ARPON CHAKRABORTY

Lecturer, Department of Physics, Gopalganj Science and Technology University
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Google Scholar: https://scholar.google.com/citations?user=BcBfxN8AAAAJ&hl
ResearchGate: https://www.researchgate.net/profile/Arpon-Chakraborty

RESEARCH INTEREST

Condensed Matter Physics (First Principles Calculations, Experimental Nanoscience)

EDUCATION

M.Sc. in Physics 21 March, 2021 – 08 December, 2022

- University of Rajshahi, Bangladesh
- GPA: 3.97 out of 4
- Ranked 1st in my class
- Thesis Title: A comprehensive DFT insights of $BaTiO_3$ polymorphs and experimental study of the effects of (Sr, Ni) substitution on the cubic phase.

B.Sc. (Honors) in Physics 06 February, 2016 – 18 February, 2021

- University of Rajshahi, Bangladesh
- CGPA: 3.90 out of 4
- Ranked 1st in my class

PROFESSIONAL EXPERIENCE

Lecturer, Department of Physics, 13 July, 2023 – Present
Gopalganj Science and Technology University, Bangladesh

- Conducting classes (Offered Courses: Thermal Physics, Statistical Mechanics, Advanced Solid State Physics, Superconductivity, Nano Physics), Lab sessions (Physics Lab III, IV), Tutorial session, Grading exam papers, proctoring exams, etc.

Assistant Provost, Bijoy Didosh Hall 17 August, 2025 –
Gopalganj Science and Technology University, Bangladesh 23 July, 2026

LANGUAGE PROFICIENCY

International English Language Testing System (IELTS)

- Overall Band: 7.5 (Listening - 8.0, Reading – 8.5, Writing – 6.5, Speaking – 6.0)

RESEARCH PUBLICATIONS

1. **A. Chakraborty**, M. N. H. Liton, M. S. I. Sarker, M. M. Rahman, M. K. R. Khan, *A comprehensive DFT evaluation of catalytic and optoelectronic properties of $BaTiO_3$ polymorphs*, Physica B: Condensed Matter **648**, 414418 (2023).
https://doi.org/10.1016/j.physb.2022.414418

2. **A. Chakraborty**, M. N. H. Liton, M. S. I. Sarker, M. M. Rahman, M. K. R. Khan, *Exploration of the structural, vibrational, electronic, mechanical and thermal properties of $Ru_4Al_3B_2$ and $Ru_9Al_3B_8$: a DFT study*, RSC Advances **13**(41), 28912 (2023).
https://doi.org/10.1039/d3ra05334b

3. Md. S. Sorker, Md. R. Islam, **A. Chakraborty**, Md.A. Razzak Sarker, *First-principles and experimental study to investigate structural, elastic, electronic, thermal, and optical properties of $KCdCl_3$ metal halide perovskite crystals*, AIP Advances **14**, 045038(2024).
https://doi.org/10.1063/5.0206191

4. T. K. Ghosh, M. N. H. Liton, **A. Chakraborty**, M. K. R. Khan, M. S. I. Sarker, *Atomic position dependent structural, electronic, mechanical and optical properties of $ZnSbF_3$ fluoroperovskites*, Materials Science in Semiconductor Processing **187**, 109065 (2025).
https://doi.org/10.1016/j.mssp.2024.109065

5. Md. R. Islam, P. Mondal, **A. Chakraborty**, *First-principles study of the ground-state properties of ternary borides with the Ru_3B_2X (X = Th, U) type structure: a comparative analysis*, Materials Advances **6**, 3293–3313 (2025).
https://doi.org/10.1039/d5ma00091b

6. Md. I. Haque, **A. Chakraborty**, Mst. H. Khatun, Md. S. I. Sarker, M. K. R. Khan, Md. L. Ali, Md. Shahjahan, Md. N. H. Liton, *Comparative Insights Into the Structural, Electronic, Elastic, Vibrational, and Optical Properties of Rare‐Earth Palladium Borides $RBPd_3$ (R = Lu, Yb)*, Nano Select **6** (12), e70038 (2025).
https://doi.org/10.1002/nano.70038

7. R. Amin, Mst. H. Khatun, M. A. A. Asad, **A. Chakraborty**, Mst Khanom, J. K. Modak, Md. Shahjahan, *Structural, optical, and dielectric properties of Al–Zn co-doped SnO_2 nanoparticles synthesized by co-precipitation method*, The European Physical Journal Plus **140** (8), 1-10 (2025).
https://doi.org/10.1140/epjp/s13360-025-06737-8
8. **A. Chakraborty**, M. N. H. Liton, Mst. H. Khatun, M. Shahjahan, *Unveiling phase dependent physical properties of cubic and hexagonal $CsCdBr_3$: a DFT approach*, Materials Advances **6**, 8615 - 8634 (2025).
https://doi.org/10.1039/d5ma00693g
9. C. Sarker, S. S. Pakhi, M. N. H. Liton, M. R. Islam, Mst. H. Khatun, M. K. Hossain, M. Shahjahan, **A. Chakraborty**, *Exploring the multifunctional properties of MC_2B_2 (M = Lu, La) structures using density functional theory*, Advanced Theory and Simulations **9** (2), e01440 (2026).
https://doi.org/10.1002/adts.202501440
10. Mst. H. Khatun, R. Amin, **A. Chakraborty**, Md. I. Haque, W. Islam, M. S. I. Sarker, S. Islam, N. I. Tanvir, Md. Shahjahan, *Effect of sintering temperature on structural, optical, dielectric and magnetic properties of Fe, Ni co-doped SnO_2 nanoparticles*, Indian J Phys (2026).
https://doi.org/10.1007/s12648-025-03900-w
11. R. Majumder, **A. Chakraborty**, M. A. Habib, M. S. Mina, M. T. Islam, M. T. Islam, R. Saha, *First-principles study of mixed-halide perovskites $RbSrBr_{3-x}I_x$: Tuning physical properties through halide alloying*, Physica B: Condensed Matter **727**, 418369 (2026).
https://doi.org/10.1016/j.physb.2026.418369
12. M. B. Uddin, M. H. K. Rubel, S. Bouhmaidi, **A. Chakraborty**, M. K. Hossain, S. Ahmad, M. N. Sakib, M. A. Rashid, L. Setti, S. Sharmin, S. H. Naqib, M. A. Mannan, *Thallium-Based Iodo-Perovskites $TlMI_3$ (M= Ca, Sr) for Optoelectronic and Thermoelectric Applications: A DFT Investigation*, Journal of Physics and Chemistry of Solids **217**, 113796 (2026).
https://doi.org/10.1016/j.jpcs.2026.113796
13. M. R. Jannat, F. Z. Mim, M. K. Hossain, **A. Chakraborty**, M. A. Sayed, A. K. M. F. U. Islam, M. A. Helal, M. K. R. Khan, M. N. H. Liton, *Exploring the multifunctional properties of $RbCdX_3$ (X= F, Cl, Br) perovskites for sustainable energy applications: A DFT scheme*, ChemPhysMater (2026).
https://doi.org/10.1016/j.chphma.2026.06.002

CONFERENCE PRESENTATIONS

National Conference on Physics – 2021, Bangladesh Physical Society 6 – 7 August, 2021

- Electronic structure and optical properties of cubic $BaTiO_3$ (BTO): a DFT study

National Conference on Physics – 2023, Bangladesh Physical Society 9 – 11 March, 2023

- Study of the Influence of (Sr, Ni) Substitution on the Cubic $BaTiO_3$ (BTO)

International Conference on the role of Science and Technology towards 4IR – 2023, Faculty of Science, University of Rajshahi 5 – 6 October, 2023

- Optoelectronic Properties of $CsCdBr_3$ from an Ab Initio Approach

National Conference on Physics – 2025, Bangladesh Physical Society 6 – 7 February, 2025

- Comparative Analysis of Structural, Electronic, Elastic and Optical Properties of $LuBPd_3$ and $YbBPd_3$: An ab initio Study

RESEARCH EXPERIENCE

M.Sc. Research Student March 2021 – June 2023
Graduate Research Assistant to Prof. M. Khalilur Rahman Khan,
Materials Science Laboratory,
Department of Physics,
University of Rajshahi, Bangladesh.

TECHNICAL SKILLS

- **Language/Scripts:** Python (Basic), LaTex, Origin, Zotero
- **Programs:** VASP, CASTEP, WIEN2k, phonopy, Quantum Espresso, LAMMPS
- **Experimental Methods:** Solid State Reaction Method, Sol-gel Method, Spray Pyrolysis Method, Spin Coating Method, UV-Vis Spectrometer

EXTRA CURRICULAR ACTIVITIES

Former Assistant Seminar Secretary 2017 – 18
Physics Association
Department of Physics, University of Rajshahi, Bangladesh.

AWARDS & HONORS

Yearly University Scholarship for Merit 2017 – 2021

Dean's Award – 2021 2023
Faculty of Science, University of Rajshahi, Bangladesh

Prof. Arun Kumar Basak Award – 2019 2023
Department of Physics, University of Rajshahi, Bangladesh
(This is awarded for securing the 1st position in Bachelor of Science)

NST Fellowship 2022
Ministry of Science and Technology, Dhaka, Bangladesh
(This fellowship is awarded to support my Master's thesis)

General Scholarship 2022
Faculty of Science, University of Rajshahi, Bangladesh

RESEARCH GRANTS

Gopalganj Science and Technology University, Bangladesh 2023 – 24

- Role: PI
- Title: A first-principles study of the optoelectronic, mechanical and thermodynamic properties of $CsCdBr_3$ polymorphs

Gopalganj Science and Technology University, Bangladesh 2024 – 25

- Role: PI
- Title: A comparative study of the structural, electronic, magnetic and thermoelectric properties of anti-perovskite Fe_3MN (M=Rh, Pd, Pt) compounds from first principles perspective

REFERENCES

Prof. Dr. M. Khalilur Rahman Khan
PhD, Yamanashi University, Japan
Affiliation: Department of Physics, University of Rajshahi, Bangladesh
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Prof. Dr. Abdullah Shams Bin Tariq
PhD, University of Southampton, UK
Affiliation: Department of Physics, University of Rajshahi, Bangladesh
Email: asbtariq@ru.ac.bd

Prof. Dr. Md. Shahjahan
PhD, Toyohashi University of Technology, Japan
Affiliation: Department of Physics, Gopalganj Science and Technology University, Bangladesh
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