

CURRICULUM VITAE

Dr. Santanu Pakhira

Email: spakhira.phy@gmail.com

Phone: +91-9062667749

Google Scholar: <https://scholar.google.co.in/citations?user=9gQE2IYAAAAJhl=en>

Permanent Address: Vill. - Nabin Manua, PO - Sitapur, West Medinipur, 721154, WB, India

Education

Ph.D., (2012-2018)	Physics	Saha Institute of Nuclear Physics, Kolkata, India (Degree awarded by University of Calcutta, Kolkata, India) <i>Thesis title: Synthesis and physical properties of magnetically frustrated $R_2\text{NiSi}_3$ (R = rare-earth) intermetallic compounds.</i> (Advisor: Prof. Chandan Mazumdar)
Post M.Sc., (2011-2012)	Physics	Saha Institute of Nuclear Physics, Kolkata, India
M.Sc., (2009-2011)	Physics	University of Calcutta, Kolkata, India (1 st class)
B.Sc., (2006-2009)	Physics	Ramakrishna Mission Residential College, Narendrapur, Kolkata, India (1 st class)

Research Positions

03/2024 – present	Assistant Professor, Maulana Azad National Institute of Technology (NIT Bhopal), India , (Level 12)
02/2023 – 03/2024	Postdoctoral Researcher, IQMT, Karlsruhe Institute of Technology, Germany (Mentor: Prof. Christoph Meingast & Prof. Amir-Abbas Haghighirad)
11/2018 – 01/2023	Postdoctoral Research Associate, Division of Materials Sciences and Engineering Ames National Laboratory, USA (Mentor: Prof. David C. Johnston)

Research Interests and methods

Subject area: Experimental Condensed Matter Physics and Materials Science

Systems interested in:

- Quantum materials with novel magnetic and superconducting properties
- Frustrated magnetism, Spin-glass behaviour, Low-dimensional magnetism
- Magnetic topological materials
- Rare-earth based materials
- Itinerant magnetic systems
- Heusler alloys

Experimental techniques:

- Single crystal growth using Flux-method, Chemical vapour transport (CVT) process, Czochralski method, Optical floating zone furnace, Bridgman technique
- Synthesis of polycrystalline materials by arc-melting, solid-state reaction
- X-ray diffraction/Laue method, scanning electron microscopy (SEM) & Energy-dispersive X-ray spectroscopy (EDS)
- Handling of liquid-Nitrogen, liquid-Helium, various Cryostat and other cryogenic techniques
- Low and high temperature magnetic properties measurements in various magnetic properties measurement setups, e.g. Magnetic Properties Measurement System(MPMS, Quantum Design Inc. USA), Ever Cool II VSM (Quantum Design Inc. USA), SQUID-VSM
- Transport properties, viz., heat capacity, resistivity, Hall effect, thermopower measurements,

and thermal expansion (Dilatometer) measurements in Physical Properties Measurement System (Quantum Design Inc. USA)

- Quartz tube sealing under vacuum
- Neutron diffraction

Softwares:

FullProf suite, Mathematica, Origin, Latex, C & Fortran, CrystalMaker, Vesta, LabVIEW.

List of Publications:

Published/Accepted

(Total: 59; **As first author/corresponding author: 32**)

(PNAS: 2; Physical Review B: 29; Nature Communications: 1; Nature Scientific Reports: 5; npj Quantum Materials: 1; Physical Review Materials: 1; Small: 1; Journal of Materials Chemistry C: 2; Journal of Alloys and Compounds: 4; ACS Applied Materials & Interfaces: 1; Physical Chemistry Chemical Physics: 2; Journal of Physics: Condensed Matter: 4; Intermetallics: 3; Journal of Magnetism and Magnetic Materials: 3)

Google Scholar matrix: Citations - 1086, h-index - 20, i10-index - 33

2025

1. **Santanu Pakhira**, Y Lee, Asish K. Kundu, F. Islam, Z. Ning, V. Smetana, A-V Mudring, T. Heitmann, E. Vescovo, Liqin Ke, D. Vaknin, and D. C. Johnston, Flat-Band Tuning and Emergent Itinerant Magnetism in $\text{Sr}(\text{Co}_{1-x}\text{Pd}_x)_2\text{As}_2$, [Accepted for publication in PNAS](#) (2025).
2. **Santanu Pakhira**, Liran Wang, NS Sangeetha, Aashish Sapkota, Teslin R Thomas, Andreas Kreyssig, Frédéric Hardy, Anna E Böhmer, Christoph Meingast, and David C Johnston, Magnetoelastic-coupling-assisted first-order antiferromagnetic transitions in the corrugated honeycomb-lattice compounds $(\text{Ca},\text{Sr})\text{Mn}_2\text{P}_2$, *Physical Review B* **112**, 104443 (September, 2025)(DOI:10.1103/x3t1-np4q)(Role: First and Corresponding author)).
3. Soumya Bhowmik, **Santanu Pakhira**, Renu Choudhary, Ravi Kumar, Rajashri Urkude, Biplab Ghosh, D Bhattacharyya, Maxim Avdeev, and Chandan Mazumdar, Al_2MnCu : A magnetically ordered member of the heusler alloy family despite having a valence electron count of 24, *Physical Review B* **111**, 174417 (May, 2025)(DOI:10.1103/PhysRevB.111.174417)(Role: Co-author)).
4. Sudip Chakraborty, Shuvankar Gupta, **Santanu Pakhira**, and Chandan Mazumdar, Detection of magnetic skyrmion-like feature in the magnetocaloric properties of $\text{Gd}_2\text{Ir}_{0.97}\text{Si}_{2.97}$, *Journal of Alloys and Compounds* **1014**, 178698 (February, 2025)(DOI:10.1016/j.jallcom.2025.178698)(Role: Corresponding author).
5. Suvayan Saha, Sanjib Banik, Apurba Dutta, Tapas Paramanik, **Santanu Pakhira**, Suman Dey, Sudipta Bandyopadhyay, Chandan Mazumdar, and I Das, Role of Co/Mn interaction in developing griffiths phase with reducing particle size in $\text{La}_2\text{CoMnO}_6$, *ACS Applied Materials & Interfaces* **17**, 20060–20074 (March, 2025)(DOI:10.1021/acsami.4c20456)(Role: Co-author).
6. Aryan Keshri, Sourav Chowdhury, Naveen Goyal, Wasim Akram, **Santanu Pakhira**, Peter Nagel, Stefan Schuppler, Sadanand Powar, Mohit Tanwani, Pushpendra Gupta, *et al.*, Orbital and Spin Reconstruction by Interface Symmetry Engineering in Oxide Superlattices, *Small*, 2500089 (May, 2025)(DOI:10.1002/sml.202500089)(Role: Co-author)).

7. Nour Maraytta, Peter Nagel, Fatemeh Ghorbani, Amir Ghiami, **Santanu Pakhira**, Mai Ye, Björn Wehinger, Federico Abbruciati, Gaston Garbarino, Matthieu Le Tacon, *et al.*, Unveiling excitonic insulator signatures in Ta₂NiSe₅ through structural and orbital probes, [Scientific Reports](#) **15**, 35019 (October, 2025)(DOI:10.1038/s41598-025-20909-7)(Role: Co-author)).

2024

8. Mily Kundu, **Santanu Pakhira**, Shuvankar Gupta, Renu Choudhary, Sourav Sarkar, N Lakshminarasimhan, R Ranganathan, Kalyan Mandal, Duane Johnson, and Chandan Mazumdar, Defect-induced formation and frustration driven multiple magnetic transitions in Gd₂Co_{0.90}Si_{2.90}, [Journal of Materials Chemistry C](#) **12**, 12292–12303 (July, 2023)(DOI:10.1039/D4TC01798F) (Role: Corresponding author) (**Selected as a Journal of Materials Chemistry C Hot Article 2024**).
9. Tianxiong Han, **Santanu Pakhira**, NS Sangeetha, SXM Riberolles, TW Heitmann, Yan Wu, DC Johnston, RJ McQueeney, and BG Ueland, Europium *c*-axis ferromagnetism in Eu(Co_{1-x}Ni_x)_{2-y}As₂: A single-crystal neutron diffraction study, [Physical Review B](#) **109**, 174428 (May, 2024)(DOI:10.1103/PhysRevB.109.174428) (Role: Co-author).
10. A.K. Kundu, X. Huang, E. Seewald, E. Ritz, **Santanu Pakhira**, S. Zhang, D. Sun, S. Turkel, S. Shabani, T. Yilmaz, E. Vescovo, C. R. Dean, D. C. Johnston, T. Valla, T. Birol, D. N. Basov, R. M. Fernandes, and A. N. Pasupathy, Low-energy electronic structure in the unconventional charge-ordered state of ScV₆Sn₆, [Nature Communications](#) **15**, 5008 (June, 2024)(DOI:10.1038/s41467-024-48883-0)(Role: Co-author).
11. Sudip Chakraborty, Shuvankar Gupta, **Santanu Pakhira**, Shovan Dan, Anis Biswas, Yaroslav Mudryk, and Chandan Mazumdar, Large adiabatic temperature change and magnetic frustration in triangular lattice antiferromagnet Dy₂IrSi₃, [Journal of Alloys and Compounds](#) **981**, 173652 (January, 2024)(DOI:10.1016/j.jallcom.2024.173652) (Role: Co-author).
12. Farhan Islam, Deborah Schlagel, Yongbin Lee, **Santanu Pakhira**, Daniel M Pajerowski, David C. Johnston, Liqin Ke, David Vaknin, and Robert J McQueeney, Coexistence of Ferromagnetism and Antiferromagnetic Dimers in Topological Insulators, [Physical Review B](#) **110**, 014408 (July, 2024)(DOI:10.1103/PhysRevB.110.014408) (Role: Co-author) (**Editors' suggestion**).

2023

13. **Santanu Pakhira**, Asish K Kundu, Farhan Islam, M.A. Tanatar, Tufan Roy, Thomas Heitmann, T. Yilmaz, E. Vescovo, Masahito Tsujikawa, Masafumi Shirai, R. Prozorov, David Vaknin, and David C. Johnston, Anisotropic magnetism and electronic structure of trigonal EuAl₂Ge₂ single crystals, [Physical Review B](#) **107**, 134439 (April, 2023)(DOI:10.1103/PhysRevB.107.134439) (Role: First author).
14. **Santanu Pakhira** and D. C. Johnston, Low-field magnetic anomalies in single crystals of the A-type square-lattice antiferromagnet EuGa₄, [Physical Review B](#) **107**, 024421 (10 pages) (March, 2023) (DOI:10.1103/PhysRevB.107.024421) (Role: First author).
15. Mily Kundu, **Santanu Pakhira**, Renu Choudhary, Shuvankar Gupta, Sudip Chakraborty, N Lakshminarasimhan, R Ranganathan, Duane D Johnson, and Chandan Mazumdar, Magnetic frustration driven by conduction carrier blocking in Nd₂Co_{0.85}Si_{2.88}, [Physical Review B](#) **107**, 094421 (17 pages) (March, 2023) (DOI:10.1103/PhysRevB.107.094421) (Role: Corresponding author).
16. Shuvankar Gupta, Sudip Chakraborty, **Santanu Pakhira**, Anis Biswas, Yaroslav Mudryk, Amit Kumar, Bodhoday Mukherjee, Gunadhor S Okram, Amitabh Das, Vitalij K Pecharsky,

- and Chandan Mazumdar, Experimental observation of spin glass state in the highly disordered quaternary Heusler alloy FeRuMnGa, [Physical Review B](#) **107**, 184408 (May, 2023)(DOI:10.1103/PhysRevB.107.184408) (Role: Corresponding author).
17. Farhan Islam, Thaís V Trevisan, Thomas Heitmann, **Santanu Pakhira**, Simon. X. M. Riberolles, N. S. Sangeetha, David C Johnston, Peter P Orth, and David Vaknin, Frustrated magnetic cycloidal structure and emergent potts nematicity in CaMn₂P₂, [Physical Review B](#) **107**, 054425 (14 pages) (February, 2023) (DOI:10.1103/PhysRevB.107.054425) (Role: Co-author).
 18. Shuvankar Gupta, Sudip Chakraborty, Vidha Bhasin, **Santanu Pakhira**, Shovan Dan, Celine Barreateau, Jean-Claude Crivello, SN Jha, Maxim Avdeev, Jean Marc Greneche, D. Bhattacharyya, E. Alleno, and Chandan Mazumdar, High spin-polarization in a disordered novel quaternary heusler alloy FeMnVGa, [Physical Review B](#) **108**, 045137 (July, 2023)(DOI:10.1103/PhysRevB.108.045137) (Role: Co-author).
 19. Shuvankar Gupta, Sudip Chakraborty, Vidha Bhasin, **Santanu Pakhira**, Anis Biswas, Yaroslav Mudryk, Amit Kumar, Celine Barreateau, Jean-Claude Crivello, Amitabh Das, S. N. Jha, D. Bhattacharyya, Vitalij K Pecharsky, Eric Alleno, and Chandan Mazumdar, 4d-element induced improvement of structural disorder and development of weakly re-entrant spin-glass behaviour in NiRuMnSn, [Physical Review B](#) **108**, 054405 (August, 2023)(DOI:10.1103/PhysRevB.108.054405) (Role: Co-author).
 20. Sudip Chakraborty, Shuvankar Gupta, **Santanu Pakhira**, Anis Biswas, Yaroslav Mudryk, Renu Choudhary, Amit Kumar, Amitabh Das, and Chandan Mazumdar, Origin of magnetic ordering in half-heusler RuMnGa, [Physical Review B](#) **108**, 054430 (August, 2023)(DOI:10.1103/PhysRevB.108.054430) (Role: Co-author).
 21. C Dissanayake, A. C. Jacko, K. Kumarasinghe, R. Munir, H. Siddiquee, W. J. Newsome, F. J. Uribe-Romo, E. S. Choi, S. Yadav, X. Z. Hu, Y. Takano, **Santanu Pakhira**, D. C. Johnston, Q. P. Ding, Y. Furukawa, B. J. Powell, and Y. Nakajima, Gapless spinons and a field-induced soliton gap in the hyper-honeycomb Cu oxalate framework compound [(C₂H₅)₃NH]₂Cu₂(C₂O₄)₃, [Physical Review B](#) **108**, 134418 (October, 2023)(DOI:10.1103/PhysRevB.108.134418) (Role: Co-author) (**Editors' suggestion**).
 22. Shuvankar Gupta, Sudip Chakraborty, Vidha Bhasin, **Santanu Pakhira**, Shovan Dan, Celine Barreateau, Jean-Claude Crivello, Shambhu Nath Jha, Maxim Avdeev, B Dibyendu, V Paul-Boncour, and Chandan Mazumdar, CoMnCrGa: A Novel Ferromagnetic Material with High Spin-Polarization for Room Temperature Spintronics, [Journal of Materials Chemistry C](#) **11**, 15489 (October, 2023)(DOI:10.1039/d3tc02813e) (Role: Co-author).
 23. Sudip Chakraborty, Shuvankar Gupta, Vidha Bhasin, **Santanu Pakhira**, Celine Barreateau, Jean-Claude Crivello, S. N. Jha, D. Bhattacharyya, M Avdeev, V. Paul-Boncour, Jean-Marc Greneche, Eric Alleno, and Chandan Mazumdar, Observation of charge transfer induced large enhancement of magnetic moment in a structurally disordered inverse heusler alloy Fe₂RuGe, [Physical Review B](#) **108**, 245151 (December, 2023)(DOI:10.1103/PhysRevB.108.245151) (Role: Co-author).

2022

24. **Santanu Pakhira**, Yongbin Lee, Liqin Ke, and David C. Johnston, Magnetic-field-induced ab-plane rotation of the Eu magnetic moments in trigonal EuMg₂Bi₂ and EuMg₂Sb₂ single crystals below their Neel temperatures, [Physical Review B](#) **106**, 184423 (10 pages) (November, 2022) (DOI:10.1103/PhysRevB.106.184423) (Role: First author).
25. **Santanu Pakhira**, Farhan Islam, Evan O'Leary, M. A. Tanatar, Thomas Heitmann, R. Pro-

- zorov, Adam Kaminski, David Vaknin, and D. C. Johnston, A-type antiferromagnetic order in semiconducting EuMg_2Sb_2 single crystals, [Physical Review B](#) **106**, 024418 (14 pages) (July, 2022) (DOI:10.1103/PhysRevB.106.024418) (Role: First author).
26. Asish K Kundu, **Santanu Pakhira**, Tufan Roy, T. Yilmaz, Masahito Tsujikawa, Masafumi Shirai, E. Vescovo, D. C. Johnston, Abhay N. Pasupathy, and Tonica Valla, Electronic and magnetic properties of the topological semimetal SmMg_2Bi_2 , [Physical Review B](#) **106**, 245131 (10 pages) (December, 2022) (DOI:10.1103/PhysRevB.106.245131) (Role: Co-author).
 27. Sudip Chakraborty, Shuvankar Gupta, **Santanu Pakhira**, Renu Choudhary, Anis Biswas, Yaroslav Mudryk, Vitalij K. Pecharsky, Duane D. Johnson, and Chandan Mazumdar, Ground-state degeneracy and complex magnetism of geometrically frustrated $\text{Gd}_2\text{Ir}_{0.97}\text{Si}_{2.97}$, [Physical Review B](#) **106**, 224427 (13 pages) (December, 2022) (DOI:10.1103/PhysRevB.106.224427) (Role: Co-author).
 28. Shuvankar Gupta, Sudip Chakraborty, **Santanu Pakhira**, Celine Barreteau, Jean-Claude Crivello, Bilwadal Bandyopadhyay, Jean Marc Greneche, Eric Alleno, and Chandan Mazumdar, Coexisting structural disorder and robust spin-polarization in half-metallic FeMnVAl , [Physical Review B](#) **106**, 115148 (12 pages) (September, 2022) (DOI:10.1103/PhysRevB.106.115148) (Role: Co-author).
 29. Mily Kundu, **Santanu Pakhira**, Durga Paudyal, N. Lakshminarasimhan, R. Ranganathan, and Chandan Mazumdar, Magnetocaloric response with significant mechanical efficiency in frustrated intermetallic compound $\text{Pr}_2\text{Co}_{0.86}\text{Si}_{2.88}$, [Intermetallics](#) **151**, 107730 (6 pages) (September, 2022) (DOI:10.1016/j.intermet.2022.107730) (Role: Corresponding author).
 30. Asish K. Kundu, Tufan Roy, **Santanu Pakhira**, Ze-Bin Wu, Masahito Tsujikawa, Masafumi Shirai, D. C. Johnston, Abhay N. Pasupathy, and Tonica Valla, Topological electronic structure of YbMg_2Bi_2 and CaMg_2Bi_2 , [npj Quantum Materials](#) **7**, 67 (9 pages) (June, 2022) (DOI:10.1038/s41535-022-00474-2) (Role: Co-author).
 31. Q.-P. Ding, **Santanu Pakhira**, N. S. Sangeetha, E. H. Krenkel, E. I. Timmons, M. A. Tanatar, R. Prozorov, D. C. Johnston, and Y. Furukawa, Itinerant G-type antiferromagnet SrCr_2As_2 studied by magnetization, heat capacity, electrical resistivity, and NMR measurements, [Physical Review B](#) **105**, 134408 (13 pages) (April, 2022) (DOI:10.1103/PhysRevB.105.134408) (Role: Co-author).
 32. Q.-P. Ding, C. Dissanayake, **Santanu Pakhira**, W. J. Newsome, F. Uribe-Romo, D. C. Johnston, Y. Nakajima, and Y. Furukawa, Slow spin dynamics in the hyperhoneycomb lattice $[(\text{C}_2\text{H}_5)_3\text{NH}]_2\text{Cu}_2(\text{C}_2\text{O}_4)_3$ revealed by ^1H NMR studies, [Physical Review B \(Lett.\)](#) **105**, L100405 (6 pages) (March, 2022) (DOI:10.1103/PhysRevB.105.L100405) (Role: Co-author).
- 2021**
33. **Santanu Pakhira**, M. A. Tanatar, Thomas Heitmann, David Vaknin, and D. C. Johnston, A-type antiferromagnetic order and magnetic phase diagram of the trigonal Eu spin-7/2 triangular-lattice compound EuSn_2As_2 , [Physical Review B](#) **104**, 174427 (15 pages) (November, 2021) (DOI:10.1103/PhysRevB.104.174427) (Role: First author).
 34. **Santanu Pakhira**, Y. Lee, Liqin Ke, V. Smetana, A.-V. Mudring, Thomas Heitmann, David Vaknin, and D. C. Johnston, Suppression of antiferromagnetic order and strong ferromagnetic spin fluctuations in $\text{Ca}(\text{Co}_{1-x}\text{Ni}_x)_{2-y}\text{As}_2$ single crystals, [Physical Review B](#) **104**, 094420 (18 pages) (September, 2021) (DOI:10.1103/PhysRevB.104.094420) (Role: First author).
 35. **Santanu Pakhira**, Thomas Heitmann, S. X. M. Riberolles, B. G. Ueland, R. J. McQueeney, D. C. Johnston, and David Vaknin, Zero-field magnetic ground state of EuMg_2Bi_2 , [Physi-](#)

- [cal Review B](#) **103**, 024408 (6 pages) (January, 2021) (DOI:10.1103/PhysRevB.103.024408) (Role: First author).
36. **Santanu Pakhira**, A. V. Morozkin, Maxim Avdeev, and Chandan Mazumdar, Magnetic structure of triangular lattice compound $\text{Tb}_2\text{Ni}_{0.90}\text{Si}_{2.94}$, [Journal of Magnetism and Magnetic Materials](#) **536**, 168083 (4 pages) (May, 2021) (DOI:10.1016/j.jmmm.2021.168083) (Role: First author).
 37. B. G. Ueland, **Santanu Pakhira**, Bing Li, A Sapkota, N. S. Sangeetha, T. G. Perring, Y. Lee, Liqin Ke, D. C. Johnston, and R. J. McQueeney, Carrier tuning of stoner ferromagnetism in ThCr_2Si_2 -structure cobalt arsenides, [Physical Review B \(Lett.\)](#) **104**, L220410 (6 pages) (December, 2021) (DOI:10.1103/PhysRevB.104.L220410) (Role: Co-author).
 38. N. S. Sangeetha, **Santanu Pakhira**, Q.-P. Ding, Lennard Krause, H.-C. Lee, V. Smetana, A.-V. Mudring, B. B. Iversen, Y. Furukawa, and D. C. Johnston, First-order transitions at the Néel temperatures of trigonal SrMn_2P_2 and CaMn_2P_2 single crystals containing corrugated-honeycomb Mn sublattices, [PNAS](#) **118**, e2108724118 (8 pages) (October, 2021) (DOI:10.1073/pnas.2108724118) (Role: Co-author).
 39. Mily Kundu, **Santanu Pakhira**, Renu Choudhary, Durga Paudyal, N. Lakshminarasimhan, Maxim Avdeev, Stephen Cottrell, Devashibhai Adroja, R. Ranganathan, and Chandan Mazumdar, Complex magnetic properties associated with competing local and itinerant magnetism in $\text{Pr}_2\text{Co}_{0.86}\text{Si}_{2.88}$, [Scientific reports](#) **11**, 13245 (20 pages) (June, 2021) (DOI:10.1038/s41598-021-90751-0) (Role: Co-author).
- 2020**
40. **Santanu Pakhira**, M. A. Tanatar, and D. C. Johnston, Magnetic, thermal, and electronic-transport properties of EuMg_2Bi_2 single crystals, [Physical Review B](#) **101**, 214407 (14 pages) (June, 2020) (DOI:10.1103/PhysRevB.101.214407) (Role: First author).
 41. **Santanu Pakhira**, N. S. Sangeetha, V. Smetana, A.-V. Mudring, and D. C. Johnston, Short-range ferromagnetic order due to Ir substitutions in single-crystalline $\text{Ba}(\text{Co}_{1-x}\text{Ir}_x)_2\text{As}_2$ ($0 \leq x \leq 0.25$), [Journal of Physics: Condensed Matter](#) **33**, 115802 (12 pages) (December, 2020) (DOI:10.1088/1361-648X/abd339) (Role: First author).
 42. **Santanu Pakhira**, Mily Kundu, R. Ranganathan, and Chandan Mazumdar, Studies on magnetocaloric effect of $\text{Tb}_2\text{Ni}_{0.90}\text{Si}_{2.94}$ compound, [Journal of Physics: Condensed Matter](#) **33**, 095804 (6 pages) (December, 2020) (DOI:10.1088/1361-648X/abcbd2) (Role: First author).
 43. **Santanu Pakhira**, N. S. Sangeetha, V. Smetana, A.-V. Mudring, and D. C. Johnston, Ferromagnetic cluster-glass phase in $\text{Ca}(\text{Co}_{1-x}\text{Ir}_x)_{2-y}\text{As}_2$ crystals, [Physical Review B](#) **102**, 024410 (16 pages) (July, 2020) (DOI:10.1103/PhysRevB.102.024410) (Role: First author).
 44. **Santanu Pakhira**, R.N. Bhowmik, Maxim Avdeev, R. Ranganathan, and Chandan Mazumdar, Modification of magnetic ground state in $\text{Tb}_2\text{Ni}_{0.90}\text{Si}_{2.94}$ by thermal annealing, [Intermetallics](#) **124**, 106874 (7 pages) (June, 2020) (DOI:10.1016/j.intermet.2020.106874) (Role: First author).
 45. **Santanu Pakhira**, R. Ranganathan, and Chandan Mazumdar, Resistivity and magnetoresistance properties of R_2NiSi_3 ($\text{R} = \text{Gd, Dy, Ho, Er, Tm}$) compounds, [Journal of Magnetism and Magnetic Materials](#) **512**, 167055 (6 pages) (May, 2020) (DOI:10.1016/j.jmmm.2020.167055) (Role: First author).
 46. David Vaknin, **Santanu Pakhira**, D. Schlagel, Farhan Islam, Jianhua Zhang, D. M. Pajerowski, Cai-Zhuang Wang, D. C. Johnston, and R. J. McQueeney, Localized singlets and ferromagnetic fluctuations in the dilute magnetic topological insulator $\text{Sn}_{0.95}\text{Mn}_{0.05}\text{Te}$, [Physical Review B](#) **101**, 140406(R) (5 pages) (April, 2020) (DOI:10.1103/PhysRevB.101.140406)

(Role: Co-author).

47. N. S. Sangeetha, **Santanu Pakhira**, D. H. Ryan, V. Smetana, A.-V. Mudring, and D. C. Johnston, Magnetic phase transitions in $\text{Eu}(\text{Co}_{1-x}\text{Ni}_x)_{2-y}\text{As}_2$ single crystals, [Phys. Rev. Materials](#) **4**, 084407 (23 pages) (August, 2020) (DOI:10.1103/PhysRevMaterials.4.084407) (Role: Co-author).

2019

48. **Santanu Pakhira**, Chandan Mazumdar, Maxim Avdeev, R.N. Bhowmik, and R. Ranganathan, Spatially limited antiferromagnetic order in a cluster glass compound $\text{Tb}_2\text{Ni}_{0.90}\text{Si}_{2.94}$, [Journal of Alloys and Compounds](#) **785**, 72–79 (8 pages) (January, 2019) (DOI:10.1016/j.jallcom.2019.01.123) (Role: First author).
49. **Santanu Pakhira**, Chandan Mazumdar, and R. Ranganathan, Magnetocaloric properties of cluster glass compound $\text{Pr}_2\text{Ni}_{0.95}\text{Si}_{2.95}$, [Intermetallics](#) **111**, 106490 (4 pages) (May, 2019) (DOI:10.1016/j.intermet.2019.106490) (Role: First author).
50. **Santanu Pakhira**, Chandan Mazumdar, and R. Ranganathan, Magnetic and magnetocaloric properties of $(\text{Gd}_{1-x}\text{Y}_x)_2\text{NiSi}_3$ compounds ($x = 0.25, 0.5, 0.75$), [Journal of Magnetism and Magnetic Materials](#) **484**, 456–461 (6 pages) (April, 2019) (DOI:10.1016/j.jmmm.2019.04.021) (Role: First author).

2018

51. **Santanu Pakhira**, Chandan Mazumdar, Abhik Basu, R. Ranganathan, R.N. Bhowmik, and Biswarup Satpati, Unusual bidirectional frequency dependence of dynamical susceptibility in hexagonal intermetallic $\text{Pr}_2\text{Ni}_{0.95}\text{Si}_{2.95}$, [Scientific reports](#) **8**, 14870 (15 pages) (October, 2018) (DOI:10.1038/s41598-018-32740-4) (Role: First author).
52. **Santanu Pakhira**, Chandan Mazumdar, Dibyasree Choudhury, R. Ranganathan, and S. Giri, Observation of short range order driven large refrigerant capacity in chemically disordered single phase compound $\text{Dy}_2\text{Ni}_{0.87}\text{Si}_{2.95}$, [Physical Chemistry Chemical Physics](#) **20**, 13580–13587 (8 pages) (April, 2018) (DOI:10.1039/c8cp01280f) (Role: First author).
53. **Santanu Pakhira**, Asish K. Kundu, Chandan Mazumdar, and R. Ranganathan, Role of random magnetic anisotropy on the valence, magnetocaloric and resistivity properties in a hexagonal $\text{Sm}_2\text{Ni}_{0.87}\text{Si}_{2.87}$ compound, [Journal of Physics: Condensed Matter](#) **30**, 215601 (9 pages) (April, 2018) (DOI:10.1088/1361-648X/aabc22) (Role: First author).
54. **Santanu Pakhira**, Chandan Mazumdar, R. Ranganathan, and S. Giri, Chemical disorder driven reentrant spin cluster glass state formation and associated magnetocaloric properties of $\text{Nd}_2\text{Ni}_{0.94}\text{Si}_{2.94}$, [Physical Chemistry Chemical Physics](#) **20**, 7082–7092 (11 pages) (February, 2018) (DOI:10.1039/c7cp08574e) (Role: First author).
55. **Santanu Pakhira**, Chandan Mazumdar, R. Ranganathan, and S. Giri, Magnetic phase inhomogeneity in frustrated intermetallic compound $\text{Sm}_2\text{Ni}_{0.87}\text{Si}_{2.87}$, [Journal of Alloys and Compounds](#) **742**, 391–401 (11 pages) (January, 2018) (DOI:10.1016/j.jallcom.2018.01.145) (Role: First author).

2017

56. **Santanu Pakhira**, Chandan Mazumdar, and R. Ranganathan, Low-field induced large magnetocaloric effect in $\text{Tm}_2\text{Ni}_{0.93}\text{Si}_{2.93}$: influence of short-range magnetic correlation, [Journal of Physics: Condensed Matter](#) **29**, 505801 (5 pages) (November, 2017) (DOI:10.1088/1361-648X/aa9736) (Role: First author).
57. **Santanu Pakhira**, Chandan Mazumdar, R. Ranganathan, and Maxim Avdeev, Magnetic frustration induced large magnetocaloric effect in the absence of long range magnetic or-

der, [Scientific reports](#) **7**, 7367 (8 pages) (August, 2017) (DOI:10.1038/s41598-017-07459-3) (Role: First author).

58. Papri Dasgupta, Kalipada Das, **Santanu Pakhira**, Chandan Mazumdar, S. Mukherjee, S. Mukherjee, and A. Poddar, Role of the stability of charge ordering in exchange bias effect in doped manganites, [Scientific reports](#) **7**, 3220 (11 pages) (June, 2017) (DOI:10.1038/s41598-017-03451-z) (Role: Co-author).

2016

59. **Santanu Pakhira**, Chandan Mazumdar, R. Ranganathan, S. Giri, and Maxim Avdeev, Large magnetic cooling power involving frustrated antiferromagnetic spin-glass state in R_2NiSi_3 ($R = Gd, Er$), [Physical Review B](#) **94**, 104414 (15 pages) (September, 2016) (DOI:10.1103/PhysRevB.94.104414) (Role: First author).

Contributed conference proceedings

1. **Santanu Pakhira**, Chandan Mazumdar, and R. Ranganathan, Magnetic relaxation behaviour in Pr_2NiSi_3 , in [AIP Conference Proceedings](#), Vol. 1728 (AIP Publishing LLC, 2016) (DOI:10.1063/1.4946107) (Role: First author) p. 020056 (4 pages).
2. **Santanu Pakhira**, Chandan Mazumdar, and R. Ranganathan, Magnetic properties of inter-metallic compound Pr_2NiSi_3 , in [AIP Conference Proceedings](#), Vol. 1665 (AIP Publishing LLC, 2015) (DOI:10.1063/1.4918167) (Role: First author) p. 130019 (2 pages).

Ongoing Project

CRS Project entitled "Tuning the flat-band magnetism in itinerant frustrated systems" for the usage of experimental facilities at UGC-DAE CSR Indore during 03/2025 to 02/2028 (Role: PI).

Contributed Presentations

- Presented a paper as a poster in the International Conference on Magnetic Materials and Applications (MagMA) at IIT Guwahati, India during December 5-7, 2013.
- Presented an oral presentation in 7th Central European Training School on Neutron Scattering held in Budapest Neutron Centre, Budapest, Hungary from May 27-31, 2013.
- Presented a paper as a poster in the 59th DAE Solid State Physics Symposium at VIT University, Vellore, India during December 16-20, 2014.
- Presented a paper as a poster in the International Conference on Condensed Matter and Applied Physics (ICC) at Dept. of Physics, Govt. Engineering College Bikaner, India during October 30-31, 2015.
- Presented a paper as a poster in the 60th DAE Solid State Physics Symposium at Amity University, Noida, India during December 21-25, 2015.
- Presented a paper as a poster in the International Conference on Strongly Correlated Electron Systems (SCES) held in Prague, Czech Republic during July 17-21, 2017.
- Presented a seminar at IBS Center for Correlated Electron Systems, Seoul National University, Seoul, South Korea on March 19, 2018, hosted by Prof. Je-Geun Park.
- Presented an oral presentation in APS March Meeting, 2022, Chicago, USA.
- Presented a seminar at Institute for Quantum Materials and Technologies (IQMT) in Karlsruhe Institute of Technology, Germany, August-2022.
- Presented a seminar at University of the Witwatersrand, Johannesburg, South Africa, October-2022.
- Delivered an Invited talk at "2nd International Conference on Materials for Sustainable Development and Technologies (ICMSDT-2024)" at Central University of Jammu, April 2024.

- Delivered an Invited talk in "Short-Term Training Course on X-Ray Diffraction: Theory, Methods and Workflow (XRD 2024)" MANIT Bhopal, July 2024.
- Delivered an Expert talk on "Magnetism and Superconductivity for mankind" at SISTec Bhopal on National Science Day 2025.
- Delivered an Invited talk at 4th International Conference on Convergence of Interdisciplinary Science, 2025 (iC2IS 2025) organized by Science Dialectica, India.

Professional Activities

- Reviewed articles for Nature Communications, Physical Review Letters, Physical Review B, Physical Review Materials, Applied Physics letters, Journal of Alloys and Compounds, Journal of Physics: Condensed Matter, Journal of Materials Chemistry C, Journal of Physics and Chemistry of Solids, Journal of Magnetism and Magnetic Materials, Journal of Low Temperature Physics, Metals, Crystal.
- Selected as a chair for a focussed session in the APS March Meeting 2022, Chicago, USA.
- Participated at the 7th Central European Training School on Neutron Scattering organized by Budapest Neutron Centre and the Hungarian Academy of Sciences, Budapest, Hungary from May 27-31, 2013.
- Attended DST-SERC school on Advanced Functional Magnetic Materials held at Goa University, India from February 3-21, 2014.

Pre Ph.D Completed Projects

- A project on 'Cellular Automata' under the supervision of Prof. P. K. Mohanty, Saha Institute of Nuclear Physics, Kolkata.
- A project on 'Geometrically frustrated magnetism in Intermetallic Compounds' under the supervision of Prof. Chandan Mazumdar, Saha Institute of Nuclear Physics, Kolkata.

Proposals

- Open call proposal for neutron diffraction experiments got accepted in ANSTO, Australia.
- Open call proposal for μ -SR measurements got accepted in ISIS-RAL, UK.
- Proposal for highly competitive JSPS postdoctoral fellowship got accepted.

Fellowships and Awards

- Merit-cum-Means Scholarship by Govt. of West Bengal, India for Secondary results.
- Merit-cum-Means Scholarship by Govt. of West Bengal, India for Higher Secondary results.
- Merit-cum-Means Scholarship by Govt. of West Bengal, India for Graduation results.
- CSIR-UGC National Eligibility Test for Lectureship (All India basis) Dec, 2010.
- Junior Research Fellowship (JRF) by Saha Institute of Nuclear Physics, Kolkata, India, 2011.
- Senior Research Fellowship (SRF) by Saha Institute of Nuclear Physics, Kolkata, India, 2013.
- International Travel Support award by SERB, Govt. of India, 2017.
- Postdoctoral Research Associateship by Saha Institute of Nuclear Physics, Kolkata, India, 2018.
- **JSPS** Postdoctoral Fellowship Award by the Japan Society for the Promotion of Sciences, 2018.
- Postdoctoral Fellowship by Ames Laboratory, US-Department of Energy, USA, 2018.
- Top Cited Paper Award 2020 India by IOP Publishing.
- Postdoctoral Research Excellence Award by Iowa State University, USA, 2022.

Mentoring Experience

- Trained and co-supervised several trainees, summer-project students, and junior research fellows at Saha Institute of Nuclear Physics, Kolkata, India
- Trained undergraduate students in Physics lab courses at Iowa State University, USA

- Trained undergraduate students in crystal growths at KIT, Germany

Personal details

Present Address:

A-605, Riviera Heights
Bhopal, M.P., 462003

Permanent Address:

Vill - Nabin Manua, PO - Sitapur
West Medinipur, West Bengal - 721154, India

Date of birth: 06/06/1989

Marital status: Married

References

1. Prof. Chandan Mazumdar (Ph. D. Thesis supervisor)
Senior Professor
Condensed Matter Physics Division
Saha Institute of Nuclear Physics
1/AF, Bidhannagar,
Kolkata-700064 (WB), India
Tel: +91-33-23375345 to 49 (Ext. 2460), Fax: +91-33-23374637
E-mail: chandan.mazumdar@saha.ac.in
2. Prof. David C. Johnston (Postdoctoral mentor)
Distinguished Professor
Ames National Laboratory and Department of Physics and Astronomy,
Iowa State University
Ames-50011 (Iowa), USA
Tel: +1-515-294-5435, Fax: +1-515-2940689
Email: dcj99@ameslab.gov; dcjohnston9@gmail.com
3. Prof. David Vaknin (Collaborator)
Professor
Ames National Laboratory and Department of Physics and Astronomy,
Iowa State University
Ames-50011 (Iowa), USA
Tel: +1-515-294-6023, Fax: +1-515-2940689
Email: vaknin@ameslab.gov
4. Prof. Saurav Giri (Collaborator)
Senior Professor
Indian Association For The Cultivation Of Science,
2A & B Raja S C Mullick Road Kolkata 700032
Tel: +91-9432488554, Fax: +91-33-24732805
Email: sspsg2@iacs.res.in
5. Prof. Christoph Meingast (Collaborator)
Researcher
Institute for Quantum Materials and Technologies (IQMT)
Karlsruhe Institute of Technology
Karlsruhe, Germany
Tel: +49 1771754978
Email: Christoph.Meingast@kit.edu
6. Dr. Amir Abbas Haghighirad (Collaborator)
Researcher
Institute for Quantum Materials and Technologies (IQMT)
Karlsruhe Institute of Technology
Karlsruhe, Germany
Tel: +49 17653565539
Email: amir-abbas.haghighirad@kit.edu