

Name of Faculty Dr. S. SHANMUKHARAO SAMATHAM

Designation ASSISTANT PROFESSOR

Nature of Job/Appointment Regular

Date of Joining 11-10-2021

E-mail shanmukharao_physics@cbit.ac.in



Education Qualifications	Name of the Degree	Class
Post-Doctoral Fellow	IIT Bombay	Completed
Post-Doctoral Fellow	Daeugu-Gyeongbuk Institute of Science and Technology (DGIST), South Korea	Completed
Ph. D.	Physics (UGC-DAE CSR, INDORE)	Awarded
M.Phil.	Physics (UGC-DAE CSR, INDORE)	First
PG	M. Sc. (Physics)	First
UG	B. Sc. (MPC)	First
Work Experience		
Teaching	05 Years	
Research	12 Years	
Area of Specialization	Materials Physics, Magnetic Materials, Magnetic refrigeration materials, strongly correlated electron systems, quantum materials with quantum phase transition and critical point, unusual and novel magnetic ground states, topological materials.	
Professional Memberships	1. American Physical Society (APS) Regular No: 62147468 2. International Association of Engineers (IAENG) No. 323136 3. Associate Member of IAOP No. IAOP-98840	
Responsibilities held at Institution Level	1. Criterion In-charge: NAAC 3.6.3 & 3.6.4, SSR Report 2023 2. Convener for Research Day 2022	
Responsibilities held at Department Level	1. Coordinator-NIRF to till date. 2. Coordinator-NAAC-Research Related Information	
Research Guidance/Projects	1. SERB-Core Research Grant (CRG/2022/007993) of about 48 Lakh "Exploring spin caloritronic materials for waste heat management, magnetic refrigeration and EMI shielding applications" Role: PI Status: ONGOING 2. UGC-DAE CSR-Collaborative Research Scheme (CRS/2022-23/1061) "Tailoring magneto-transport phenomena in magnetic skyrmion materials $Mn_{1-x}Cr_xSi$ and $MnSi_{1-x}Sn_x$ " Role: Principal Investigator Status: ONGOING (Approved) 3. UGC-DAE CSR-Collaborative Research Scheme (CRS/2022-23/1206) "Exploring doped-MnNiGe ribbons for magnetocaloric, magnetoresistance and EMI shielding applications" Role: Co-Investigator Status: ONGOING 4. DST-RSF International Indo-Russia Bilateral Research Grant (DST/INT/RUS/RSF/P-47/2021(G)) of about 84 Lakh "Search for novel topological materials- A joint theoretical and experimental investigation" Role: Co-Investigator Status: ONGOING 5. SERB-TARE Research Grant (TAR/2018/000454) of 18.30 Lakh "Exploring magnetic, magnetocaloric and magnetoresistive properties of $Ti(Fe_{1-x}Co_x)_2$ ($0 \leq x \leq 1$)" Role: Principal Investigator Status: COMPLETED 6. UGC-DAE CSR-Collaborative Research Scheme (CRS/IC-256/2017-	

18/1337) of about 45,000 “Designing Heusler compounds for magnetic refrigeration and spintronics application
Role: Principal Investigator
Status: **COMPLETED**

Awards Received

1. Korea Research Fellowship-2019, (KRF. 2019H1D3A1A01102979)
2. Global Excellence Stature Fellowship at University of Johannesburg (UJ), South Africa, 2017.
3. Institute Postdoctoral Fellowship (IPDF) of IIT Bombay in 2015.
4. Best Oral Presentation Award in Research Scholar's Workshop on Physics of Materials at UGC-DAE CSR, Indore in 2013.
5. Qualifier to participate in Technical University Munich's Research
6. Opportunity Week (TUM-ROW) during November 11-15, 2013.
7. CSIR-Senior Research Fellow (CSIR-SRF) in 2013.
8. GATE (Graduate Aptitude Test in Engineering) 2009.
9. JEST (Joint Entrance Screening Test JEST) 2009.

Courses Handled at Under Graduate / Post Graduate Level.

Optics and Semiconductor Physics, Mechanics and Materials Science, Electromagnetic Theory and Quantum Mechanics, Engineering Physics, Applied Physics.



TM

No. of Papers Published

National Journals - --
National Conferences - 08

International Journals - 70
International Conferences 22

Invited Speaker

1. Delivered an expert talk 'Non-centrosymmetric cubic chiral magnets' at International Conference on Emergent Techniques and Functional Materials during 12-14 July 2022 at Medicaps University, Indore

No. of Books/Chapters Published with details

2. Large adiabatic temperature change in magnetoelastic transition in nanocrystalline of heusler Ni₅₀Mn₃₂Sn₁₈ alloys
A. Prasanna, S. Ram, V. Ganesan and S. S. Rao
Functional Materials McMillan Publishers Ltd. New Delhi ISBN 978-935-059046-1, p. 195 (2011)

Details of Short-Term Training /Faculty Development Programs Participated

1. One Week FDP on Present and future of Renewable Energy Sources: From Laboratory to Industry from 26-30th September, 2022
2. National Level One Week FDP on Recent Trends in Data Science for Engineering from 26-30th June 2023
3. One Week STTP on Recent Advancements in Medicinal Chemistry and Material Science from 24-28th April, 2023
4. One Week Online International FDP on Data Analyst from 19-20th June 2023
5. Online SPICE-SPIN+X Seminar "Iron garnet thin films for spintronic and photonic devices" by Prof. Dr. Caroline A. Ross (MIT) on Jan. 26, 2022.
6. 9th Annual Symposium of the Department of Physics, IIT Bombay on 11-12th December 2021.
7. National Level Faculty Development Program on "Radiation Effects on Polymers and Advances in Organic Optoelectronic Devices" from Feb. 02-03, 2022 by Vaagdevi Engineering College, Warangal, India
8. Online SPICE-SPIN+X Seminar on "Spins, Bits, and Flips: Essentials for High-Density Magnetic Random-Access Memory" by Tiffany Santos on Feb. 23, 2022 by JGU, Germany.
9. Faculty Development Program on "Recent Trends on Smart Materials and their Applications" from February 07-11, 2022 by Vardhaman College of Engineering, Hyderabad, India.
10. Participated in "Short Term Training Programming on Latex", from February 21-25, 2022 by Amity School of Engineering and Technology, Amity University Mumbai, India.
11. Online SPICE-SPIN+X Seminar on "Three dimensional spintronics: 'Faster, higher, stronger'" on February 02, 2022 by JGU, Germany
12. Virtual Workshop on February 04, 2022 by PETASPIN, IEEE Magnetism Society Italy Chapter.
13. Virtual Workshop on February 18, 2022 by PETASPIN, IEEE Magnetism Society Italy Chapter.
14. Two Day International Conference on "Advances in Smart Nano Materials organized by the Department of Physics, Govt. City College (Autonomous), Hyderabad from March 24-25, 2022.
15. Virtual workshop on "Topology in Magnetism and Ferroelectrics" on March 4, 2022 organized by PetaSpin Group, Germany.
16. Virtual workshop on "Scanning NV Magnetometry" on March 11, 2022 organized by PetaSpin Group, Germany.
17. One Week online Faculty Development Programme on "e-Teaching Learning and Ethical Values in Education" held from March 12-17, 2022 organized by Faculty of Science, Shri Rajiv Gandhi Government College, Banda, (Sagar), Madhya Pradesh.
18. Online SPICE-SPIN+X Seminar on "Ferrimagnetic Spintronics" by Kyung-Jin Lee (KAIST) on Mar. 16, 2022 by JGU, Germany.

19. One Week Short Term Training Programme through ICT Mode on "Fundamental and Applications of Nanomaterials" organized by NITTTR, Kolkata from March 21-25 2022.
20. Online SPICE-SPIN+X Seminar on "Ultrafast magnetization reversal driven by optical phonons" by Andrei Kirilyuk (Radboud University) on March 23, 2022, organized by JGU, Mainz, Germany.
21. One day workshop on Essential Education for Accelerating Creative Careers on 21.04.2022, organized by Elets Technomedia sponsored by Adobe Technologies.
22. Two day Faculty In-house Training Program on 23rd & 30th of April, 2022 by Internal Quality Assurance Cell (IQAC), CBIT, Hyderabad.
23. Online SPICE-SPIN+X Seminar on "Modeling of magneto-thermodynamics phenomena" by Oksana Chubykalo-Fesenko (CSIC) on May 4th, 2022
24. Online SPICE-SPIN+X Seminar on "Magnetic Chirality" by Sang-Wook Cheong (Rutgers University) on May 11, 2022
25. Online SPICE-SPIN+X Seminar on "Ferrimagnetic spintronics and self-torque" by Juan Carlos Rojas Sanchez (Institut Jean Lamour UL-CNRS) on May 18th, 2022

Teaching Experience 08 Years 11 Months

Research Experience 12 Years 10 Months

International/National Journals from 2017

1. Rajagiri, Prabhu, et al. "Uncovering the magnetism, universality class, magnetocaloric effect and ferromagnetic resonance of quenching-treated $\text{Co}_0.3\text{Zn}_{0.7}\text{Fe}_2\text{O}_4$." *Materials Chemistry and Physics* 345 (2025): 131176.
2. Samatham, S. Shanmukharao, et al. "Uncovering the magnetism, exchange correlation range and universality class of Ni substituted $\text{MnCo}_0.7\text{Fe}_{0.3}\text{Ge}$." *Materials Chemistry and Physics* (2025): 131193.
3. Rajagiri, Prabhu, et al. "Critical exponent study and magnetocaloric effect of $\text{Co}_{0.3}\text{Zn}_{0.7}\text{Fe}_2\text{O}_4$." *IEEE Transactions on Magnetics* (2025).
4. Reddy, S. Shravan Kumar, et al. "Exploring the Effect of La Substitution on Magnetic and Electrical Behavior of DyFeO_3 ." *Journal of Superconductivity and Novel Magnetism* 38.2 (2025): 131.
5. Babbadi, Gowrainedu, et al. "Phase Coexistence, Dual Transitions, Itinerant Magnetism, and Universal Critical Behavior of Ni-Substituted Mn (Co-Fe) Ge." *The Journal of Physical Chemistry C* 129.13 (2025): 6423-6431.
6. Samatham, S. Shanmukharao, et al. "Metamagnetism and TH phase diagrams of a kagome magnet ErMn_6Sn_6 ." *Journal of Alloys and Compounds* 1010 (2025): 177739.
7. Boya, Rajasekhar, et al. "Weak first-order phase transition, exchange bias effect, and T-H phase diagram of $\text{Mn}_{0.75}\text{Fe}_{0.25}\text{NiGe}$." *Physical Review Materials* 8.11 (2024): 114411.
8. Boya, Rajasekhar, E. Purushotham, and S. Shanmukharao Samatham. "Unfolding magnetic, electrical and universal magneto-resistance scaling behavior of $\text{Ni}_2\text{Mn}_{1-x}\text{Co}_x\text{In}$." *Results in Physics* 66 (2024): 108010.
9. Samatham, Satya Shanmukharao, et al. "Perturbation-tuned triple spiral metamagnetism and tricritical point in kagome metal ErMn_6Sn_6 ." *Communications Materials* 5.1 (2024): 113.
10. Kalabargi, Ravi Kumar, et al. "Gd substitution induced incommensurate antiferromagnetism in B20 noncentrosymmetric CoSi ." *Journal of Physics: Condensed Matter* 36.38 (2024): 385701.
11. Samatham, S. Shanmukharao, et al. "Relating Structural Sensitivities and Helical Magnetic Order of MnSi ." 2024 IEEE International Magnetic Conference-Short papers (INTERMAG Short papers). IEEE, 2024.
12. Samatham, S. Shanmukharao, et al. "Restoration of Magnetic Order in Heavy Metal Doped Spin Glass." 2024 IEEE International Magnetic Conference-Short papers (INTERMAG Short papers). IEEE, 2024.
13. Khandelwal, Parul, et al. "Spin-disorder intervened avoidance of quantum criticality in B20 cubic $\text{Mn}_{1-x}\text{V}_x\text{Si}$." *Journal of physics. Condensed Matter: an Institute of Physics Journal* (2024).
14. Samatham, S. Shanmukharao, et al. "Revealing magnetic and physical properties of TbFe_4Al_7 : 6: experiment and theory." *Journal of Physics: Condensed Matter* 36.20 (2024): 205802.
15. Samatham, S. Shanmukharao, et al. "Magnetic field-induced narrow first-order and metamagnetic phase transitions of Nd_5Ge_3 ." *AIP Advances* 14.2 (2024).
16. Impact of Tb substitution on structural, electrical and magnetic properties of $\text{Ho}_{1-x}\text{Tb}_x\text{FeO}_3$ orthoferrite Eadaiah Chatla, Nagendar Vankudothu, S. Shravan Kumar Reddy, S. Shanmukharao Samatham, M. Sreenath Reddy, Ch. Gopal Reddy, and P. Yadagiri Reddy *Applied Physics A* 130, 10 (2024) IF: 2.7

17. Spin-flop quasi metamagnetic, anisotropic magnetic, and electrical transport behavior of Ho substituted kagome magnet ErMn_6Sn_6
Jacob Casey, S. Shanmukharao Samatham, Christopher Burgio, Noah Kramer, Asraf Sawon, Jamaal Huff, and Arjun K. Pathak
Physical Review Materials 7, 074402 (2023) IF: 3.980
18. Substitution driven ground states of $\text{Fe}_{1-x}\text{Cr}_x\text{Si}$: A resistivity study
Sankararao Yadam, S. Shanmukharao Samatham, Raghavendra Kulkarni, D Venkateshwarlu and V Ganesan
Cryogenics 132, 103683, 2023 IF:2.134
19. Direct current magnetron sputtered Ni_3Al thin films with electron transport behaviour for superior electromagnetic shielding
Santhosh Kumar Adpa, S. Shanmukharao Samatham, Radhamaanohar Aepuru, Kalyani Date, Ravi Prakash Magisetty, Suwarna Datar, S. N. Kale, Rodrigo Espinoza Gonzalez, Vijaya Bhaskara Rao Bhaviripudi
Applied Physics A 129, 313 (2023) IF:2.983
20. Quantum Griffiths phase in disordered $\text{Mn}_{1-x}\text{Fe}_x\text{Si}$
Ashish Kumar Mishra, S. Shanmukharao Samatham, Mark T. F. Telling, A. D. Hillier, Martin R. Lees, K. G. Suresh and V. Ganesan
Phys. Rev. B (Letters) 107, L100405 (2023) IF: 3.908
21. FeRhCrSi : Spin semimetal with spin-valve behavior at room temperature
Y. Venkateswara, Jadupati Nag, S. Shanmukharao Samatham, Akhilesh Kumar Patel, P. D. Babu, Manoj Raama Varma, Jayita Nayak, K. G. Suresh, Aftab Alam
Phys. Rev. B (Letters) 107, L100401 (2023) Editors' Suggestion IF: 3.908
22. Unveiling the correlation between structural and magnetic ordering in nano $\text{Co}_{1-x}\text{Ni}_x\text{TeO}_4$
Akhilesh Kumar Patel, S. Shanmukharao Samatham, Ekta Rani, K. G. Suresh, Harishchandra Singh
Phys. Chem. Chem. Phys. (2022) Accepted IF: 3.945
23. Nearly compensated ferrimagnetic behaviour and giant exchange bias of hexagonal Mn_2PtAl : Experimental and theoretical study
Akhilesh Kumar Patel, S. Shanmukharao Samatham, Alexey V. Lukoyanov, P. D. Babu, and K. G. Suresh
Phys. Chem. Chem. Phys. 24, 29539 (2022) IF: 3.945
24. Magnetic behavior of Ru substituted skyrmion metal MnSi
S. Shanmukharao Samatham, Saurabh Singh, Akhilesh Kumar Patel, S. Shravan Kumar Reddy, Tsunehiro Takeuchi, and K. G. Suresh
J. Phys.: Condens. Matter 34, 345801 (2022) IF: 2.333
25. Experimental and theoretical investigations of Fe-Doped hexagonal MnNiGe
S. Shanmukharao Samatham, Akhilesh Kumar Patel, Ashish Kumar Mishra, Alexey V. Lukoyanov, Lyubov N. Gramateeva, Archana Lakhani, Ganesan V., and Suresh K. G.
ACS Omega 7, 18110 (2022) IF: 3.512
26. Electronic states structure of Gd_5Sb_3 and $\text{Gd}_5\text{Ge}_2\text{Sb}$ compounds according to band calculations and optical spectroscopy
Yu. V. Knyazev, A. V. Lukoyanov, Yu. I., Kuzmin, S. Shanmukharao Samatham, Akhilesh Kumar Patel, and K. G. Suresh
Physics of the Solid State 64, 305 (2022) IF: 0.99
27. Magnetism and transport behaviour of $\text{Ni}_{42}\text{Co}_8\text{Mn}_{38}\text{Sb}_{12}$: Magnetization, electrical resistivity and Hall effect measurements
Akhilesh Kumar Patel, S. Shanmukharao Samatham and K. G. Suresh
Materials Research Bulletin, 146, 111577, (2022) IF: 4.641
28. High-TC ferromagnetic inverse Heusler alloys: A comparative study of Fe_2RhSi and Fe_2RhGe
Y. Venkateswara, S. Shanmukharao Samatham, Akhilesh Kumar Patel, P. D. Babu, Manoj Raama Varma, K. G. Suresh, and Aftab Alam
Phys. Rev. B 104, 094402 (2021) IF: 3.836
29. Non-collinear antiferromagnetism to compensated ferrimagnetism in $\text{Ti}(\text{Fe}_{1-x}\text{Co}_x)_2$ ($x = 0, 0.5$ and 1) alloys: Experiment and Theory
S. Shanmukharao Samatham, Akhilesh Kumar Patel, A. V. Lukoyanov, K. G. Suresh and R. Nirmala
Physical Chemistry Chemical Physics 23, 5607 (2021) IF: 3.430
30. Unique structure induced magnetic and electrochemical activity in nanostructured transition metal tellurates $\text{Co}_{1-x}\text{Ni}_x\text{TeO}_4$ ($x = 0, 0.5$ and 1.0)
Akhilesh Kumar Patel, Manas Ranjan Panda, Ekta Rani, Harishchandra Singh, S. Shanmukharao Samatham, Abharana Nagendra, Sambhu Nath Jha, Dibyendu Bhattacharyya, Krishnawarrier G. Suresh, and Sagar Mitra
ACS Applied Energy Materials 3, 9436, (2020) IF: 4.473
31. Critical behavior, universality class and magneto-transport properties of Ni_2MnIn
Akhilesh Kumar Patel, S. Shanmukharao Samatham and K. G. Suresh
Mater. Res. Bull. 128, 110900 (2020) IF: 4.019
32. Disorder-induced critical exponents near a ferromagnetic quantum critical point in $\text{Mn}_{1-x}\text{Cr}_x\text{Si}$
Ashish Kumar Mishra, S. Shanmukharao Samatham, Martin R. Lees, and V. Ganesan
Phys. Rev. B 101, 144436 (2020) IF: 3.836

33. Coexistence of spin semimetal and Weyl semimetal behavior in FeRhCrGe
Y. Venkateswara, S. Shanmukharao Samatham, P. D. Babu, K. G. Suresh and Aftab Alam
Phys. Rev. B 100, 180404(R) (2019) IF: 3.836
34. Magnetism of 3d and 4d metal doped Mn_{0.7}Ti_{0.3}NiGe (T = Fe, Co, Ru and Rh): magnetization and ab-initio calculations
S. Shanmukharao Samatham, Akhilesh Kumar Patel, A. V. Lukoyanov, E. D. Baglasov and K. G. Suresh
J. Phys.: Condens. Matter 31, 495804 (2019) IF: 2.711
35. Magnetism and electronic structure of Gd₅Ge₂Sb: Experiment and Theory
S. Shanmukharao Samatham, Akhilesh Kumar Patel, Alexey V. Lukoyanov and K. G. Suresh
J. Alloys Comp. 806, 575 (2019) IF: 4.175
36. Revelation of spin glass behaviour of Ru doped MnNiGe: Experiment and Theory
S. Shanmukharao Samatham, Akhilesh Kumar Patel, A. V. Lukoyanov and K. G. Suresh
J. Phys.: Condens. Matter 31, 125803 (2019) IF: 2.711
37. Effect of Ru substitution on structural, magnetic and transport behaviour of Ni₅₀Mn₃₈Sb₁₂
Akhilesh Kumar Patel, S. Shanmukharao Samatham, A. K. Yadav, S. N. Jha, D. Bhattacharyya and K. G. Suresh
J. Alloys Comp. 783, 977 (2019) IF: 4.175
38. Magnetization, resistivity, specific heat and ab initio calculations of Gd₅Sb₃
S. Shanmukharao Samatham, Akhilesh Kumar Patel, A. V. Lukoyanov and K. G. Suresh
J. Phys.: Condens. Matter 30, 295802 (2018) IF: 2.711
39. Critical exponents and universal magnetic behavior of noncentrosymmetric Fe_{0.6}Co_{0.4}Si
S. Shanmukharao Samatham and K. G. Suresh
J. Phys.: Condens. Matter 30, 215802 (2018) IF: 2.711
40. Quantum phase transition and non-Fermi liquid behaviour in Fe_{1-x}CoxSi (x ≥ 0.7)
S. Shanmukharao Samatham, K. G. Suresh and V. Ganesan
J. Phys.: Condens. Matter 30, 145602 (2018) IF: 2.711
41. Competing magnetic and spin gap-less semiconducting behaviour in fully compensated ferrimagnet CrVTiAl: Theory and Experiment
Y. Venkateswara, Sachin Gupta, S. Shanmukharao Samatham, Manoj Raama Varma, K. G. Suresh, Aftab Alam
Phys. Rev. B 97, 054407 (2018) IF: 3.836
42. Spin fluctuations in Cr doped MnSi
Ashish Mishra, Krishnan M, Durgesh Singh, S. Shanmukharao Samatham, M Gangrade, R Venkatesh and V Ganesan
J. Magn. Magn. Mater. 448, 130 (2018) IF: 3.046
43. Critical behavior, universal magnetocaloric and magnetoresistance scaling of MnSi
S. Shanmukharao Samatham and V. Ganesan
Phys. Rev. B 95, 115118 (2017) IF: 3.836
44. Quantum size effect on the heat capacity of nickel nanolattice
J. Singh, Tarachand, S. S. Samatham, D. Venkateshwarlu, Netram Kaurav, V. Ganesan, and G. S. Okram
Appl. Phys. Lett. 111, 201904 (2017) IF: 3.521
45. Spin-flop quasi-first order phase transition and putative tricritical point in Gd₃Co
S. Shanmukharao Samatham, Soumendu Barua and K. G. Suresh
J. Magn. Magn. Mater. 444, 439 (2017) IF: 3.046
46. Anomalous magneto-transport properties of Bi doped La_{0.67}Sr_{0.33}MnO₃
S. Angappane, Nagaiah Kambhala, S. Shanmukharao Samatham, R. Venkatesh, V. Ganesan
Phys. Status Solidi B 255, 1700194 (2017) IF: 1.674
47. Weak arrest-like and field-driven first order magnetic phase transitions of itinerant Fe₃Ga₄ revealed by magnetization and magnetoresistance isotherms
S. Shanmukharao Samatham and K. G. Suresh
J. Magn. Magn. Mater. 422, 174 (2017) IF: 3.046
48. Low temperature transport anomaly in Cr substituted (La_{0.67}Sr_{0.33})MnO₃ manganites
Tejas M. Tank, Vilas Shelke, Sarmistha Das, D. S. Rana, C. M. Thaker, S. S. Samatham, V. Ganesan and S.P. Sanyal
J. Magn. Magn. Mater. 432, 581 (2017) IF: 3.046