Dr. Prashant Shahi

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| Phone: +91-9453305264prashantitbhu.shahi@gmail.com | **Address:** Department of Physics, D.D.U. Gorakhpur UniversityGorakhpur, U.P., India -273009 |

**Research Areas**: High-Pressure methods, Energy materials, Superconductivity, Topological Insulators, Magnetic Materials, Strongly Correlated System

# Education

**PhD** I.I.T. (BHU), Varanasi, Physics **May 2015**

Thesis Title: “Physical properties of Spinal Vanadates and Related materials”

 Supervisor: Prof. Sandip Chatterjee

**MSc** D.D.U. Gorakhpur University, Physics **May 2008**

 Specialization: “Bio-Physics”

 Advisor: Prof. Sugriva Nath Tiwari

**BSc** D.D.U. Gorakhpur University, Physics **May 2006**

 Majored in Physics, Mathematics

 Minored in Chemistry

# Honors and Awards

SERB-SIRE International Award 2022

**Institute Postdoctoral Fellowship** **2018**

**CAS PIFI Award 2016**

**CSIR- JRF/SRF** 2009

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# Research Experience

**PhD** , Indian Institute of Technology(BHU), Varanasi **2015**

Advisor: Prof. Sandip Chatterjee

**Institute of Physics, Chinese Academy of Sciences**, China **2016 to 2018**

**Postdoctoral Fellow**, Host- Prof. Jinguang Cheng

**Institute of Solid-State Physics**, University of Tokyo. Japan **Feb 2018 to July 2018**

**Postdoctoral Fellow,** Host- Prof. Yoshiya Uwatako

**DDU Gorakhpur University,** Gorakhpur **July 2018 to present**

**Assistant Professor**

# Teaching Experience

**DDU Gorakhpur University, Gorakhpur**, Aug 2018 to present

**Assistant Professor**, Physics

**Baba Bhim Rao Ambedkar University, Lucknow** Aug 2015 to Dec 2016

**Guest Lecturer**, Physics

# List of ongoing projects

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| **S. No.** | **Title of the project** | **Grant sanctioned in Rs.** | **Funding agency** |
| **1.** | High-pressure regulation and performance optimization of thermoelectric materials based on IV-VI binary composition. | 31,65,000/- | DST-SERB(2019-2022) |
| **2.** | High-pressure regulation and performance optimisattion of thermoelectric materials based on one-dimensional telluride Nb4SiTe4, Ta4SiTe4 and their solid solution for low-temperature application | 10,00,000/- | UGC(2020-2023) |
| **3.**  | Tuning Thermoelectric Properties of Topological Crystalline Insulator via Pressure Engineering. |   1,35,000/- | UGC DAE-CSR (2022-2025) |
| **4.** | **To unveil the regulation effects of pressure on the thermoelectric performance of the (Sn,Pb)(Se,Te) based topological materials.** |  15,00,000/- |  DST-SERB(2022 – 2023) |

# No of Publications in Peer reviewed Journals (Total-36)

## Journal Publications in Year 2021-2024

1. [**Conductivity and electrochemical behaviour of CoFe2O4 dispersed potato starch-based solid biopolymer electrolyte for energy application**](https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=m6rRbroAAAAJ&sortby=pubdate&citation_for_view=m6rRbroAAAAJ:ZHo1McVdvXMC)

Km Jyoti Rai, Deepash Shekhar Saini, **Prashant Shahi**, Marium Khan, Aalia Farid, Manindra Kumar

Ionics 30 (2), 819-831(2022)

1. [**Roles of surface and bulk states in giant magnetoresistance and anomalous hall effect in antiferromagnetically ordered Bi 1.9 Dy 0.1 Te 3 topological insulators**](https://pubs.rsc.org/en/content/articlehtml/2022/tc/d2tc03255d), Vinod K Gangwar, Shiv Kumar, Mahima Singh, Debarati Pal, Labanya Ghosh, Prajyoti Singh, Zhang Yufeng, Chaoyu Chen, Eike F Schwier, Kenya Shimada, **Prashant Shahi**, Yoshiya Uwatoko, Swapnil Patil, Anup K Ghosh, Sandip Chatterjee

Journal of Materials Chemistry C 10 (45), 17281-17290 (2022)

1. **Correlation between changeover from weak antilocalization (WAL) to weak localization (WL) and positive to negative magnetoresistance in S-doped Bi1.5Sb0.5Te1.3Se1.7** Mahima Singh, Labanya Ghosh, Vinod K Gangwar, Yogendra Kumar, Debarati Pal, **P Shahi**, Shiv Kumar, Sudip Mukherjee, K Shimada, Sandip Chatterjee,

Applied Physics Letters, 121, 3, 032403 (2022).

1. Anharmonic phonon interactions and Kondo effect in FeSe/Sb 2 Te 3/FeSe hetero-structure: Proximity effect between ferromagnetic chalcogenide anddi-chalcogenide.Labanya Ghosh, Mohd Alam, Mahima Singh, Srishti Dixit, Satya Vijay Kumar, Abhineet Verma, **Prashant Shahi**, **Yoshiya Uwatoko**, Satyen Saha, Archana Tiwari, Ajay Tripathi, Sandip Chatterjee
2. [Observation of antiferromagnetic ordering from µ-SR study and Kondo effect in Dy doped Bi2Se3 topological insulator](https://iopscience.iop.org/article/10.1088/1361-6463/ac128f/meta). Vinod Kumar Gangwar, Shiv Kumar, Mahima Singh, Prajyoti Singh, Labanya Ghosh, Debarati Pal, **Prashant Shahi,** **Yoshiya Uwatoko**, Eike F Schwier, K Shimada, Durgesh Kumar Sharma, Sudhir Kumar, **Sandip Chatterjee.**

J. Phys. D: Appl. Phys. **54** 455302 (2021)

1. [Defect induced ferromagnetic ordering and room temperature negative magnetoresistance in MoTeP](https://www.nature.com/articles/s41598-021-88669-8). Debarati Pal, Shiv Kumar, **Prashant Shahi**, Sambhab Dan, Abhineet Verma, Vinod K Gangwar, Mahima Singh, Sujoy Chakravarty, **Yoshiya Uwatoko**, Satyen Saha, Swapnil Patil, **Sandip Chatterjee**. *Scientific reports 11 (1), 1-9 (2021).*
2. [Evidence of surface and bulk magnetic ordering in Fe and Mn doped Bi2(SeS)3 topological insulator](https://aip.scitation.org/doi/abs/10.1063/5.0035433). Mahima Singh, Shiv Kumar, Mohd Alam, Vinod K Gangwar, Labanya Ghosh, Debarati Pal, Rahul Singh, **P Shahi**, P Chaudhary, Kenya Shimada, **Sandip Chatterjee**. *Applied Physics Letters 118 (13), 132409 (2021)*
3. [Pressure induced superconducting state in ideal topological insulator BiSbTe3](https://iopscience.iop.org/article/10.1088/1402-4896/abe5d4/meta). Vinod K Gangwar, Shiv Kumar, Mahima Singh, Labanya Ghosh, Yufeng Zhang, **Prashant Shahi**, Matthias Muntwiler, Swapnil Patil, Kenya Shimada, **Yoshiya Uwatoko**, Jyotirmoy Sau, Manoranjan Kumar, **Sandip Chatterjee**. *Physica Scripta 96 (5), 055802 (2021).*
4. Anomalous and topological Hall effect in Cu doped Sb2Te3 topological insulator. Abhishek Singh, Vinod K Gangwar, **Prashant Shahi**, Debarati Pal, Rahul Singh, Shiv Kumar, S Singh, SK Gupta, Sudhir Kumar, Jinguang Cheng, **Sandip Chatterjee**. *Applied Physics Letters 117 (9), 092403 (2020).*
5. High pressure investigation of an organic three-dimensional Dirac semimetal candidate having a diamond lattice. Andhika Kiswandhi, Mitsuhiko Maesato, Shinya Tomeno, Yukihiro Yoshida, Yasuhiro Shimizu, **Prashant Shahi**, Jun Gouchi, **Yoshiya Uwatoko**, Gunzi Saito, Hiroshi Kitagawa. *Physical Review B 101 (24), 245124 (2020).*
6. Investigations on structural and optical properties of Al-modified ZnO nanoparticles. Shiv Kumar, Manish Kumar, Arvind Kumar, Subhash Sharma, **Prashant Shahi**, **Sandip Chatterjee**, Anup Kumar Ghosh. Journal of Materials Science: Materials in Electronics 31 (10), 7715-7723 (2020).
7. Pressure-induced enhancement of thermoelectric power factor in pristine and hole-doped SnSe crystals. Na Su, BC Qin, KJ Zhu, ZY Liu, **P Shahi,** JP Sun, BS Wang, Y Sui, YG Shi, LD Zhao, J-G Cheng. RSC advances 9 (46), 26831-26837 (2019).
8. Effect of high pressure on intercalated FeSe high-Tc superconductors. Sun Jian-Ping, **Prashant Shahi**, Zhou Hua-Xue, Ni Shun-Li, Wang Shao-Hua, Lei He-Chang, Wang Bo-Sen, Dong Xiao-Li, Zhao Zhong-Xian, Cheng Jin-Guang. ACTA PHYSICA SINICA 67 (20) (2019).
9. Bipolar Conduction is the Origin of the Electronic Transition in Pentatellurides: Metallic vs. Semiconducting Behavior, **P. Shahi**, D.J .Singh, J.P.Sun, L. X .Zhao, G. F. Chen, Y.Y. Lv, J. Li, J-Q. Yan, D.G. Mandrus, J-G. Cheng, Phys. Rev. X, ISSN: 2160-3308, (2018), 8, 021055,DOI:https://doi.org/10.1103/PhysRevX.8.021055. (Impact factor: 14.385)
10. High-Tc superconductivity up to 55 K under high pressure in a heavily electron doped Li0.36(NH3)yFe2Se2 single crystal, **P. Shahi**, J.P. Sun, S.H. Wang, Y.Y Jiao, KY Chen, SS Sun, HC Lei, **Y Uwatoko,** B.S. Wang, J-G Cheng, Phys. Rev. B , ISSN: 1098-0121, (2018), 97, 020508, DOI: https://doi.org/10.1103/PhysRevB.97.020508. (Impact factor: 3.836)
11. Re-emergence of high-Tc superconductivity in the (Li1-xFex)OHFe1-ySe under high pressure, J.P. Sun, **P. Shahi**, H.X. Zhou, Y.L. Huang, K.Y. Chen, B.S. Wang, S.L. Ni, N.N. Li, K. Zhang, W.G. Yang, **Y. Uwatoko**, G. Xing, J. Sun, D.J. Singh, K. Jin, F. Zhou, G.M. Zhang, X.L. Dong, Z.X. Zhao, Nature Communications, ISSN: 2041-1723, (2018), 9, 380, DOI: https://doi.org/10.1038/s41467-018-02843-7. (Impact factor: 12.353)
12. Pressure-induced phase transitions and superconductivity in a black phosphorus single crystal, Xiang Li, Jianping Sun, **Prashant Shahi**, Miao Gao, Allan H MacDonald, **Yoshiya Uwatoko**, Tao Xiang, John B Goodenough, Jinguang Cheng, Jianshi Zhou, Proceedings of the National Academy of Sciences, ISSN: 0027-8424, (2018), 115, 9935-9940, DOI: https://doi.org/10.1073/pnas.1810726115. (Impact

factor: 9.504)

1. High-pressure synthesis and structural, transport, and magnetic properties of rutile-type Cr2ReO6 and CrReO4, Y.Y. Jiao, J.P. Sun, **P. Shahi**, Q. Cui, X.H. Yu, **Y. Uwatoko**, B.S. Wang, J.A. Alonso, H.M. Weng, J-G. Cheng, Physical Review B, ISSN: 1098-0121, (2018), 97, 014426, DOI:

https://doi.org/10.1103/PhysRevB.97.014426. (Impact factor: 3.836)

1. Effect of chemical and hydrostatic pressure on the cubic pyrochlore Cd2Ru2O7, Y.Y. Jiao, J.P. Sun**, P. Shahi**, Q. Cui, X.H. Yu, **Y. Uwatoko**, B.S. Wang, J.A. Alonso, H.M. Weng, J-G Cheng, Physical Review B, ISSN: 1098-0121, 2018, 98, 075118, DOI:https://doi.org/10.1103/PhysRevB.98.075118.

(Impact factor: 3.836)

1. Effect of high pressure on intercalated FeSe high-Tc superconductors, Sun Jian-Ping, **Prashant Shahi**, Zhou Hua-Xue, Ni Shun-Li, Wang Shao-Hua, Lei He-Chang, Wang Bo-Sen, Dong Xiao-Li, Zhao Zhong-Xian, Cheng Jin-Guang, ACTA PHYSICA SINICA, ISSN:1000-3290, 2018, 67, 207404, DOI:

10.7498/aps.67.20181319. (Impact factor: 0.813)

1. Effect of Pb doping on metallic state of cubic pyrochlore Cd2Ru2O7, Jiao Yuan-Yuan, Sun Jian-Ping, **Prashant Shahi**, Liu Zhe-Hong, Wang Bo-Sen, Long You-Wen, Cheng Jin-Guang, ACTA PHYSICA SINICA, ISSN:1000-3290, (2018), 67, 127402, DOI: 10.7498/aps.67.20180343. (Impact factor: 0.813)
2. Enhancement in power factor due to anti-correlation between electrical conductivity and thermoelectric power and induced magnetic ordering in high mobility Zn doped Bi2Te3, Abhishek Singh**, P. Shahi**,

A.K. Ghosh, J.G. Cheng, **Sandip Chatterjee**, Journal of Alloys and Compounds, ISSN: 0925-8388, (2018), 731, 297-302, DOI: https://doi.org/10.1016/j.jallcom.2017.10.039. (Impact factor: 3.779)

1. Pressure induced effects on the chemical and magnetic structure of spinel MnV2O4, Ripandeep Singh,

T. Hansen, C. Ritter, Neetika Sharma**, P. Shahi**, **S. Chatterjee**, A. Das, Journal of Physics: Condensed Matter, ISSN: 0953-8984, (2017), 29, 345802, DOI: https://doi.org/10.1088/1361-648X/aa7c3e.

(Impact factor: 2.617)

1. High-Tc Superconductivity in FeSe at High Pressure: Dominant Hole Carriers and Enhanced Spin Fluctuations, J.P. Sun, G.Z. Ye, **P. Shahi**, J-Q. Yan, K. Matsuura, H. Kontani, G.M. Zhang, Q. Zhou,

B.C. Sales, T. Shibauchi, **Y. Uwatoko,** D.J. Singh, J.-G. Cheng, Physical review letters, ISSN: 0031- 9007, (2017), 118, 147004, DOI: https://doi.org/10.1103/PhysRevLett.118.147004. (Impact factor:

8.839)

1. Effect of dilution of both A-and B-sites on the multiferroic properties of spinal Mott insulators, **Prashant Shahi**, Rahul K. Singh, Rajesh K. Singh, Shiv Kumar, A. Tiwari, A. Tripathi, J. Saha, S. Patnaik, A.K. Ghosh, **Sandip Chatterjee,** Materials Research Express, ISSN: 2053-1591, (2015), 2, 076501, DOI: https://doi.org/10.1088/2053-1591/2/7/076501. (Impact factor: 1.151)
2. Role of ion beam excitations on quasi one-dimensional magnetic system of Mn-doped LiCuVO4, Abhishek Kumar, GD Dwivedi, Shiv Kumar, **P. Shahi**, K.K. Shukla, A.K. Ghosh, K. Asokan, D. Kanjilal, R.K. Singh, A.K. Nigam, **Sandip Chatterjee,** Materials Chemistry and Physics, ISSN: 0254- 0584, 2015, 161, 19-25, DOI: https://doi.org/10.1016/j.matchemphys.2015.04.029. (Impact factor:

2.084)

1. Effect of Chemical Pressure at the Boundary of Mott Insulator to Itinerant Electron Limit Transition in Spinel Vanadates, **P. Shahi**, A. Kumar, Rahul Singh, Ripandeep Singh, P.U. Sastry, A. Das, Amish G Joshi, A.K. Ghosh, A. Banerjee, **Sandip Chatterjee,** Science of Advanced Materials, ISSN: 1947-2935, (2015), 7, 1187-1196, **DOI:** https://doi.org/10.1166/sam.2015.2247. (Impact factor: 1.318)
2. Neutron diffraction study of multiferroic Mo-doped CoFe2O4, A. Das, G.D. Dwivedi, Poonam Kumari,

**P. Shahi**, H.D. Yang, A.K. Ghosh**, Sandip Chatterjee**, Journal of Magnetism and Magnetic Materials, ISSN: 0304-8853, (2015), 379, 6-8, DOI: https://doi.org/10.1016/j.jmmm.2014.11.038. (Impact factor:

3.046)

1. Magnetic and optical properties of Fe doped crednerite CuMnO 2, Kaushal K. Shukla**, P. Shahi**, S. Gopal, A. Kumar, A.K. Ghosh, Ripandeep Singh, Neetika Sharma, A. Das, A.K. Sinha, Amish G. Joshi,

A.K. Nigam, **Sandip Chatterjee**, RSC. Advances, ISSN: 2046-2069, (2015), 5, 83504-83511, DOI: 10.1039/C5RA13305J. (Impact factor: 2.936)

1. Low temperature magnetic and transport properties of LSMO–PZT nanocomposites, Gopeshwar Dhar Dwivedi, Manish Kumar, **Prashant Shahi**, Anjan Barman, **Sandip Chatterjee**, Anup K. Ghosh, RSC Advances, ISSN: 2046-2069, (2015), 5, 30748-30757, DOI: 10.1039/C5RA13305J. (Impact factor:

2.936)

1. Transport, magnetic and structural properties of Mott insulator MnV2O4 at the boundary between localized and itinerant electron limit, **Prashant Shahi**, Saurabh Kumar, Neetika Sharma, Ripandeep Singh, P.U. Sastry, A. Das, A. Kumar, K.K. Shukla, A.K. Ghosh, A.K. Nigam, **Sandip Chatterjee**, Journal of materials science, ISSN: 0022-2461, 2014, 49, 7317-7324, DOI:

https://doi.org/10.1007/s10853-014-8444-4. (Impact factor: 2.993)

1. Effect of Zn doping on the magneto-caloric effect and critical constants of Mott insulator MnV2O4, **Prashant Shahi**, Harishchandra Singh, A. Kumar, K.K. Shukla, A.K. Ghosh, A.K. Yadav, A.K. Nigam, **Sandip Chatterjee**, AIP Advances, ISSN: 2158-3226, (2014), 4, 097137, DOI: https://doi.org/10.1063/1.4896955. (Impact factor: 1.653)
2. Effect of Pr- and Nd- doping on structural, dielectric, and magnetic properties of multiferroic Bi0.8La0.2Fe0.9Mn0.1O3, Rahul Singh, G.D. Dwivedi, **P. Shahi**, D. Kumar, Om Prakash, A.K. Ghosh, **Sandip Chatterjee**, Journal of Applied Physics, ISSN: 0021-8979, (2014), 115, 134102.DOI: 10.1063/1.4870454. (Impact factor: 2.176)
3. Structural and magnetic properties of quasi-one-dimensional doped LiCuVO4, Abhishek Kumar, Poonam Kumari, A. Das, G.D. Dwivedi**, P. Shahi**, K.K. Shukla, A.K. Ghosh, A.K. Nigam, K.K. Chattopadhyay, **Sandip Chatterjee**, Journal of Solid State Chemistry, ISSN: 0022-4596, (2013), 208, 120-126, DOI: https://doi.org/10.1016/j.jssc.2013.09.029. (Impact factor: 2.299)
4. Effect of Y-doping on the transport and magnetic properties of La0.5Sr0.5CoO3 and La0.7Sr0.3CoO3, G. Dwivedi, K. Shukla, **P. Shahi**, A. Ghosh, A. Nigam, **Sandip Chatterjee**, Journal of Materials Science, ISSN: 0022-2461, (2013), 48, 1997-2001, DOI: https://doi.org/10.1007/s10853-012-6966-1. (Impact

factor: 2.993)

1. Raman effect and magnetic properties of doped TbMnO3, A. Kumar, **P. Shahi**, S. Kumar, K.K. Shukla, Ranjan Kr. Singh, A.K. Ghosh, A.K. Nigam, **Sandip Chatterjee**, Journal of Physics D: Applied Physics, ISSN: 0022-3727, (2013), 46, 125001, DOI: https://doi.org/10.1088/0022-3727/46/12/125001.

(Impact factor: 2.373)

1. Existence of the multiferroic property at room temperature in Ti doped CoFe2O4, G.D. Dwivedi, Amish

 G. Joshi, H. Kevin, **P. Shahi**, A. Kumar, A.K. Ghosh, H.D. Yang, **Sandip Chatterjee**, Solid State Communications, ISSN: 0038-1098, (2012), 360-363, DOI: <https://doi.org/10.1016/j.ssc.2011.12.013>.

(Impact factor: 1.458)

1. Signature of ferroelectricity in magnetically ordered Mo-doped CoFe2O4, G.D. Dwivedi, K.F.Tseng,

C.L. Chan, **P. Shahi**, J. Lourembam, B. Chatterjee, A.K. Ghosh, H.D. Yang, **Sandip Chatterjee**,

Physical Review B, ISSN:1098-0121, (2010), 82, 134428 DOI: https://doi.org/10.1103/PhysRevB.82.134428. (Impact factor: 3.836

# Presentations and Invited Lectures

* “International Conference on Multifunctional Materials” (ICMM-2010), organized by Department of Physics, Banaras Hindu University, India. December 7–9, 2010.
* “International Conference on Physics of Emerging Functional Materials”(PEFM-2010), organized by Bhabha Atomic Research Centre, Mumbai, India. September 22-24, 2010.
* “International Conference on Theoretical and Applied Physics”(ICTAP) organized by Indian Institute of Technology, Kharagpur, India.December 1-2, 2011.
* “54th DAE-Solid State Physics Symposium” (DAE-SSPS), held at M.S. University of Baroda, Vadodara,(India), December 14–18, 2009.
* “Workshop on Multifunctional Materials” held at Dept. of Physics, B.H.U., Varanasi from December 06, 2010.
* National Seminar on “Recent Trends in Condensed Matter Physics” (RTCMP-2011) held at IIT–B.H.U., Varanasi(India), on March 05-06, 2011.
* National conference on “Thermo-physical Properties” (NCTP-2011) held at Deptt. of Physics, at IIT B.H.U.,Varanasi (India), on October 11-13, 2011.
* “58th DAE-Solid State Physics Symposium” (DAE-SSPS), held at Thapar University , Patiyala, (India), December 17–21, 2013.
* Summer School On *"Development And Characterization Of Advanced Materials"* organized by Department of Physics, Banaras Hindu University, India. February 22, 2013 to March 14, 2013.

# Visiting Fellow

* **ISSP, University of Tokyo, Japan.** Visited for collaborative research work from 19 Dec 2019 to 09 January 2020.
* **Inter University Accelerator Centre (IUAC), New Delhi, India** formerly Nuclear Science Centre (NSC) for Swift Heavy Ion (SHI) Irradiation experiments and other characterization tools viz. Raman Spectroscopy, AFM etc.
* **UGC-DAE, Indore** for Magnetic measurement from SQUID**.**
* **Raja Ramanna Centre for Advanced Technology (RRCAT), Indore, India** for Extended X-ray Absorption Fine Structure (EXAFS) measurements at INDUS-2 Synchrotron Source (2.5 GeV, 120 mA) beam line-8 (BL-8) and Synchrotron X-Ray measurement at INDUS-2 Synchrotron Source beamline-12.