

Curriculum Vitae of

Abu Kowsar

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EDUCATIONAL QUALIFICATION

M.Sc.: Department of Applied Physics, Electronics and Communication Engineering,
University of Dhaka,
Passing Year: 2010, Degree Awarded: November, 2012

B.Sc.: Department of Applied Physics, Electronics and Communication Engineering,
University of Dhaka,
Passing Year: 2009, Degree Awarded: May, 2011.

PROFESSIONAL/ RESEARCH EXPERIENCE

November 2020- Present

Senior Scientific Officer

Institute Fuel Research and Development (IFRD),
Bangladesh Council of Scientific & Industrial Research (BCSIR)
Dhaka, Bangladesh

July 2015 – November 2020

Scientific Officer

Institute Fuel Research and Development (IFRD),
Bangladesh Council of Scientific & Industrial Research (BCSIR)
Dhaka, Bangladesh

April 2014 -July 2015

Post Graduate Fellow,

Institute Fuel Research and Development (IFRD),
Bangladesh Council of Scientific and Industrial Research (BCSIR)

ACHIEVEMENTS (Summary):

1. Securing the first position in the selection examination of BCSIR *Scientific Officer* post for Applied Physics out of the 63 postgraduate applicants.
 2. Awarded the First Prize among 175 participants for presenting multijunction solar cell simulator (MSCS-1D) at International Conference on Science and Technology for Celebrating the Birth Centenary of Bangabandhu (ICSTB-2021).
 3. Awarded the Best Poster Award from the National Conference on Physics-19. February 2019, Dhaka, Bangladesh.
 4. Awarded the third prize from Inter-University Innovation Competition, Ministry of Power and Energy, Government of Bangladesh, October 2016.
 5. Received three competitive external research grants (R&D) from the Ministry of Science and Technology, Bangladesh as Principal Investigator and three internal R&D grants as Project Leader from the BCSIR, Bangladesh.
 6. Published fourteen Web of Science (SCIE & ESCI) and Scopus indexed papers as a lead, corresponding, and co-author, presented several oral and poster presentations.
 7. Recipient of 2 Patent rights (WIPO Bangladesh Chapter), and 1 Technical Note (Industrial Process) from BCSIR.
 8. Supervised undergraduate and MS thesis students at BCSIR.
 9. Google Scholar h-index: 08
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ON-GOING R&D PROJECTS

1. **Project Title:** Techno-economic evaluation of a micro-grid photovoltaic system for healthcare center
Role: Project Leader (Principal Investigator)
Tenure: 2021-22
2. **Project Title:** Development of a novel modeling and simulation tool for solar cells.
Role: Project Leader (Principal Investigator)
Tenure: 2019-22

COMPLETED R&D PROJECTS

3. **Project Title:** Development of a high efficiency one dimensional multijunction solar cell simulator (MSCS-1D) for cost-effective solar panel fabrication: Version-3 (MSCS-1D: V3)
Role: Principal Investigator
Tenure: 2020-21
4. **Project Title:** Development of a high efficiency one dimensional multijunction solar cell simulator (MSCS-1D) for cost effective solar panel fabrication: Version-2 (MSCS-1D: V-2)
Role: Principal Investigator
Tenure: 2018-19
5. **Project Title:** Design and development of a low-cost Green Refrigerator and Solar Hybrid Electric Cooker
Role: Project Leader (Principal Investigator)
Tenure: 2017-18
6. **Project Title:** Development of a high efficiency multijunction solar cell simulator for cost effective solar panel fabrication, Special Allocation from Ministry of Science and Technology.
Role: **Role:** Principal Investigator
Tenure: 2017-18

Google Scholar ID: <https://scholar.google.com/citations?user=H0NPcAoAAAAJ&hl=en>

Scopus ID: <https://www.scopus.com/authid/detail.uri?authorId=57188752251>

Publications:

1. **Abu Kowsar**, Syed Nazmus Sakib, Masum Billah, Sujoy Dey, Khaledun Nahar Babi, Ali Newaz Bahar, Syed Farid Uddin Farhad, “A novel simulator of multijunction solar cells: MSCS-1D” *Journal of Renewable Energy Research*, V (9(2)), Pp 579-598, 2020 (Scopus and ESCI index journal, IF: 5.12).
2. **Abu Kowsar**, Sumon Chandra Debnath, Md. Saidul Islam, Al Newaz Bahar, Syed Farid Uddin Farhad, “Numerical Simulation of the High Efficiency Triple Junction Concentrator Photovoltaic Cells Using MSCS-1D” 48th IEEE Photovoltaic Specialist Conference (PVSC), IEEE Xplore, USA, 2021.
3. **Abu Kowsar**, Sumon Chandra Debnath, Md. Saidul Islam, Masum Billah, Ali Newaz Bahar, Syed Farid Uddin Farhad, “Simulation and Performance Optimization of High Efficiency Triple-junction Solar Cells Using an Advanced MSCS-1D Simulator”, *Accepted Journal of Renewable Energy Research*, (Scopus and ESCI index journal, IF: 5.12), 2021.
4. **Abu Kowsar**, Sumon Chandra Debnath, Md. Saidul Islam, Sadekul Azam, Dr. SFU Farhad, “An Advanced One-Dimensional Multijunction Solar Cell Simulator - MSCS-1D: V2”, *International Conference on Science and Technology for Celebrating the Birth Centenary of Bangabandhu (ICSTB-2021)*, (**Best poster award: First Prize winner**).
5. **Abu Kowsar**, Masum Billah, Sujoy Dey, Sazzatul Yeakin, Sumon Chandra Debnath, Syed Farid Uddin Farhad, 2nd International Conference on Innovation in Engineering and Technology (ICIET), IEEE Xplore, 2020.
6. Md. Billal Hosen, Md. Karamot Ali, Md. Asaduzzaman, **Abu Kowsar**, Ali Newaz Bahar, “Performance Optimization of ZnS/CIGS Solar Cell with over 25% Efficiency Enabled by Using a CuIn_3Se_5 OVC Layer ”, *Journal of Renewable Energy Research*, V (9(4)), Pp 579-598, 2020 (Scopus and ESCI index journal, IF: 5.12).
7. Mashudur Rahman, **Abu Kowsar**, Nawshad Haque, Firoz Alam Khan, Kahndokar Shaleque, “Photovoltaic energy in Bangladesh: Recent scenario, techno-economic evaluation, potential and challenges”, *Special issue on Water Energy and Environmental Sustainability*, *Journal of the Indian of Chemical Society*, (SCI & Scopus Index), 2020.
8. **Abu Kowsar**, Mashudur Rahaman, Abdullah Yousuf Imam, Md. Saidul Islam, Zahid Hasan Mahmood, Syed Farid Uddin Farhad *et al.*, *Progress in Major Thin-film Solar Cells: Growth Technologies, Layer Materials and Efficiencies*”, *Journal of Renewable Energy Research*, Vol. 9(2), Pp 579-598, 2019 (Scopus and ESCI index journal, IF: 5.12).
9. M. Hossain, N. I. Tanvir, M. S. Bashar, **A. Kowsar**, S. Islam, and S. F. U. Farhad, “Synthesis and Characterization of Oriented Phase Pure Cu_2O Thin Films Grown by A Simple Potentiostatic Electrodeposition Technique”, *National Conference on Physics*, 7-9 February, Dhaka, 2019. (**Best poster award winner**).
10. **Abu Kowsar** and Syed FaridUddin Farhad, “High Efficiency Four Junction III-V Bismide Concentrator Solar Cell: Design, Theory, and Simulation” *International Journal of Renewable Energy Research*, Vol. 8 Issue 3. Pp 1762-1769, 2018, (Scopus and ESCI index journal, IF: 5.12).

11. **Abu Kowsar**, Syed Farid Uddin Farhad, Nasifa Akter, Kawsar Ahmed, Mst. Sarmina Yesmin, Md. Abdul Jalil, Hosney Ara Begum, Md. Moin Uddin and Most. Hamida Khatun, "Design, construction and performance studies of a non-electric refrigerator using eco-friendly refrigerant materials," *Journal of Fundamentals of Renewable Energy and Applications*, 8(4):1000264, 2018. USA (Impact factor: 1.43)
12. **Abu Kowsar**, Syed Farid Uddin Farhad, and Syed Nazmus Sakib, "Effect of the Bandgap, Sun Concentration and Surface Recombination Velocity on the Performance of a III-V Bismide Multijunction Solar Cells", *International Journal of Renewable Energy Research*, Vol. 8 Issue 4. Pp 2218-2227, 2018, (Scopus and ESCI index journal, IF: 5.12).
13. Sabbir Akhanda, Rummana Matin, Muhammad Shahriar Bashar, Munira Sultana, **Abu Kowsar**, Mashudur Rahaman and Zahid Hasan Mahmood, "Effect of annealing atmosphere on structural and optical properties of CZTS thin films prepared by spin-coating", *Bangladesh Journal of Scientific and Industrial Research (BJSIR)*, 53(1):13., 2018.
14. Sabbir Akhanda, Rummana Matin, Muhammad Shahriar Bashar, **Abu Kowsar**, Mashudur Rahaman and Zahid Hasan Mahmood, "*Experimental Study on Structural, Optical and Electrical Properties of Chemical Bath Deposited CdZnS Thin Films*", *Journal of Fundamentals of Renewable Energy and Applications*, Vol 7(1), 2017, USA, (Impact factor: 1.43)
15. Shamima Khanom, Md. Kamal Hossain, Farid Ahmed, Md. Abul Hossain, **Abu Kowsar**, Mashudur Rahaman: *Simulation study of multijunction solar cell incorporating GaAsBi*. 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC); IEEE Xplore, **2017**.
16. Syed Nazmus Sakib, Syeda Puspita Mouri, **Abu Kowsar**, Mashudur Rahaman, M. Shamim Kaiser, "Theoretical Efficiency of AlAs/GaAs/GaAs_{0.91}Bi_{0.085} Based New Multijunction Solar Cell and Effects of Solar Radiation and Sun Concentration on it", *International Conference: MicroCom*, IEEE Xplore, **2016, India**.
17. **Abu Kowsar**, Md Abul Hossion, Md Sofikul Islam, Afrina Sharmin and Zahid Hasan Mahmood," Analysis of theoretical efficiencies of GaInP₂/GaAs/Ge multijunction solar cell," *The Dhaka University Journal of Applied Science and Engineering*, Vol. 3, No.1 January, **2015**.
18. Syed Nazmus Sakib, Syeda Puspita Mouri, Zannatul Ferdous, **Abu Kowsar**, M. Shamim Kaiser, "Effect of different solar radiation on the efficiency of GaInP₂/GaAs/Ge based multijunction solar cell", 2nd International Conference on Electrical Information and Communication Technology (EICT), IEEE Xplore, **Bangladesh, 2015**.
19. **Abu Kowsar**, Md. Sofikul Islam, Kazi Rizwana Mehzabeen and, Zahid Hasan Mahmood," Solar Energy to Meet the Energy Crisis in Bangladesh", 10th *International Conference on Environmental Aspects of Bangladesh*, Pp 113-115, 2010, **Japan**
20. **Abu Kowsar**, Md. Sofikul Islam, Kazi Rizwana Mehzabeen and, Zahid Hasan Mahmood," Study on the Efficiency of the GaInP₂/GaAs/Ge Multijunction Solar Cell," *Proc. Of 10th International Conference on Environmental Aspects of Bangladesh*, Pp 116-119, September 4-8, 2010, **Japan**.
21. **Abu Kowsar**, Kazi Rizwana Mehzabeen, Md. Sofikul Islam and Zahid Hasan Mahmood," Determination of the theoretical efficiency of GaInP₂/GaAs/GaAs_{1-x}Bi_x multijunction solar cell," 10th *International conference on fiber optics and Photonics Photonics (Photonics-2010)*, 317_GP_Kowsar_Abu_01, **India**.

Patents: 2

1. **Abu Kowsar**, Nasifa Akter, Most. Hamida Khatun, Md. Abdul Jalil, Md. Moinuddin, Mst. Sarmina Yeasmin: '*Design and Development of a Low-Cost Electric Powerless Novel Green Refrigerator*', **WIPO Bangladesh Chapter** (Department of Patents, Designs and Trademarks (DPDT), Ministry of Industries, Bangladesh), Bangladesh Patent Serial No: 1006123, Accept date: 01.07.2019.
2. Md. Saidul Islam, Mashudur Rahaman, Md. Azizul Hoque, Sumon Chandra Debnath, Md. Sadequl Azam, Abu Kowsar, 'An Intelligent Self-adjusting Device for Indoor Light Control', **WIPO Bangladesh Chapter** (Department of Patents, Designs and Trademarks (DPDT), Ministry of Industries, Bangladesh), Bangladesh Patent Serial No: 1006512, Accept date: 24.10.2021.

Copyright: 4

3. **Abu Kowsar**, "Design development of a Large-Scale Solar Power Plant in Wetland", *Submitted to WIPO*, Bangladesh Copyright Office (*WIPO, Bangladesh Chapter*), Reg. No. L-2018479-00888, Date: 02.12.2018.
4. **Abu Kowsar**, "Development of a theoretical model for performance evaluation of III-V multijunction solar cell", Bangladesh Copyright Office (*WIPO, Bangladesh Chapter*), Reg. No. L 16687, Date: 08.01. 2019.
5. **Abu Kowsar**, "Development of a one-dimensional multijunction solar cell simulator: version-1 (MSCS-1D: V-1)" Bangladesh Copyright Office (*WIPO, Bangladesh Chapter*), Reg. No. L 16686, Date: 08.01. 2019.
6. **Abu Kowsar**, "Development of a one-dimensional multijunction solar cell simulator: version-2 (MSCS-1D: V2)" Submitted to *WIPO, Bangladesh Chapter*, (Bangladesh Copyright Office), 2021.

Industrial Process: 1

7. Syed Farid Uddin Farhad, **Abu Kowsar**, Nazmul Islam Tanvir, Dr. Most. Hosney Ara Begum, "Production of a low-cost portable rechargeable spin coater for thin-film solar cell fabrication", BCSIR Ref. No. 39.02.0000.043.37.195.18; date 24.04.2019.

Participation in Conference/Seminar:

1. Virtually participated in 48th IEEE Photovoltaic Specialist Conference (Virtual 48th PVSC), June 20-25, 2021, USA.
2. Virtually participated in 3rd International Conference on Energy and Power (ICEP-2021), November 18-20, 2021, Thailand
3. International Conference on Science and Technology for Celebrating the Birth Centenary of Bangabandhu (ICSTB-2021), 12-15 March, 2021, Bangladesh.
4. Virtually participated in 47th IEEE Photovoltaic Specialist Conference (47th PVSC), June-15-August 17, 2020, USA.
5. Virtually participated in an online meeting as a delegate from International Solar Alliance (ISA) countries with several global experts such as Dr. Seth Hubbard, Dr. Sarah Kurtz, Dr. Lawrence Kazmerski, Dr. Philippe Malbranche, Dr. Stefan Nowak, and Dr. Pierre Verlinden in the field of photovoltaics, arranged by International Solar Alliance (ISA) and 47th IEEE Photovoltaic Specialist Conference held on July 9, 2020.

Participation in Training: 10

1. Five days foreign training program on ‘**R&D management** for BCSIR scientists’, **CSIR-HRDC**, Gaziabad, Uttar Pradesh, **India**, January 2020
2. Five days program of ‘Bangladesh delegate meeting on collaborative research’ at CSIRO, Melbourne, Australia, During July, 2019
3. Training on operating system and maintenance of **Raman Spectroscopy**, **BCSIR Central Laboratory**, BCSIR, during June 2019.
4. Training on operating system and maintenance of **X-ray Diffraction (XRD)**, **BCSIR Laboratories Dhaka**, BCSIR, during June 2019.
5. Training on operating system and maintenance of **PL-Raman**, Center for excellence, IFRD, BCSIR, during March 2018.
6. Training on operating system and maintenance of **Wavelength Dispersive X-ray Fluorescence (WDXRF)**, IMMM, BCSIR Joypurhat, during March 2017.
7. **2nd Special Foundation Training Course (SFTC)**, Bangladesh Public Administration Training Centre (BPATC), during April-June, 2016.
8. Four days in-house training on **solar photovoltaic energy technology** at Thin-film Solar Cell Research Laboratory, IFRD, BCSIR during September, 2015.
9. Seven days in-house training on **Cadmium Telluride (CdTe)** solar cell fabrication by Closed Space Sublimation (CSS) machine at Thin-film Solar Cell Research Laboratory, IFRD, BCSIR during December, 2014.
10. Four days in-house training on **Sun Simulator (Solar Simulator) installation and application** at Thin-film solar cell research laboratory, IFRD, BCSIR during September, 2014.

Awards & Grants: 6

<i>March 2021</i>	Award: First Prize winner for presenting poster in International Conference on Science and Technology for Celebrating the Birth Centenary of Bangabandhu (ICSTB-2021),
<i>July 2020- June 2021</i>	Grant: Development of a high efficiency one dimensional multijunction solar cell simulator (MSCS-1d) for cost effective solar panel fabrication: Version-3 (MSCS-1d: V-3), Special Allocation from Ministry of Science and Technology, Government of Bangladesh. Ref. No.: GO Number: 39.00.0000.09.02.18-19/09/458/ID-57 Date: 14.01. 2019
<i>July 2018- June 2019</i>	Grant: Development of a high efficiency one dimensional multijunction solar cell simulator (MSCS-1d) for cost effective solar panel fabrication: Version-2 (MSCS-1d: V-2), Special Allocation from Ministry of Science and Technology, Government of Bangladesh. Ref. No.: GO Number: 39.00.0000.09.02.18-19/09/458/ID-57 Date: 14.01. 2019
<i>February 2019</i>	Award: Won the Best Poster Award (along with the scientist of Industrial Physics Division, BCSIR Labs Dhaka) from the National Conference on Physics-19.
<i>July 2017- June 2018</i>	Grant: Development of a high efficiency multijunction solar cell simulator for cost effective solar panel fabrication, Special Allocation from Ministry of Science and Technology, Government of Bangladesh. Ref. No.: 39.00.0000.09.06.79.2017/2 ; Date: 06.11.2017
<i>Oct 2016</i>	Award: Inter University Innovation Competition, Ministry of Power and Energy, Government of Bangladesh.

REFEREES

1. Mashudur Rahaman

Principal Scientific Officer

Institute of Fuel Research and Development (IFRD),

Bangladesh Council of Scientific and Industrial Research (BCSIR)

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Relation: Colleague

2. Dr. Syed Farid Uddin Farhad

Principal Scientific Officer

Industrial Physics Division (IPD), BCSIR Laboratories Dhaka

Bangladesh Council of Scientific and Industrial Research (BCSIR)

Dr. Qudrat-I-Khuda Road (New Elephant Road), Dhanmondi, Dhaka 1205

Mobile: +8801881755767 Email: sf1878@my.bristol.ac.uk

Relation: Colleague