

# Sukanya GHOSH

## PERSONAL DATA

PLACE AND DATE OF BIRTH: Kolkata, India — 23 November 1988  
EMAIL: [ghosh.sukanya1989@gmail.com](mailto:ghosh.sukanya1989@gmail.com), [sghosh@ed.ac.uk](mailto:sghosh@ed.ac.uk)

## EDUCATION

2012 - 2018 **Ph.D. in Computational Materials Science**  
**Jawaharlal Nehru Centre for Advanced Scientific Research**, Bangalore, India  
Research Dissertation: “*Density Functional Theory and Descriptor-Based Strategies for Tailoring the Properties of Nanomaterials*”  
— Advisor: Prof. Shobhana NARASIMHAN

2010 - 2012 **M.Sc. in Physics**  
**Indian Institute of Technology, Delhi**, Delhi, India  
Thesis: “*Study of Quantum Entanglement in Cavity-Optomechanical System*”  
— Advisor: Prof. Dilip RANGANATHAN  
CGPA: 8.50/10.00

2007 - 2010 **B.Sc. in Physics**  
**Bethune College, University of Calcutta**, Kolkata, India  
PERCENTAGE: 68.8% (1st class)

## RESEARCH EXPERIENCE

July 2018 - August 2021 **Postdoctoral Fellow at Abdus Salam International Centre for Theoretical Physics**, Trieste, Italy  
— Advisor: Prof. Nadia BINGGELI  
— Theoretical and computational studies of 2D magnetic materials.

September 2021 - April 2023 **Postdoctoral Fellow at Uppsala University**, Uppsala, Sweden  
— Advisor: Prof. Biplab SANYAL  
— Investigation of novel quantum states in two-dimensional (2D) magnets and their heterostructures

April 2023 - August 2023 **Research Associate at University of Edinburgh**, Edinburgh, UK  
— Advisor: Prof. Elton SANTOS  
— Atomistic/Micromagnetic Simulations of Advanced Magnetic Compounds

August 2022 - Present **Visiting Researcher at Bose Institute**, Kolkata, India  
— Host: Prof. Achintya SINGHA

## LIST OF PUBLICATIONS

1

1. [S. Ghosh](#), S. Ershadrad and B. Sanyal, “**Structural distortion and dynamical electron correlation driven enhanced ferromagnetism in Ni-doped two-dimensional Fe<sub>5</sub>GeTe<sub>2</sub> beyond room temperature**”, *2D Materials* **11** 035002, 2024. IF: **5.5**.
2. C.A. Brondin, [S. Ghosh](#), S. Debnath, F. Genuzio et al, “**Tailoring magnetic anisotropy in ultrathin cobalt by surface carbon chemistry**”, *Advanced Electronic Materials* 2300579, 2024. IF: **7.633**.
3. C. Nayak, S. Masanta, [S. Ghosh](#), S. Moulick, A. Pal, I. Bose and A. Singha, “**Valley polarization and photocurrent generation in transition metal dichalcogenide alloy MoS<sub>2x</sub>Se<sub>2(1-x)</sub>**”, *Physical Review B*, **109**, 115304. 2024. IF: **4.904**
4. E Sasioglu, M Tas, S Ghosh, W Beida, B Sanyal, S Blugel, I Mertig, I Galanakis, “**Spin-gapped metals: A novel class of materials – the case of semi-Heusler compounds**”, *arXiv*: 2403.00936, 2024.

<sup>1</sup>\*authors contributed equally

5. S. Ghosh, S. Ershadrad, V. Borisov and B. Sanyal, “**Unraveling effects of electron correlation in 2D  $\text{Fe}_n\text{GeTe}_2$  ( $n=3, 4, 5$ ) by dynamical mean field theory**”, *npj Computational Materials* **9**, 1, 86, 2023. IF: **12.3**
6. B. Zhao, R. Ngalyo, S. Ghosh, S. Ershadrad, R. Gupta, K. Ali, Md. Hoque, B. Karpiak, D. Khokhriakov, C. Polley, T. Balasubramanian, A. Kalaboukhov, P. Svedlindh, B. Sanyal and S. Dash, “**Room Temperature Spin-Valve with van der Waals Ferromagnet/Graphene Heterostructure**”, *Advanced Materials* **35**, 2209113, 2023. IF: **32.086**
7. S. Khan, E. S. Y. Aw, L. A. V. Nagle-Cocco, A. Sud, S. Ghosh, M. K. B. Subhan et al, “**Spin-glass states generated in van der Waals magnet  $\text{Cr}_2\text{Ge}_2\text{Te}_6$  by alkali-ion intercalation**”, *arXiv*: :2312.17554, 2023.
8. S. Ghosh, N. Stojić and N. Binggeli, “**Rashba-induced spin texture and spin-layer-locking effects in antiferromagnetic  $\text{CrI}_3$  bilayer**”, *Journal of Physics and Chemistry of Solids* **173**, 111100, 2023. IF: **4.383**
9. E. Gürbüz, S. Ghosh, E. Sasioglu, I. Galanakis, I. Mertig, and B. Sanyal, “**Spin-polarized two-dimensional electron gas at the interface of non-magnetic semiconducting half-Heusler compounds: Modified Slater-Pauling rule for half-metallicity at the interface**” *Physical Review Materials* **7**, 054405 2023. IF: **3.98**
10. S. Ershadrad\*, S. Ghosh\*, D. Wang, Y. Kvashnin and B. Sanyal, “**Unusual Magnetic Features in Two-Dimensional  $\text{Fe}_5\text{GeTe}_2$  Induced by Structural Reconstructions**”, *Journal of Physical Chemistry Letters* **13**, 4877 - 4883, 2022. Impact Factor (IF): **6.888**
11. S. Ghosh, N. Stojić and N. Binggeli, “**Overcoming the asymmetry of the electron and hole doping for magnetic transitions in bilayer  $\text{CrI}_3$** ”, *Nanoscale* **13**, 9391 - 9401, 2021. IF: **8.307**
12. S. Ghosh, N. Stojić and N. Binggeli, “**Comment on “Magnetic Skyrmions in Atomic Thin  $\text{CrI}_3$  Monolayer” [Appl. Phys. Lett. 114, 232402 (2019)]**”, *Applied Physics Letters* **116**, 086101, 2020. IF: **3.971**
13. S. Ghosh, N. Mammen and S. Narasimhan, “**Support Work Function as a Descriptor and Predictor for the Charge and Morphology of Deposited Au Nanoparticles**”, *Journal of Chemical Physics* **152**, 144704 - 16, 2020. IF: **3.608**
14. S. Ghosh, N. Mammen and S. Narasimhan, “**Descriptor for the Efficacy of Aliovalent Doping of Oxides and its Application for the Charging of Supported Au Clusters**”, *The Journal of Physical Chemistry C* **123**, 32, 19794 - 19805, 2019. IF: **4.177**
15. S. Ghosh, N. Stojić and N. Binggeli, “**Structural and Magnetic Response of  $\text{CrI}_3$  Monolayer to Electric Field**”, *Physica B: Condensed Matter* **570**, 166 - 171, 2019. IF: **2.988**
16. V. D. Pham\*, S. Ghosh\*, F. Joucken, M. Pelaez, C. Chacon, V. Repain, A. Bellec, Y. Girard, S. Rousset, Y. Dappe, S. Narasimhan and J. Lagoute. “**Selective Control of Molecule Charge State on Graphene Using Tip-induced Electric Field and Nitrogen Doping**”, *npj 2D Materials and Applications* (nature publishing group) **3**, 5, 2019. IF: **12.043**
17. P. Zalake\*, S. Ghosh\*, S. Narasimhan and K. George Thomas, “**Descriptor-Based Rational Design of Two-Dimensional Self-Assembled Nano-Architectures Stabilized by Hydrogen Bonds**”, *Chemistry of Materials* **29**, 17, 7170 - 7182, 2017. (Cover Page article, September 2017). IF: **10.508**

## ACADEMIC AWARDS AND ACHIEVEMENTS

- 
- Carl Tryggers Stiftelse fellowship to pursue research as a postdoc in Uppsala University, September 2021 to August 2023.
  - Postdoctoral fellowship from International Centre for Theoretical Physics (ICTP), Trieste, Italy, July 2018 to August 2021.

- Received best poster award for poster presented at the ‘Annual In-House Symposium’ held at JNCASR, Bangalore, India, 5 - 6 January, 2015.
- Received best poster award at ‘International Union of Material Research Society, International Conference in Asia - 2013’ (IUMRS-ICA 2013) held at Indian Institute of Science, Bangalore, India, December 16 - 20, 2013.
- **Joint Enetrance Screening Test (JEST) 2012:** All India Rank (AIR) 52
- **The Graduate Aptitude Test in Engineering (GATE) 2012:** AIR 179
- **CSIR-UGC NET 2011:** AIR 62 (Lecturership)
- **Merit-cum-Means Fellowship: IIT Delhi 2011-2012**
- **IIT Joint Admission in M.Sc. (JAM) 2010:**, AIR 121

## COMPUTER SKILLS

---

|                           |                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------|
| Quantum Mechanical Codes: | QUANTUM ESPRESSO, RSPt, UppASD, SIESTA, VASP, GAUSSIAN90, WANNIER90, WANNIERTOOLS, Yambo, FLEUR |
| Operating Systems:        | LINUX, WINDOWS                                                                                  |
| Languages:                | Python, FORTRAN (F90), C++, L <sup>A</sup> T <sub>E</sub> X, scripting with ‘awk’ commands      |
| Software Tools:           | GNU-plot, Xmgrace, MATLAB, Xcrysden, VESTA, Gauss View                                          |

## TEACHING EXPERIENCE

---

- Assistant Professor: Department of Physics, Central University of Kashmir, Gandeбал, Jammu and Kashmir, India, April 2023 - Present.
- Assistant Professor (Probation Period): Vellore Institute of Technology, Bhopal, India, September 2023 - December 2023.
- Assistant teacher for the course of ‘Computational Modelling of Energy Related Materials’, Uppsala University, Sweden, October 2021 - December 2021, October 2022 - December 2022.
- Teaching Assistant in ‘MaX School on Advanced Materials and Molecular Modelling with Quantum ESPRESSO’, in International Centre for Theoretical Physics (ICTP), Italy, May 2021.
- Teaching Assistant for the course ‘Selected topics in condensed matter physics’, in International Centre for Theoretical Physics (ICTP), Italy, October 2019 - May 2020, October 2020 - May 2021.
- Project Supervisor for Summer Intern, Mr. Riyaz Ahmed: “Structural and Electronic Properties of F4-TCNQ Molecule on Pristine and Nitrogen-doped Graphene”, Theoretical Sciences Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India, May - July 2016.
- Tutor at the ‘School on computational materials modeling in catalysis’ held in JNCASR, Bangalore, India, September 1 - 5, 2014.
- Teaching Assistant for the course ‘JT 201: Solid State Physics’, Theoretical Sciences Unit, JNCASR, Bangalore, India, January - April 2014.

## SPONSORED RESERACH PROJECT

---

- Funding agency: CEFIPRA
- Project title: Magnetism of self-organized structures at surfaces
- Project duration: 1.7.2015 to 30.6.2018
- Budget: ~15 Lakh INR

- Project outcome: V. D. Pham\*, S. Ghosh\*, F. Joucken, M. Pelaez, C. Chacon, V. Repain, A. Bellec, Y. Girard, S. Rousset, Y. Dappe, S. Narasimhan and J. Lagoute. **“Selective Control of Molecule Charge State on Graphene Using Tip-induced Electric Field and Nitrogen Doping”**, *npj 2D Materials and Applications* (nature publishing group) **3**, 5, 2019. IF: **12.043**

## SELECTED CONFERENCES/WORKSHOPS/SCHOOLS ATTENDED

---

- ‘DPG Spring Meeting’, Technical University of Dresden, Germany, March 28 - 30, 2023.
- ‘Psi-k conference’, École polytechnique fédérale de Lausanne, Switzerland, August 22 - 25, 2022.
- ‘Wannier 2022 Summer School’, International Centre for Theoretical Physics (ICTP), May 16 -20, 2022.
- ‘7th BerkeleyGW Tutorial Workshop and 2nd Berkeley Excited States Conference (BESC2021)’, online Conference and Tutorial Workshop. January 4 - 8, 2021.
- ‘Conference On Advances in Catalysis, Energy, And Environmental Research Online Meet’, organized by Tata Institute of Fundamental Research (TIFR) Hyderabad. December 16 - 18, 2020.
- ‘Annual In-House Symposium’, JNCASR, Bangalore, India. November 13 - 14, 2017. (Oral presentation)
- ‘Indo-French Seminar on Women in Science’, Indian Institute of Science, Bangalore, India. February 3 - 5, 2015. (Poster presentation)
- ‘17th International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods’, ICTP, Trieste, Italy. January 15 - 17, 2015. (Poster presentation)
- ‘Annual In-House Symposium’, JNCASR, Bangalore, India. January 5 - 6, 2015. (Poster presentation)
- ‘Tenth JNC Research Conference On Chemistry Of Materials’, Thiruvananthapuram, India. October 11 - 13, 2014. (Poster presentation)
- ‘From the Chemical Bond to the Chemical Plant: Computational and Materials Challenges in Gas Conversion Technologies’, JNCASR, Bangalore, India. August 25 - 28, 2014. (Poster presentation)
- ‘Materials Simulations Theory And Numerics Summer School’ (MASTANI), IISER Pune, India. June 30 - July 12, 2014. (Poster Presentation)
- ‘International Union of Material Research Society, International Conference in Asia - 2013’ (IUMRS-ICA 2013), December 2013. (Poster presentation)
- ‘Kathmandu Summer School on *ab initio* Simulation of Solids’ held in Tribhuvan University, Kathmandu, Nepal. April 14 - 20, 2013.

## RECENT TALKS AS GUEST OR INVITED SPEAKER

---

- ‘Unveiling Exotic Magnetic Phenomena in Two-Dimension: from metals to semiconductors’, January 23, 2023, Indian Institute of Technology Bhubaneswar, India.
- ‘Unraveling Exotic Magnetic Phenomena in Two-Dimension’, August 4, 2022, Department of Physics, Indian Institute of Technology Kharagpur, India.
- ‘Unraveling Exotic Magnetic Phenomena in Two-Dimension’, August 3, 2022, Saha Institute of Nuclear Physics, Kolkata, India.
- ‘Unraveling Exotic Magnetic Phenomena in Two-Dimension’, August 2, 2022, Department of Physics, Presidency University, Kolkata, India.

- ‘Unraveling Exotic Magnetic Phenomena in Two-Dimension’, August 1, 2022, Department of Physics, Adamas University, Kolkata, India.
- ‘Unraveling Exotic Magnetic Phenomena in Two-Dimension’, July 27, 2022, Department of Physics, Bose Institute, Kolkata, India.
- ‘Unraveling Exotic Magnetic Phenomena in Two-Dimension’, July 21, 2022, Department of Physics, Indian Statistical Institute, Kolkata, India.