

Faculty Profile

1. Name: Bikash Chandra Gupta
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 - (i) Google Scholar: <https://scholar.google.com/citations?user=a3ouivcAAAAJ&hl=en>
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8. Publication Summary:
 - (a) No. of Research papers - 67
 - (b) h-index - 14
 - (c) i-10 index - 23
9. Date of Joining Visva-Bharati Service: September 11, 2005
10. Education:

Degree	Year	University/Institution
Ph. D.	1999	Institute of Physics / Utkal University
M. Sc.	1992	Visva-Bharati
B. Sc.	1988	St. Xavier's College / Calcutta University

11. Academic Positions held (in reverse chronological order)

Sl. No.	Positions held	Institution	Period
1.	Professor	Visva-Bharati	2016 onward
2.	Associate Professor	Visva-Bharati	2013 - 2016
3.	Reader	Visva-Bharati	2010 - 2013
4.	Sr. Lecturer	Visva-Bharati	2009 - 2010
5.	Lecturer	Visva-Bharati	2005 - 2009
6.	Visiting Res. Asst. Professor	University of Illinois, Chicago, USA	2003 - 2005
7.	Post-Doctoral Fellow	National Central University, Taiwan	2001 - 2003
8.	Post-Doctoral Fellow	KNU, South Korea	1999 - 2001
9.	Research Associate	IIT Madras	1998 - 1999

12. Areas of Research: Condensed Matter Physics & Material Science

13. Subject Specialization: Theoretical / Numerical Modeling for understanding various properties of pristine and functionalized nano-materials.

14. Courses Teach / Taught:

Undergraduate Courses	Quantum Physics, Mathematical Physics, Solid State Physics, Electricity and Magnetism, Computer Applications etc.
Postgraduate Courses	Quantum Mechanics, Mathematical Physics, Statistical Mechanics, Computer Applications, Condensed Matter Physics (Elective).
Ph.D. Course-work	Theoretical Condensed Matter Physics

15. Research Guidance:

(a) No. of Doctoral students (Completed / Ongoing): 05

(b) No. of M.Sc. Dissertations: 20

16. Research Grants/Projects

Sl. No.	Project Title	PI	Funding Agency	Amount	Completed/Ongoing
1.	ELECTRONIC STRUCTURE CALCULATIONS IN SEARCH OF METALLIC NANOWIRES ON SEMI-CONDUCTING SUBSTRATES	Bikash Chandra Gupta	CSIR	9.35 L	Completed

17. Professional Recognition/ Award/ Prize/Fellowship

Sl. No.	Name of Award	Awarding Agency	Year
1.	Summer Teaching Fellowship	University of Illinois, Chicago, USA	2007
2.	Summer Teaching Fellowship	University of Illinois, Chicago, USA	2008
3.	Summer Teaching Fellowship	University of Illinois, Chicago, USA	2009
4.	Adjunct Position	University of Illinois, Chicago, USA	2009
5.	Visiting Fellowship	Verginia Commonwealth University, USA	2011

18. List of Scientific Publications:

- 1) "Exploring Sc₂C and fluorinated Sc₂C MXenes for high-performance Mg-ion battery anodes" by Somnath Chowdhury, Mousumi Parvin, Jin Suk Chunga, Sung Gu Kanga, and Bikash Chandra Gupta, Journal of Power Sources 653, 237725 (2025).
<https://doi.org/10.1016/j.jpowsour.2025.237725> I.F. 7.9
- 2) "Symmetric and asymmetric surface-terminated MXenes as low diffusion barrier anode materials for SIBs and PIBs" by Tuya Dey, Bikash Chandra Gupta and Jagadish Chandra Mahato, International Journal of Hydrogen Energy 154, 150274 (2025).
<https://doi.org/10.1016/j.ijhydene.2025.150274> I.F. 8.3
- 3) "Two-dimensional ScTe₂ monolayer: An efficient anode material for sodium-ion battery and cathode material for lithium-ion and potassium-ion battery" by Tuya Dey, Somnath Chowdhury, Sung Gu Kang, Prasenjit Sen, Bikash Chandra Gupta and Jagadish Chandra Mahato, Computational Material Science 253, 113824 (2025). <https://doi.org/10.1016/j.commatsci.2025.113824> I.F. 3.3
- 4) "Theoretical prediction of the potential of using two-dimensional V₂S₂ as an effective anode for alkali metal ion batteries" by S Chowdhury, JC Mahato, JS Chung, SG Kang, Bikash Chandra Gupta, Surfaces and Interfaces 51, 104750 (2024). <https://doi.org/10.1016/j.surfin.2024.104750> I.F. 6.3
- 5) "Can P₃S and C₃S monolayers be used as anode materials in metal-ion batteries? An answer from first-principles study" by S Chowdhury, P Sarkar, Bikash Chandra Gupta, Physical Chemistry Chemical Physics 26 (22), 16240-16252, (2024). <https://doi.org/10.1039/d3cp06014d> I.F. 3.67
- 6) "Quantum spin Hall effect and emergence of conducting edge states in silicene supported by MX (M = Ga, In; X = S, Se, Te) monolayer" by S. Mondal, H. K. Chandra and B. C. Gupta, Modern Physics Letters B 2450196 (2024). <https://doi.org/10.1142/S0217984924501963> IF-1.9
- 7) "Rational design of two-dimensional buckled-hexagonal Nb₂S₂ monolayer as an efficient anode material for Ca-ion batteries: A first-principles study" by S. Chowdhury, P. Sen and B. C. Gupta, Computational Material Science 230, 112539 (2023). <https://doi.org/10.1016/j.commatsci.2023.112539> IF-3.3
- 8) H. K. Chandra, S. Mondal and B. C. Gupta, "Spin Hall Conductivity of Germanene Supported by Monolayer of Different Monochalcogenides and Emergence of Topologically Insulating States", Solid State Communications, 352 114830 (2022). <https://doi.org/10.1016/j.ssc.2022.114830> I.F. 1.9
- 9) M Das, S. Chowdhury and **B C Gupta**, "Atomic-Ordering-Induced Modulated Properties of Zigzag ZnTe Nanotubes", phys. status solidi (b) (2021), <https://doi.org/10.1002/pssb.202100115> I.F. 1.6
- 10) S Choudhury, P Mukherjee, M Das and **B. C. Gupta**, "Diameter-dependent structural and electronic property of fused porphyrin nanotubes: A density functional study", Journal of Porphyrins and Phthalocyanines, 24, 1021-1029 (2020), <https://doi.org/10.1142/S1088424620500121> IF-1.5
- 11) S Choudhury, P Mukherjee, M Das and **B C Gupta**, "Formation of charge transfer complex between metalloporphyrin and aromatic solvents in tetrahydrofuran media: A density functional study", Journal of Porphyrins and Phthalocyanines, 23, 1149-1157 (2019), <https://doi.org/10.1142/S1088424619501529> IF-1.5
- 12) M. Das and **B. C. Gupta**, "Width dependent structural and electrical properties of zigzag ZnTe nanoribbons" Phys. Lett. A, 383, 748-753 (2018), <https://doi.org/10.1016/j.physleta.2018.11.045>
- 13) B Roy, M Ghosh, P Mukherjee, S Chowdhury, **B C Gupta**, K. Majhi and S Sinha, "Ground state charge transfer complex formation of some metalloporphyrins with aromatic solvents: Further theoretical and experimental investigations", Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 188, Page: 311-317, (2018), <https://doi.org/10.1016/j.saa.2017.07.025>
- 14) M Das, P Mukherjee, S Chowdhury and **B C Gupta**, "Tunable structural and electrical properties of zigzag CdS nanotubes: A density functional study", Phys. Status Solidi B, 254, 1700038 (2017), <https://doi.org/10.1002/pssb.201700038>
- 15) P Mukherjee, **B C Gupta** and P Jena, "Magnetic properties of bimetallic clusters composed of Gd and transition metals" J. Applied Phys, 119, 074301 (2016), <https://doi.org/10.1063/1.4941826>

- 16) M Das and **B C Gupta**, "Properties of armchair ZnTe nanotubes: A density functional study" Computational Material Science, 112, 1, (2016), <https://doi.org/10.1016/j.commatsci.2015.10.004>
- 17) P Mukherjee, S Konar and **B C Gupta**, "Structural and electrical properties of selenium nanotubes" Phys. Letters A 380, 238 (2016), <https://doi.org/10.1016/j.physleta.2015.09.005>
- 18) S Mondal, **B C Gupta** and B C Bag, "Kramer's turnover phenomenon in the spatial diffusion region" by J. Stat. Mech.: Theory and Experiment), 2016, 013204 (2016), <https://iopscience.iop.org/article/10.1088/1742-5468/2016/01/013204>
- 19) M Das and **B C Gupta**, "Properties of armchair and zigzag CdS nanoribbons: A density functional study" Phys. Status Solidi B 252, 2280 (2015), <https://doi.org/10.1002/pssb.201552182>
- 20) P Mukherjee, **B C Gupta** and P Jena, "Catalytic activities of platinum nanotubes: A density functional study" The Eur. Phys. Journal B 88, 247 (2015), <https://doi.org/10.1140/epjb/e2015-60149-7>
- 21) P Mukherjee, **B C Gupta** and P Jena, "Chain-like structures of gold supported by silicon substrate" Phys. Status Solidi B 251, 924–932 (2014), <https://doi.org/10.1002/pssb.201350372>
- 22) M Das and **B C Gupta**, "Structural and electrical properties of armchair CdS nanotubes"; J. Appl. Phys. 115, 214307 (2014), <https://doi.org/10.1063/1.4881795>
- 23) M Das, P Mukherjee, S Konar and **B C Gupta**, "Work function and Young's modulus of Platinum Nanotubes: Density functional study", Phys. Status Solidi (b) 250, 1519 (2013), <https://doi.org/10.1002/pssb.201248594>
- 24) P Mukherjee, **B C Gupta** and P Jena, "Electronic and magnetic properties of pristine and transition metal doped ZnTe nanowires" J. Phys.: Condens. Matter 25, 266003 (2013), <https://doi.org/10.1088/0953-8984/25/26/266003>
- 25) "Electrical transition of (3, 3) carbon nanotube on patterned hydrogen terminated Si (001)-2 × 1 driven by electric field" by Bikash C. Gupta, S. Konar and P. Jena; J. Applied Physics 111, 123717 (2012), <https://doi.org/10.1063/1.4729565>
- 26) **B C Gupta**, S. Konar and P. Jena "Electric field-induced metallic transition of (3,3) carbon nanotube supported on patterned hydrogen-terminated Si (001):1 × 1 surface", J. Nanoparticle Research, 14, 909 (2012), <https://doi.org/10.1007/s11051-012-0909-2>
- 27) S. Konar and **B C Gupta**, "Electrical and structural properties of 4 Å carbon nanotube supported by patterned hydrogen terminated Si (001):3×1 surface: A density functional study", Phys. Rev. B 83, 245412 (2011), <https://doi.org/10.1103/PhysRevB.83.245412>
- 28) S Konar, **B C Gupta**, "Interaction of gold nanotubes with the Si (211) surface: A density functional study", Phys. Rev. B, 82 125458 (2010), <https://doi.org/10.1103/PhysRevB.82.125458>
- 29) S Konar, **B C Gupta**, "Formation of Gold atomic wires on hydrogenated Si (001):3×1 surface" Journal of Applied Physics, 106, 093712 (2009), <https://doi.org/10.1063/1.3248371>
- 30) **B C Gupta**, S Konar, C H Grein and S. Sivananthan, "Structural evolution due to Zn and Te adsorption on As-exposed Si (211): Density functional calculations", Journal of Phys.: Condensed Matter 21, 375502 (2009), <https://doi.org/10.1088/0953-8984/21/37/375502>
- 31) **B C Gupta**, S Konar and R Bose, "Adsorption of gold on hydrogen terminated Si (001): Formation of chain structure" Applied Surface Science, 256, 495, (2009), <https://doi.org/10.1016/j.apsusc.2009.07.064>
- 32) A Ciani, **B C Gupta** and I Batra; "Interaction of cholesterol with carbon nanotube" Solid State Comm. 147, 146 (2008), <https://doi.org/10.1016/j.ssc.2008.04.037>
- 33) S Konar and **B C Gupta**, "Density functional study of single wall-wall and double-wall platinum nanotubes", Phys. Rev. B 78, 235414, (2008), <https://doi.org/10.1103/PhysRevB.78.235414>
- 34) S Konar, **B C Gupta** and I Batra, "Atomic Gold chain on hydrogen terminated Si (001):1×1 surface: A density functional study", Phys. Rev. B 77, 245411 (2008), <https://doi.org/10.1103/PhysRevB.77.245411>
- 35) P Sen, **B C Gupta** and I Batra, "Structural studies of Phosphorus induced dimers" Phys. Rev. B 73, 085319 (2006), <https://doi.org/10.1103/PhysRevB.73.085319>
- 36) **B C Gupta**, U Chatterjee and Tanushri Som, "Microwave localization due to defects in arrays of dielectric cylinders: Multiple scattering approach", Phys. Lett. A 353, 76 (2006), <https://doi.org/10.1016/j.physleta.2005.11.049>
- 37) C Fulk, R Sporken, J Dumont, **B C Gupta**, G Brill, N Dhar, J Dinan and S Sivananthan "Arsenic Deposition as a Precursor Layer on Silicon (211) and (311) Surfaces", J. Electronic Material 34 846 (2005), <https://doi.org/10.1007/s11664-005-0030-8>
- 38) **B C Gupta** and I Batra; "Interrupted chain assisted Al nanowire on Si (211)" Phys. Rev. B, 72, 165352 (2005), <https://doi.org/10.1103/PhysRevB.72.165352>

- 39) **B C Gupta** and I Batra, "Metallic atomic wires on patterned di-hydrogenated Si (001)" *Phys. Rev. B* **71**, 165429 (2005), <https://doi.org/10.1103/PhysRevB.71.165429>
- 40) **B C Gupta**, I Batra and S Savananthan, "Growth of Te on As-exposed Si (211): Electronic Structure Calculations" *Phys. Rev. B* **71**, 075328 (2005), <https://doi.org/10.1103/PhysRevB.71.075328>
- 41) **B C Gupta** and I Batra, "Para to Ortho transition of metal dimers on Si (001)", *Phys. Rev B* **69**, 165322, (2004), <https://doi.org/10.1103/PhysRevB.69.165322>
- 42) **B C Gupta** and Z Ye, "Propagation inhibition and localization of electromagnetic waves in two-dimensional random dielectric systems" *Phys. Rev. E* **69**, 066615 (2004), <https://doi.org/10.1103/PhysRevE.69.066615>
- 43) **B C Gupta** and Z Ye, "Erratum: Theoretical analysis of the focusing of acoustic waves by two-dimensional sonic crystals (*Phys. Rev. E* **67**, 036603 (2003))" *Phys. Rev. E* **69**, 029906 (2004), <https://doi.org/10.1103/PhysRevE.69.029906>
- 44) **Z Ye** and **B C Gupta**, "About wave localization in two-dimensional random media" *Phys. Lett. A* **313**, 485 (2003), [https://doi.org/10.1016/S0375-9601\(03\)00854-5](https://doi.org/10.1016/S0375-9601(03)00854-5)
- 45) **B C Gupta** and Z Ye, "Disorder effects on the imaging of negative refractive lens made by arrays of dielectric cylinders" *J. Appl. Phys.* **94**, 053316 (2003), <https://doi.org/10.1063/1.1591071>
- 46) **B C Gupta** and Z Ye, "Focusing of electromagnetic waves by periodic arrays of dielectric cylinders", *Phys. Rev. B* **67**, 153109 (2003), <https://doi.org/10.1103/PhysRevB.67.153109>
- 47) **B C Gupta** and Z Ye, "Localization of classical waves in two-dimensional media: A comparison between theory and numerical simulation" *Phys. Rev. E* **67**, 036606. (2003), <https://doi.org/10.1103/PhysRevE.67.036606>
- 48) **B C Gupta** and Z Ye, "Theoretical analysis of the focusing of acoustic waves by two-dimensional sonic crystals", *Phys. Rev. E* **67**, 036603 (2003), <https://doi.org/10.1103/PhysRevE.67.036603>
- 49) **B C Gupta**, and S B Lee, "Interplay of linear and nonlinear impurities in the formation of stationary localized states", *J. Korean Phys. Soc.* **42**, 371 (2003), <https://arxiv.org/abs/cond-mat/0103243>
- 50) **B C Gupta** and S. B. Lee, "Interplay of linear and modified nonlinear impurities in the formation of stationary localized states", *J. Korean Phys. Soc.* **40**, 314 (2002), <https://arxiv.org/abs/cond-mat/0105489>
- 51) **B C Gupta**, P A Sreeram and S B Lee, "New way to achieve synchronization in spatially extended systems", *Mod. Phys. Lett. B* vol: **15** p:535 (2001), <https://doi.org/10.1142/S0217984901001987>
- 52) **B C Gupta** and S B Lee, "Self-trapping transition for nonlinear impurities embedded in the Cayley tree" *Phys. Rev. B* vol: **63** p: 144302 (2001), <https://doi.org/10.1103/PhysRevB.63.144302>
- 53) S B Lee and **B C Gupta**, "Influence of small cluster mobility on the island formation in molecular beam epitaxy" *Phys. Rev. B* vol: **62** p:7545 (2000), <https://doi.org/10.1103/PhysRevB.62.7545>
- 54) B C Bag, **B C Gupta** and D S Ray, "Dissipative tunneling in presence of classical chaos in a mixed quantum-classical system", *Phys. Lett. A* **255**, 65 (1999), [https://doi.org/10.1016/S0375-9601\(99\)00174-7](https://doi.org/10.1016/S0375-9601(99)00174-7)
- 55) by **Bikash C. Gupta** and S. B. Lee, "Stationary localized states due to nonlinear impurities, described by the modified discrete nonlinear Schrödinger equation" *Phys. Lett. A* **269**, 130 (2000), [https://doi.org/10.1016/S0375-9601\(00\)00244-9](https://doi.org/10.1016/S0375-9601(00)00244-9)
- 56) **B C Gupta**, "Stationary localized states in one dimensional system due to modified nonlinear impurities" *Phys. Rev. B* **60**, 6194 (1999), <https://doi.org/10.1103/PhysRevB.60.6194>
- 57) P S Deo, **B C Gupta**, A M Jayannavar and F M Peeters, "Conductance quantization in a periodically modulated quantum Channel: Backscattering and mode mixing" *Phys. Rev. B* **58**, 10784 (1998), <https://doi.org/10.1103/PhysRevB.58.10784>

- 58) A Ghosh, **B C Gupta** and K Kundu; “Stationary localized states due to quadratic nonlinearity in one dimensional system” J. Physics: Condensed Matter 10, 2701 (1998), <https://doi.org/10.1088/0953-8984/10/12/010>
- 59) K Kundu and **B C Gupta**, “The role of power law nonlinearity in the discrete nonlinear Schrödinger equation on the formation of stationary localized states in the Cayley tree” Euro. Phys. J. B. 3, 23 (1998), <https://doi.org/10.1007/s100510050280>
- 60) **B C Gupta** and P A Sreeram, “Dynamics of an electron in finite and infinite one-dimensional systems in presence of electric field”, Phys. Rev. B 57, 4358 (1998), <https://doi.org/10.1103/PhysRevB.57.4358>
- 61) **B C Gupta** and K Kundu, “Localized states in 1-D nonlinear chain” Phys. Lett. A 235, 176 (1997), [https://doi.org/10.1016/S0375-9601\(97\)00587-2](https://doi.org/10.1016/S0375-9601(97)00587-2)
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- 63) **B C Gupta**, P K Datta, T P Pareek and A M Jayannavar, “Dynamical localization-delocalization transition in two-level nonlinear systems driven by laser field” Physica B 240, 13 (1997), [https://doi.org/10.1016/S0921-4526\(97\)00357-8](https://doi.org/10.1016/S0921-4526(97)00357-8)
- 64) **B C Gupta** and K Kundu, “Formation of stationary localized states due to nonlinear impurities using the discrete nonlinear Schrödinger equation”, Phys. Rev. B 55, 894 (1997), <https://doi.org/10.1103/PhysRevB.55.894>
- 65) **B C Gupta** and K Kundu, “Conference Paper: The self-trapping transition in the two-dimensional system with nonlinear impurity” Indian J. Phys. vol: 70 A, 747 (1996).
- 66) **B C Gupta**, P S Deo and A M Jayannavar, “Aharonov-Bohm effect in the presence of evanescent modes” Int. J. Mod. Phys. B 10, 3595 (1996), <https://doi.org/10.1142/S021797929600194X>
- 67) **B C Gupta** and K Nanda, “Specific heat of high-temperature superconductors: Role of $|\psi|^4$ term in the Ginzburg-Landau free energy”, Physica C 265, 228 (1996), [https://doi.org/10.1016/0921-4534\(96\)00300-0](https://doi.org/10.1016/0921-4534(96)00300-0)

19. Talks Delivered at International / National Conferences/Seminars/Symposium: (Selective)

1. “Emergence of Quantum Physics” in State level Seminar, Quantum Mechanics: Theoretical Concepts and Applications, November 22-23, 2013 at Department of Physics, Domkal College, Murshidabad.
2. “Free and supported nano-structures: structural, electrical and magnetic properties” on September 03, 2015 at the national Institute, Institute of Physics, Bhubaneswar (seminar organized during Alumni Day celebration).
3. “Structural, Electrical, catalytic and magnetic Properties of nano-structures” on National level programme, “Recent Trends in Chemistry with reference to teaching and research”, March 13-14, 2015 at Department of Chemistry, Visva-Bharati.
4. “Properties of Nanostructured Materials: DFT Study” on 18.09.2018 at the “3rd Refresher Course in Nano-Science & Nano-Technology” organized by Academic Staff College, University of Burdwan.
5. “Structural, Electrical and Catalytic Properties of Platinum Nanotubes” in International Conference: International Symposium on Nanostructures and their applications in renewable energy, October 24-28, 2013, Peking University, Beijing, China.
6. “Platinum nanotubes: Structural, Electrical and Catalytic Properties” in National Conference on Condensed Matter Physics and Applications, March 27-28, 2015, Department of Physics, Manipal Institute of Technology, Manipal.

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