



TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO

ID CODE 5949

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Fisica Aldo Pontremoli**

Scientist- in - charge: **Prof. Fratesi Guido**

[Name and surname]

## CURRICULUM VITAE

### PERSONAL INFORMATION

Surname	GHOSH
Name	SAYANDEEP

### PRESENT OCCUPATION

Appointment	Structure
Post Doctoral Researcher	Department of Physics, Chungnam National University, Daejeon and Kunsan National University, Gunsan, Republic of Korea

### EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree			
Specialization			
PhD	Condensed Matter Physics	Indian Institute of Technology Guwahati	2021
Master	Physics	Visva Bharati University	2014
Degree of medical specialization			
Degree of European specialization			
Other			



## REGISTRATION IN PROFESSIONAL ASSOCIATIONS

Date registration	of	Association	City

## FOREIGN LANGUAGES

Languages	level of knowledge
English, Hindi, Bengali	good

## AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2018 - 2021	Senior Research Fellow (SRF) - GATE fellowship (MHRD, India)
2016 - 2018	Junior Research Fellow (SRF) - GATE fellowship (MHRD, India)
2016	Qualified in Graduate Aptitude Test in Engineering (GATE)
2016	Qualified in Joint Entrance Screening Test (JEST)
2012	Ranked 3rd in B.Sc. Physics, Visva-Bharati University

## TRAINING OR RESEARCH ACTIVITY

description of activity: At present, I am working on kagome systems like AV<sub>3</sub>Sb<sub>5</sub> (A=K, Cs, Rb) and study the nature of electronic correlations in the presence of on-site (U) and inter-site (V) Coloumb potential using the DFT+U+V calculations. Since these systems exhibit the Charge Density Wave (CDW), my study involves different CDW deformation to understand the superconductivity properties of these materials. Along with the electronic structure (band dispersion, density of states), my study is also focused on the dynamics properties of these Kagome systems, pressure-dependent studies, and other physical properties. Alongside, I also deal with structure-property in correlations of magnetic (exchange interactions) and electronic properties of spinel/perovskite oxides and columbites. Recently, I have started working on 2D materials in collaboration with experimental groups.

## PROJECT ACTIVITY

Year	Project

## PATENTS

Patent



## CONGRESSES AND SEMINARS

Date	Title	Place
August 17 - 19, 2022	Attended	BSPCS-APCTP International Workshop Computational Approaches to Magnetic Systems (CAMS-2022), Institute for Basic Science (IBS) in Daejeon, Republic of Korea
February 4-6, 2020	Magnetic Exchange Bias and Spin-glass state in Cobalt orthoruthanate	ational Conference on Progresses in Material Science Research (PMSR-2020), Dibrugarh University, India
November 29-December 1, 2019	First-Principle Density Functional Theory (DFT) study of Ge diluted Cobalt orthotitanate	International Conference on Nanoscience and Nanotechnology (ICNAN-2019), Vellore Institute of Technology, Vellore, India.
December 17-20, 2018	Density Functional Theory Studies of Mg doped NiO	International Conference on Nano-structured Materials & Devices (ICNSMD-2018), University of Delhi, New Delhi, India
1-3 March, 2018	Density Functional Theory Studies of Co-based Spinel	International Conference on Systems and Processes in Physics, Chemistry and Biology (ICSPPCB- 2018), , Silchar, Assam, India
December 18-21, 2017	Structural and Magnetic properties of Cobalt Aluminate	International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2017), IIT Guwahati, Assam, India
December 4-8, 2017	Attended	Winter School-2017 on frontiers in materials science, JNCASR, Bengaluru, India
January 29 -February 2, 2018	Attended	Sorbonne-JNCASR School for Advanced Computational Material Science (SJSACMS-2018), JNCASR, Bengaluru, India

## PUBLICATIONS

Articles in reviews
“Reentrant Canonical Spin-Glass Dynamics and Tunable Field-Induced Transitions in (GeMn)Co <sub>2</sub> O <sub>4</sub> Kagome lattice”, A. D. Singha, P. Pramanik, D. C. Joshi, <u>S. Ghosh</u> , S. K. Jena, P. Tiwari, T. Sarkar, S. Thota, <a href="#">Journal of Physics: Condensed Matter</a> (Accepted). (IOP)
“Boron doped g-C <sub>3</sub> N <sub>4</sub> quantum dots based highly sensitive surface acoustic wave NO <sub>2</sub> sensor with faster gas kinetics under UV light illumination”, K. S. Pasupuleti, <u>S. Ghosh</u> , N. Jayababu, C. J. Kang, H. D. Cho, S. G. Kim, M. D. Kim, <a href="#">Sensors and Actuators B: Chemical</a> 378, 133140 (2023). (Elsevier)
“Unraveling the nature of ferrimagnetism and associated exchange interactions in distorted honeycomb Ni <sub>4</sub> Nb <sub>2</sub> O <sub>9</sub> ”, S. Thota, M. S. Seehra, M. R. Chowdhury, H. Singh, <u>S. Ghosh</u> , S. K. Jena, P. Pramanik, T. Sarkar, R. S. Rawat, R. Medwal, and B. Weise, <a href="#">Phys. Rev. B</a> 106, 134418 (2022). (APS)
“Antiferromagnetic short-range order and cluster spin-glass state in diluted spinel ZnTiCoO <sub>4</sub> ”, M. R. Chowdhury, M. S. Seehra, P. Pramanik, <u>S. Ghosh</u> , T. Sarkar, B. Weise, S. Thota, <a href="#">J. Phys.: Condens. Matter</a> 34, 275803 (2022). (IOP)
“Anisotropic Ferromagnetic Organic Nanoflowers”, S. Sasidharan, <u>S. Ghosh</u> , R. Sreedhar, K. Kumari, S. Thota, V. Ramakrishnan, <a href="#">J. Phys. Chem. C</a> 126, 8511 (2022). (ACS)
“Substrate orientation dependent characteristics of half-metallic and metallic superlattices [La <sub>0.7</sub> Sr <sub>0.3</sub> MnO <sub>3</sub> /LaNiO <sub>3</sub> ] <sub>10</sub> ”, S. Das, R. G. Tanguturi, <u>S. Ghosh</u> , R. K. Dokala, R. Medwal, S. Gupta, Z. Yan, Y. Qi, R. S.



Rawat, S. Thota, <a href="#">Journal of Applied Physics</a> 131, 125305 (2022). (AIP)
“Determination of the tricritical point, H-T phase diagram and exchange interactions in the antiferromagnet $MnTa_2O_6$ ”, Maruthi R., M. S. Seehra, <a href="#">S. Ghosh</a> , R. Medwal, R. S. Rawat, B. Weise, E. S. Choi and S. Thota, <a href="#">J. Phys.: Condens. Matter</a> 34, 155801 (2022). (IOP)
“Tailoring the electronic structure and magnetic properties of pyrochlore $Co_2Ti_{1-x}Ge_xO_4$ : A GGA+U ab initio study”, <a href="#">S. Ghosh</a> , S. Singh, D. Das, S. Ghosh, P. K. Mishra, T. Sarkar, and S. Thota, <a href="#">J. Phys.: Condens. Matter</a> 33, 145504 (2021). (IOP)
“Magnetic ground state and exchange interactions in the Ising chain ferromagnet $CoNb_2O_6$ ”, S. Thota, <a href="#">S. Ghosh</a> , Maruthi R, D. C. Joshi, R. Medwal, R. S. Rawat, and M. S. Seehra, <a href="#">Phys. Rev. B</a> 103, 064415 (2021). (APS)
“Lattice dynamics and magnetic exchange interactions in $GeCo_2O_4$ : A spinel with $S=1/2$ pyrochlore lattice”, P. Pramanik, S. Singh, M. R. Chowdhury, <a href="#">S. Ghosh</a> , V. Sathe, K. M. Rabe, D. Vanderbilt, M. S. Seehra, and S. Thota, <a href="#">Phys. Rev. B</a> 104, 014433 (2021). (APS)
“Magnetic field-temperature phase diagram, exchange constants and specific heat exponents of the antiferromagnet $MnNb_2O_6$ ”, Maruthi R. , <a href="#">S. Ghosh</a> , M. S. Seehra, D. C. Joshi, M. R. Chowdhury, R. Medwal, R. S. Rawat, B. Weise and S. Thota, <a href="#">J. Phys.: Condens. Matter</a> 33, 345801 (2021). (IOP)
“The role of epitaxial strain on the electronic and magnetic structure of $La_{0.7}Sr_{0.3}MnO_3/LaCoO_3$ bilayers”, S. Das, <a href="#">S. Ghosh</a> , R. G. Tanguturi, R. Medwal, S. Gupta, R. K. Dokala, R. S. Rawat, S. Das, S. Thota, <a href="#">AIP Advances</a> 11, 125115 (2021). (AIP)
“Dynamical response of localized electron hopping and dipole relaxation in $Cu_{1-x}Zn_xFe_2O_4$ magnetoceramics”, S. K. Jena, D. C. Joshi, <a href="#">S. Ghosh</a> , K. Dasari, and S. Thota, <a href="#">J. Phys. D: Appl. Phys.</a> 54, 425303 (2021). (IOP)
“Identification of a Fe-Dependent Optical Mode in $CuAl_{1-x}Fe_xO_2$ ”, M. Aziziha, S. Akbarshahi, S. Pittala, <a href="#">S. Ghosh</a> , R. Sooriyagoda, A. H. Romero, S. Thota, A. D. Bristow, M. S. Seehra, and M. B. Johnson, <a href="#">J. Phys. Chem. C</a> 125, 3577 (2021). (ACS)
“Antiferromagnetism, spin-glass state, H-T phase diagram, and inverse magneto-caloric effect in $Co_2RuO_4$ ”, <a href="#">S. Ghosh</a> , D. C. Joshi, P. Pramanik, S. K. Jena, S. Pittala, T. Sarkar, M. S. Seehra, and S. Thota, <a href="#">J. Phys.: Condens. Matter</a> 32, 485806 (2020). (IOP)
“Electronic structure and magnetic exchange interactions in Zn diluted $CuFe_2O_4$ magnetoceramics”, S. K. Jena, D. C. Joshi, Z. Yan, Y. Qi, <a href="#">S. Ghosh</a> , and S. Thota, <a href="#">J. Appl. Phys.</a> 128, 073908 (2020). (AIP)
“Elastic strain control of electronic structure, and magnetic properties of $[Pr_{1-x}Ca_xMnO_3/SrTiO_3]_{15}$ superlattices”, R. K. Dokala, S. Das, D. C. Joshi, <a href="#">S. Ghosh</a> , Z. Yan, Y. Qi, S. Das, and S. Thota, <a href="#">J. Appl. Phys.</a> 127, 175303 (2020). (AIP)
“Low-temperature anomalous spin correlations and Kondo effect in ferromagnetic $SrRuO_3/LaNiO_3/La_{0.7}Sr_{0.3}MnO_3$ trilayers”, <a href="#">S. Ghosh</a> , R. G. Tanguturi, P. Pramanik, D. C. Joshi, P. K. Mishra, S. Das, and S. Thota, <a href="#">Phys. Rev. B</a> 99, 115135 (2019). (APS)
“Magnetic exchange interactions and band gap bowing in $Ni_xMg_{1-x}O$ ( $0.0 \leq x \leq 1.0$ ): A GGA+U density functional study”, <a href="#">S. Ghosh</a> , S. K. Jena, P. K. Mishra, M. S. Seehra, and S. Thota, <a href="#">J. Appl. Phys.</a> 126, 233904 (2019). (AIP)
“Magnetic ground state, field-induced transitions, electronic structure, and optical band gap of the frustrated antiferromagnet $GeCo_2O_4$ ”, P. Pramanik, <a href="#">S. Ghosh</a> , P. Yanda, D. C. Joshi, S. Pittala, A. Sundaresan, P. K. Mishra, S. Thota, and M. S. Seehra, <a href="#">Phys. Rev. B</a> 99, 134422 (2019). (APS)
“Phonon Dynamics in Anisotropic Dilute $CuAl_{1-x}Fe_xO_2$ Delafossite Alloys by a Weighted Dynamical Matrix Approach”, M. Aziziha, S. Akbarshahi, <a href="#">S. Ghosh</a> , P. Pramanik, J. P. Lewis, A. H. Romero, S. Thota, M. S. Seehra, and M. B. Johnson, <a href="#">J. Phys. Chem. C</a> 123, 30604 (2019). (ACS)
“Role of phase transition in the dielectric and magnetic properties of Na containing $NiO$ ”, D. C. Joshi, P. Pramanik, M. K. Warshi, <a href="#">S. Ghosh</a> , A. Meher, K. Dasari, and S. Thota, <a href="#">J. Phys. Chem. Solids</a> 130, 154 (2019). (Elsevier)



“Role of dilution on the electronic structure and magnetic ordering of spinel cobaltites”, <u>S. Ghosh</u> , S. Singh, D. C. Joshi, P. Pramanik, S. Ghosh, P. K. Mishra, and S. Thota, <a href="#">Phys. Rev. B</a> 98, 235119 (2018). (APS)
“Interfacial magnetism in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{LaNiO}_3$ ultrathin superlattices”, S. Das, <u>S. Ghosh</u> , P. Pramanik, D. C. Joshi, and S. Thota, <a href="#">J. Phys. D: Appl. Phys.</a> 51, 325001 (2018). (IOP)
“Effect of NiO substitution on the structural and dielectric behaviour of $\text{NaNbO}_3$ ”, R. T. George, D. C. Joshi, S. Nayak, N. Tiwari, R. N. Chauhan, P. Pramanik, T. A. Dar, <u>S. Ghosh</u> , and S. Thota, <a href="#">J. Appl. Phys.</a> 123, 054101 (2018). (AIP)
“Finite-size scaling and exchange-bias in $\text{SrRuO}_3/\text{LaNiO}_3/\text{SrRuO}_3$ trilayers”, S. Thota, <u>S. Ghosh</u> , S. Nayak, D. C. Joshi, P. Pramanik, K. Roychowdhury, and S. Das, <a href="#">J. Appl. Phys.</a> 122, 124304 (2017). (AIP)
“Neutron diffraction study of the inverse spinels $\text{Co}_2\text{TiO}_4$ and $\text{Co}_2\text{SnO}_4$ ”, S. Thota, M. Reehuis, A. Maljuk, A. Hoser, J. -U. Hoffmann, B. Weise, A. Waske, M. Krautz, D. C. Joshi, S. Nayak, <u>S. Ghosh</u> , P. Suresh, K. Dasari, S. Wurmehl, O. Prokhnenko, and B. Buchner, <a href="#">Phys. Rev. B</a> 96, 144104 (2017). (APS)

#### OTHER INFORMATION

Manuscript under process
“Effects of Inter-site Coulomb Interactions in the Kagome Superconductor $\text{KV}_3\text{Sb}_5$ : A first-principles DFT+U+V study”, <u>S. Ghosh</u> , B. Kim, and C.J. Kang.
“Mapping the Field Induced Transitions On H-T Plane and the Evaluation of Exchange Interactions in Triangular Spin-1 Antiferromagnet $\text{NiNb}_2\text{O}_6$ ”, Maruthi R, S. Singh, <u>S. Ghosh</u> , B. Weise, M. S. Seehra, and S. Thota, <a href="#">Phys. Rev. B</a> under review.
“Phonon Dynamics and Dielectric Relaxation in Distorted Honeycomb Ferrimagnet $\text{Ni}_4\text{Nb}_2\text{O}_9$ ”, H. Singh, S. Singh, <u>S. Ghosh</u> , P. Pramanik, V. Sathe, R. Mathieu, and S. Thota, <a href="#">Phys. Rev. B</a> under review.

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

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