-2023 –16-January-2024

### **Awards and Scholastic Achievements:**

1. **Best Oral Presentation Award** in the International Conference on Electronic Materials and Applications (ICEMA)-2022.
2. **National Post-Doctoral Fellowship Award** by Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Government of India-2020.
3. **Best Poster Presentation Award** in the International Conference on Magnetic Materials and Applications (ICMAGMA)-2018.
4. **Best Poster Presentation Award** in the International Conference on Advances in Biological Systems and Materials Science in NanoWorld (ABSMSW)-2017.
5. **Gold Medal** for standing first in M. Tech. (Materials Science & Technology)-2013.
6. Qualified CSIR-UGC-National Eligibility Test (**NET**) with All India Rank-**127** in 2012.
7. Qualified Graduate Aptitude Test in Engineering (**GATE**) with All India Rank-**189** in 2012.

### **Membership:**

1. Life member (LMB3477) of the Material Research Society of India (MRSI)
2. Life member (LM 802) of the Magnetic Society of India (MSI).
3. Life member (LM 811) of Indian Crystallographic Association (ICA)
4. Member (99154816) of IEEE and IEEE Magnetic Society

### **International Visits:**

1. DESY Photon Science, Hamburg, Germany for [research experiment on high-resolution synchrotron x-ray powder diffractometer](#) from 01/11/2023 – 08/11/2023.
2. Paul Scherrer Institute, Switzerland for [research experiment on high-resolution synchrotron x-ray powder diffractometer](#) from 06/02/2022 – 16/02/2022.
3. DESY Photon Science, Hamburg, Germany for [research experiment on high-resolution synchrotron x-ray powder diffractometer](#) from 20/11/2018 – 27/11/2018.

4. San Francisco, California, United States of America for [attending the International Conference on Magnetism \(ICM-2018\)](#) from 13/07/2018 – 21/07/2018.
5. DESY Photon Science, Hamburg, Germany for [research experiment on high-resolution synchrotron x-ray powder diffractometer](#) from 29/05/2018 – 05/06/2018.
6. DESY Photon Science, Hamburg, Germany for [research experiment on high-resolution synchrotron x-ray powder diffractometer](#) from 07/05/2017 – 17/05/2017.

**Research Interest:** Structure-Property Correlation, Magnetic Materials, Multiferroics, Spin Glasses, Structural Phase Transitions, X-ray/Neutron Diffraction, Strongly Correlated Systems. Thermoelectrics and Electrocalorics.

### List of publications:

1. **Arun Kumar**, S. D. Kaushik, V. Siruguri and Dhananjai Pandey “Evidence for two spin-glass transitions with magnetoelastic and magnetoelectric couplings in the multiferroic  $(\text{Bi}_{1-x}\text{Ba}_x)(\text{Fe}_{1-x}\text{Ti}_x)\text{O}_3$  system” [Physical Review B](#) **97**, 104402 (2018) DOI: [10.1103/PhysRevB.97.104402](#).
2. **Arun Kumar** and Dhananjai Pandey, “Magnetoelectric spin-glass transition(s) in pure and disordered  $\text{BiFeO}_3$ ” [AIP Advances](#) **8**, 101409 (2018) DOI: [10.1063/1.5042131](#).
3. Anar Singh, **Arun Kumar** and Dhananjai Pandey “Effect of synthesis route on structure and dielectric properties of  $(1-x)\text{BiFeO}_3-x\text{BaTiO}_3$  solid solutions and its phase diagram” [Journal of Applied Physics](#) **124**, 224101 (2018) DOI: [10.1063/1.5043164](#).
4. **Arun Kumar**, A. Senyshyn and Dhananjai Pandey “Evidence for cluster spin-glass phase with precursor short-range antiferromagnetic correlations in the B-site disordered  $\text{Ca}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$  perovskite” [Physical Review B](#) **99**, 214425 (2019) DOI: [10.1103/PhysRevB.99.214425](#).
5. P. A. Kumar, **Arun Kumar**, Keshav Kumar, G. Anandha Babu, P. Vijayakumar, S. Ganesamoorthy, P. Ramasamy and Dhananjai Pandey “Evidence for Spin-Glass Transition in Hexagonal- $\text{DyMnO}_3$  without Substitutional Disorder” [Journal of Physical Chemistry C](#) **123**, 30499 (2019) DOI: [10.1021/acs.jpcc.9b07892](#).
6. **Arun Kumar**, Preetam Singh, Ram Janay Choudhary and Dhananjai Pandey “Effect of Mn-doping on the low temperature magnetic phase transitions of  $\text{BiFeO}_3$ ” [Journal of Alloys and Compounds](#), **825**, 154148 (2020) DOI: [10.1016/j.jallcom.2020.154148](#).
7. **Arun Kumar** and Dhananjai Pandey “Study of magnetic relaxation, memory and rejuvenation effects in the cluster spin-glass phase of B-site disordered  $\text{Ca}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$  perovskite: Experimental evidence for hierarchical model” [Journal of Magnetism and Magnetic Materials](#), **511**, 166964 (2020) DOI: [10.1016/j.jmmm.2020.166964](#).

8. **Arun Kumar**, A. Chaudhary, K. Gautam and Dhananjai Pandey “On the magnetic ground state of lead-free complex perovskite  $\text{Sr}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$ ” *Journal of Alloys and Compounds*, **859**, 157779 (2021) DOI: [10.1016/j.jallcom.2020.157779](https://doi.org/10.1016/j.jallcom.2020.157779).
9. P. A. Kumar, **Arun Kumar**, Keshav Kumar, G. Anandha Babu, P. Vijayakumar, S. Ganesamoorthy, P. Ramasamy and Dhananjai Pandey “Growth and characterization of  $\text{Dy}_{1-x}\text{Y}_x\text{MnO}_3$  single crystals by optical floating zone technique: A combined X-ray diffraction and DC magnetization study” *Journal of Crystal Growth*, **565**, 126152 (2021) DOI: [10.1016/j.jcrysgro.2021.126152](https://doi.org/10.1016/j.jcrysgro.2021.126152).
10. **Arun Kumar**, A. Chaudhary, K. Gautam and Dhananjai Pandey “Magnetic ground state and crystal structure of the giant dielectric constant material  $\text{Ba}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$ ” *Journal of Magnetism and Magnetic Materials*, **537**, 168236 (2021) DOI: [10.1016/j.jmmm.2021.168236](https://doi.org/10.1016/j.jmmm.2021.168236).
11. A. K. Khorwal, Nancy, S. Dash, **Arun Kumar**, A.V. Lukoyanov, E.I. Shreder, Y. Bitla, M. Vasundhara, A. K. Patra “Evidence for canonical spin glass behaviour in polycrystalline  $\text{Mn}_{1.5}\text{Fe}_{1.5}\text{Al}$  Heusler alloy” *Journal of Magnetism and Magnetic Materials*, **546**, 168752 (2021) DOI: [10.1016/j.jmmm.2021.168752](https://doi.org/10.1016/j.jmmm.2021.168752).
12. **Arun Kumar**, G. Sahu, and Sunil Nair “Evidence for cluster glass ground state of the giant dielectric constant material  $\text{Ba}(\text{Fe}_{1/2}\text{Sn}_{1/2})\text{O}_{3-\delta}$ ” *Journal of Alloys and Compounds*, **920**, 165914 (2022) DOI: [10.1016/j.jallcom.2022.165914](https://doi.org/10.1016/j.jallcom.2022.165914).
13. **Arun Kumar** and G. Sahu “The magnetic ground state of  $\text{Ba}(\text{Fe}_{1/2}\text{Sn}_{1/2})\text{O}_{3-\delta}$ : A potential giant dielectric material for technological applications” *Journal of Alloys and Compounds*, **961**, 171003 (2023) DOI: [10.1016/j.jallcom.2023.171003](https://doi.org/10.1016/j.jallcom.2023.171003).
14. Arun Kumar, P. Aravindh Kumar, G. Anandhababu, P. Vijayakumar, A.T. Sathyanarayana, and S. Ganesamoorthy “Growth and characterization of  $\text{Dy}_{(1-x)}\text{Sm}_{(x)}\text{MnO}_3$  single crystals by optical floating zone technique” *Journal of Crystal Growth* **628**, 127544 (2023) DOI: [10.1016/j.jcrysgro.2023.127544](https://doi.org/10.1016/j.jcrysgro.2023.127544).
15. **Arun Kumar**, P. Manuel, and Sunil Nair “Successive magnetic phase transitions with magnetoelastic and magnetodielectric coupling in the ordered triple perovskite  $\text{Sr}_3\text{CaRu}_2\text{O}_9$ ” *Physical Review Materials* **8**, 024405 (2024) DOI: [10.1103/PhysRevMaterials.8.024405](https://doi.org/10.1103/PhysRevMaterials.8.024405).
16. Namrata Pattanayak, **Arun Kumar**, A. K. Nigam, V. Pomjakushin, Sunil Nair and Ashna Bajpai “Quasi-static remanence as a generic-feature of spin-canting in Dzyaloshinskii-Moriya interaction driven canted-antiferromagnets” *Under review in Physical Review B* (2023) [<https://doi.org/10.48550/arXiv.2310.19009>].
17. **Arun Kumar**, S. N. Panja. L. Keller and Sunil Nair “Freezing of short-range ordered antiferromagnetic clusters in the  $\text{CrFeTi}_2\text{O}_7$ ” *Under review in Journal of Physics: Condensed Matter* (2024) [<https://doi.org/10.48550/arXiv.2401.08029>].

## List of participated Schools/ Workshop/ Conference:

1. Presented a poster presentation entitled “Magnetic ground state of  $\text{Sr}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$ : A potential giant dielectric material for technological applications” IUMRS-ICA 2022 from **19-23 December, 2022** organized by Indian Institute of Technology, Jodhpur, Rajasthan **India**.
2. Presented a oral presentation entitled “Magnetic ground state of  $\text{Ba}(\text{Fe}_{1/2}\text{Sn}_{1/2})\text{O}_{3-\delta}$ : A potential giant dielectric material for technological applications” International Conference on Electronic Materials and applications (ICEMA) 2022 from **16-17 September, 2022** organized by A. N. College Patna, Bihar, **India**. [**Best Oral Award**].
3. Presented a poster entitled “Magneto-structural phase transition in the *B*-site disordered  $\text{Sr}(\text{Fe}_{1/2}\text{Nb}_{1/2})\text{O}_3$  perovskite: A combined dc magnetization and X-ray diffraction study” 2022 Joint MMM-INTERMAG from **10-14 January, 2022** organized by AIP Publishing and IEEE Magnetics, **New Orleans, LA, USA**.
4. Participated in the online workshop on “Advanced Material Chemistry” from **June 14 to August 25, 2021**, organized by Homi-Bhabha National Institute (HBNI) Mumbai, **India**.
5. Participated online workshop on “Rietveld Refinement Method” from **22-24 September 2020**, organized by UGC-DAE Consortium for Scientific Research, Mumbai Centre in association with Indore Centre, **India**.
6. Participated in One-Week National Workshop on “Advanced Physical Tools and Techniques for Materials Characterization” from **July 28 to August 03, 2020**, organized by Department of Physics, Mahatma Gandhi Central University, Motihari-845401, Bihar, **India**.
7. Presented a poster entitled “Unambiguous evidence for the spin-glass transition in B-site disordered  $\text{A}(\text{B}'_{1/2}\text{B}''_{1/2})\text{O}_3$  perovskites” 26<sup>th</sup> International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM-2019) from **July 08-12, 2019**, Hotel Rain Tree, Anna Salai, Chennai, **India**.
8. Presented a poster entitled “Magnetoelastic and Magnetoelectric Couplings across the Spin-Glass Transition in the Multiferroic  $(\text{Bi}_{1-x}\text{Ba}_x)(\text{Fe}_{1-x}\text{Ti}_x)\text{O}_3$  System” International Conference on Magnetic Materials and Applications (ICMAGMA-2018) from **9-13 December 2018** organized by NISER, Bhubaneswar, **India**. [**Best Poster Award**].
9. Presented a paper entitled “Magnetoelectric spin-glass transition(s) in pure and disordered  $\text{BiFeO}_3$ ” 21<sup>th</sup> International Conference on Magnetism (ICM-2018) from **15-20 July, 2018** organized by AIP Publishing and IEEE Magnetics, **San Francisco, USA**.
10. Presented a paper entitled “Evidence for two spin-glass transitions with magnetoelastic and magnetoelectric couplings in the multiferroic  $(\text{Bi}_{1-x}\text{Ba}_x)(\text{Fe}_{1-x}\text{Ti}_x)\text{O}_3$  system” 6<sup>th</sup>

International symposium on Integrated Functionalities (ISIF-2017) from **10-13 December 2017** organized by New Delhi, **India**.

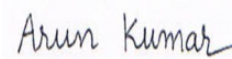
11. Presented a poster entitled “Evidence for spin-glass transitions in multiferroic (1-x)BiFeO<sub>3</sub>-xBaTiO<sub>3</sub> solid solutions” 24th Congress and General Assembly of the International Union of Crystallography from **21-28 August 2017** organized by International Convention Centre, Hyderabad, **India**.
12. Presented a poster entitled “Synthesis and Characterization of Mn-doped bismuth based multiferroic (1-x)BiFeO<sub>3</sub>-xBaTiO<sub>3</sub> solid solutions”, International Conference on Advances in Biological Systems and Materials Science in Nano World from **19-23 February 2017** organized by Department of Physics, Indian Institute of Technology (Banaras Hindu University), Varanasi, **India**. **[Best Poster Award]**.
13. Presented a poster entitled “Effect of Mn-doping on the multiferroic properties of (1-x)BiFeO<sub>3</sub>-xBaTiO<sub>3</sub> solid solutions”, 45th National Seminar on Crystallography (NSC 45) from **9 -12 July 2017**, organized by School of Materials Science and Technology, Indian Institute of Technology (Banaras Hindu University), Varanasi, **India**.
14. Presented a poster entitled “Microstructural and compositional analysis of multiferroic (1-x)BiFeO<sub>3</sub>-xBaTiO<sub>3</sub> solid solutions”, International Conference on Electron Microscopy, jointly organized by Department of Metallurgical Engineering and Electron Microscope Society of India (EMSI) from **2-4 June 2016** in Varanasi, **India**.
15. Participated in the International Workshop on “Symmetry relationship between crystal structures with applications to structural and magnetic phase transitions” from **27-31 October 2014**, organized by School of Materials Science and Technology, Indian Institute of Technology (Banaras Hindu University), Varanasi, **India**.

**Declaration: -**

I certify that the foregoing information is correct and complete to the best of my knowledge and belief and nothing has been concealed /distorted.

**Place: Pune**

**Date: 10/07/2024**



**Signature of the candidate**