Dr. Md. Bulu Rahman

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Work Experiences:

1) Currently working as an Associate Professor under department of Physics, at Gopalganj Science and Technology University, Gopalganj from 30th June 2026 to present.
2) Worked as Assistant Professor under department of Physics, at Gopalganj Science and Technology University from 21st July 2019 to 29th June 2026. where I joined as a lecturer on 22nd April 2018.
3) Served as a full-time Senior lecturer of Physics at Green University of Bangladesh, Dhaka, under Dept. of EEE from 4th June 2016 to 21st April 2018, where I worked as a full-time lecturer from 15th May 2012 to 3rd June 2016.

List of Publications:

1) Hossen, M.J., **Rahman, M.B**., Miah, M.H. et al. Modelling and optimization of high efficiency Pb-free Cs-based halide double perovskite solar cell using SCAPS-1D. J Opt (2025). https://doi.org/10.1007/s12596-025-02550-9
2) Md. Helal Miah, **Md. Bulu Rahman**, Mohammad Nur-E-Alam, Mohammad Aminul Islam, M. Shahinuzzaman, Md. Rezaur Rahman, Md. Habib Ullahi and Mayeen Uddin Khandaker. Key degradation mechanisms of perovskite solar cells and strategies for enhanced stability: issues and prospects. RSC Adv., 2025, 15, 628-654. https://doi.org/10.1039/D4RA07942F
3) N. E. Ashrafi, M. H. Miah, **M. B. Rahman**, M. Aminul Islam, M. U. Khandaker, Revealing the high-performance of a novel Ge-Sn-Based perovskite solar cell by employing SCAPS-1D. *Physica Scripta* **2024**, *99*, 065969. https://doi.org/10.1088/1402-4896/ad482c
4) **Rahman, M.B**.; Islam, A.; Iimori, T. Exciton Delocalization and Polarizability in Perylenetetracarboxylic Diimide Probed Using Electroabsorption and Fluorescence Spectroscopies. *Molecules* **2024**, *29*, 2206. https://doi.org/10.3390/molecules29102206
5) Band gap tuning of perovskite solar cells for enhancing the efficiency and stability: issues and prospects. M. H. Miah, M. U. Khandaker, **M. B. Rahman**, M. Nur-E-Alam, M. A. Islam, *RSC advances* **2024**, *14*, 15876-15906. https://doi.org/10.1039/D4RA01640H
6) First-principles study of the structural, mechanical, electronic, optical, and elastic properties of non-toxic XGeBr3 (X=K, Rb, and Cs) perovskite for optoelectronic and radiation sensing applications. Miah, Md Helal; Ashrafi, Noor–E; **Rahman, Md Bulu**; Alam, Mohammad Nur- E.; Islam, Mohammad Aminul; Nasser, K. A.; Hanfi, Mohamed Y.; Osman, Hamid; Khandaker, Mayeen Uddin. Materials Chemistry and Physics, Volume 319, 1 June 2024, 129377. https://doi.org/10.1016/j.matchemphys.2024.129377
7) Selection of a compatible electron transport layer and hole transport layer for the mixed perovskite $FA_{0.85}Cs_{0.15}Pb\ (I_{0.85}Br_{0.15})_3$, towards achieving novel structure and high-efficiency perovskite solar cells: a detailed numerical study by SCAPS-1D. **Rahman, Md Bulu**; Noor, E. Ashrafi; Miah, Md Helal; Khandaker, Mayeen Uddin; Islam, Mohammad Aminul. *RSC Adv.*, 2023,13, 17130-17142. https://doi.org/10.1039/D3RA02170J.
8) Mohammad Aminul Islam, Md Jakir Hossen, Hairul Mardiah Hamzah, Sharifah Fatmadiana Wan Muhammad Hatta, Norhayati Binti Soin and **Md. Bulu Rahman**, Device Optimization of a High-

Efficiency Lead-Free Perovskite-Perovskite Tandem Solar Cell, Acta Scientific Applied Physics, Volume 3, Issue 4, April 2023.

9) Md. Helal Miah, **Md. Bulu Rahman**, Fatema Khatun, Mayeen Uddin Khandaker, Sharifah Fatmadiana Wan Muhammad Hatta, Norhayati Binti Soin, Mohammad Aminul Islam, Optimization and detail analysis of novel structure Pb-free $CsGeI_3$-based all-inorganic perovskite solar cells by SCAPS-1D, Optik, Volume 281, 2023, 170819, ISSN:0030-4026 https://doi.org/10.1016/j.ijleo.2023.170819
10) Miah Md Helal, **Rahman Md Bulu**, Mohammad Nur-E-Alam, Das Narottam, Soin Norhayati Binti, Hatta Sharifah Fatmadiana Wan Muhammad, Islam Mohammad Aminul, 2023, Understanding the Degradation Factors, Mechanism and Initiatives for Highly Efficient Perovskite Solar Cells, ChemNanoMat, John Wiley & Sons, Ltd, Volume 09, Issue 03, e202200471, 2023/03/01, https://doi.org/10.1002/cnma.202200471, ISSN: 2199-692X
11) "Laser-Induced Breakdown Spectroscopy (LIBS) for Trace Element Detection: A Review", ZH Khan, M Hedayet Ullah, **Bulu Rahman**, Aminul I Talukder, Md Wahadoszamen, KM Abedin, AFMY Haider, Journal of Spectroscopy (Hindawi)**,** vol. 2022, Article ID 3887038, 25 pages, 2022, https://doi.org/10.1155/2022/3887038
12) "Survey of the water bodies for eco-toxic metals by laser-induced breakdown spectroscopy" Haider Abul F.M. Yousuf, **Bulu Rahman**, Zulfiqar. H. Khan, Abedin Kazi M., Environmental Engineering Science, April 2015, Volume-32, Issue-4: 284-291. https://doi.org/10.1089/ees.2014.0170
13) "Computation of radiological dose of different pathways due to fictional accident of triga mark-II research reactor", M.A. Malek, **Md. Bulu Rahman** and S.M. Azharul Islam, GUB journal of science and Engineering, Vol-2, Issue-1, January-2015.
14) "An approach to determine the efficiency of LIBS system in aqueous solution using optical instruments" **Md. Bulu Rahman**, Md. Masum Billah*, Khondokar Nazmus Sakib, M.sheikh Dobir Hossain, M.A. Malek and Abul F.M. Yusuf Haider; J. Sci. Technol. Environ. Inform. 03(01): 178-190 | Rahman et al. (2016), http://dx.doi.org/10.18801/jstei.030116.20
15) "Determination of Subcutaneous Fat-layer Thickness using Focused Impedance Method and Correlation with the Measurements using Conventional Methods"; Billah MM, Al-Quaderi GD, **Rahman MB**, Rabbani KS; Journal of Jessore University of Science and Technology; Vol. 01; 15- 25; December 2016.

Conferences:

[1] Electroabsorption Spectroscopy of BOPHY Derivatives: Probing Charge Transfer Character in the Excited State. Fourteenth International Conference on Porphyrins and Phthalocyanines, Toshifumi Iimori, Md. Bulu Rahman, Victoria Villarreal, Victor Nemykin, 3rd July, 2026 (Oral)

[2] Exciton transport mechanism in self-assembled perylenediimide : exciton coherent length probed using electroabsorption spectroscopy, The 20th Annual Meeting of Japan Society for Molecular Science, Rahman Md. Bulu, Islam Ahtashamul Islam, Toshifumi Iimori, 18th Sept. 2026 (Oral).

[3] Md. Bulu Rahman, Toshifumi Iimori; Excited State properties of n-type semiconductor perylenetetracarboxylic diimide probed using electric field modulation spectroscopy, Hokkaido University, Faculty of Engineering, 50th Hokkaido Branch of the Japan Society of Applied Physics, 6th to 7th January 2024.

[4] "Coherent energy transfer in self assembled perylenetetracarboxylic diimide through electroabsorption spectroscopy". Md. RAHMAN, Ahatashamul ISLAM, Toshifumi IIMORI, 2024, Photochemistry Symposium, Photochemical Society of Japan, September 3, 2024, 3P001.

[5] "Probing Exciton Delocalization in n-Type Organic Semiconductor Perylenetetracarboxylic Diimide Using Stark Spectroscopy", Md Bulu Rahman, Toshifumi Iimori, The 85th JSAP Autumn Meeting 2024, 16p-B6-1~23, 16th September 2024.

[6] Exciton delocalization in π-conjugated cycloparaphenylene and aggregated perylenetetracarboxylicdiimide using electroabsorption and Stark fluorescence spectroscopy, Rahman, Md. Bulu; Kono, Sho; Islam, Ahatashamul; Iimori, Toshifumi, 1P16, 40th SCKD, 4th June 2025, Kobe University Centennial Hall, Graduate School of Science, Kobe University.

[7] Survey of the Water Bodies around Dhaka City for Eco-toxic Metals by Laser-induced Breakdown Spectroscopy K. M. Abedin*, A.F.M. Yusuf Haider and M. B. Rahman, Physics Department, University of Dhaka-1000, Dhaka, Bangladesh, P42, LIBS 2012, LUXOR, Egypt.

[8] **Internship**-From 18th Nov. 2024 to 13th Dec. 2024, at AminoUp company, Shin-ei, Kiyota-ku, Sapporo, Japan.

[9] **Workshop**-Exciton Dynamics and Delocalization in Self-Assembled n-Type Organic Semiconductor Perylenetetracarboxylic Diimide: Insights from Stark Spectroscopy, Md. Bulu Rahman, Toshifumi Iimori, P-03, CCC workshop, MuIT

Thesis Work:

- **PhD :** Electronic States of π-Conjugated Organic Semiconductor and Fluorescent Probe Molecules Using Electric Field Modulation Spectroscopy
- **M.Sc. :** Detection of Eco-toxic Metals in Water Bodies around Dhaka City by Laser-Induced Breakdown Spectroscopy.

Research Experience:

- Awarded MEXT Scholarship by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of the Japanese Government. (October 2022 to September 2025)

- Worked as a "Research Fellow" under AIF-HEQEP-UGC-WB sub-project titled "Monitoring of Surface Pollution and Atmospheric Condition in Bangladesh by Laser-based technique".

Research Fields:

- Molecular Spectroscopy (Stark Spectroscopy).
- Laser-induced breakdown spectroscopy (LIBS) and its applications.
- Material Sciences

Academic Credentials:

Level	Educational Institution	Exam Passed	Results	Passing Year	Session	Field/Branch
PhD	Muroran Institute of Technology, Japan	Doctor of Engineering	Passed	2025	2022-23	Molecular Spectroscopy
M.Sc.	Dhaka University	M.Sc.	1st Class 2nd (76.83% Marks)	2012	2008-09	Physics
B.Sc.	Dhaka University	B.Sc.	1st Class 6th (65.81% Marks)	2010	2004-05	Physics
HSC	Saidpur Govt. Technical College, Nilphamary	HSC	A+	2004	2002-03	Science
SSC	Kchona SC High School, Dinajpur	SSC	A	2002	2000-01	Science

Teaching and Research Supervision:

- Taught courses in LASER Physics, Advanced Nuclear Physics, Classical Electrodynamics, Thermal Physics, Electronics, Electricity and Magnetism, and Nanophysics in undergrade and post graduate levels.
- Instructed experimental courses in the 1st Year, 2nd Year, and 3rd Year B.Sc. (Honors) undergrade students at GSTU, Gopalganj.
- Supervised more than 15 students for their undergrade research project.