

Dr. Muhammad Anisuzzaman Talukder

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1 EDUCATION

- **POSTDOCTORAL RESEARCH** (January 2016–August 2018)
Electronic and Electrical Engineering, University of Leeds, Leeds LS2 9JT, UK
Research Project: Terahertz ultra-short pulses from self-induced transparency modelocked quantum cascade lasers.
- **DOCTOR OF PHILOSOPHY** in Electrical Engineering (May 2010)
University of Maryland, MD 21250, USA
Dissertation Title: Analysis of self-induced transparency modelocking of quantum cascade lasers.
- **MASTER OF SCIENCE** in Electrical and Electronic Engineering (May 2004)
Bangladesh University of Engineering and Technology, Dhaka 1205, Bangladesh
Thesis Title: Analysis of self-phase modulation effect on optical WDM system with dispersion compensation.
- **BACHELOR OF SCIENCE** in Electrical and Electronic Engineering (May 2000)
Bangladesh University of Engineering and Technology, Dhaka 1205, Bangladesh
Thesis Title: Electrical load forecasting for Bangladesh.

2 PROFESSIONAL / RESEARCH EXPERIENCE

- **PROFESSOR** (July 2014 – Present)
ASSOCIATE PROFESSOR (July 2011 – July 2014)
ASSISTANT PROFESSOR (September 2004 – July 2011)
LECTURER (February 2001 – September 2004)
Electrical and Electronic Engineering (EEE), Bangladesh University of Engineering and Technology (BUET) – highest ranked University in Bangladesh (<http://www.buet.ac.bd>).
 - Teaching and supervising undergraduate and graduate courses and theses.
 - Taught postgraduate courses: EEE 6403 Quantum Phenomena in Nanostructures, EEE 6503 Laser Theory.
Taught undergraduate courses: EEE 461 Semiconductor and Nano Device, EEE 307 Electrical Properties of Materials, EEE 209 Engineering Electromagnetics, EEE 417 Digital and Satellite Communications, EEE 314 Telecommunication Engineering, EEE 305 Measurement and Instrumentation, EEE 263 Electronic Circuits and Devices, and EEE 269 Electrical Drives and Instrumentation.
- **FOUNDING DIRECTOR** (October 2020 – October 2024)
Research and Innovation Centre for Science and Engineering (RISE), BUET, Dhaka 1205.

- Attracted BDT 30+ Crore as research funds from national and international sources.
 - Made collaboration and signed MoUs with 100+ industries and universities within and outside the country.
 - Providing administrative and financial management support to all funded research projects at BUET.
 - Introduced and implemented several rounds of the RISE Internal Research Grant (BDT 2 Crore budget annually) and the RISE Student Research Grant (BDT 50 Lac budget annually).
 - Pursued the Bangladesh High Tech Park Authority and World Bank to establish an Innovation Hub at RISE, BUET. Hon’ble Prime Minister inaugurated the foundation stone in October 2023.
 - Established the UNESCO Chair on Industry Integration in Higher Education System at BUET - the first UNESCO Chair in Bangladesh.
 - Drafted an “Intellectual Property (IP) Policy of BUET” and got it approved by the BUET Syndicate.
- **UNESCO CHAIR HOLDER** (January 2024 – December 2027)
UNESCO Chair on Industry Integration in Higher Education System, established in RISE, BUET.
 - **INTERNATIONAL VISITING FACULTY** (July 2021 – 2022)
Chandigarh University, Mohali, Punjab, India.
 - **VISITING PROFESSOR** (June 2018 – May 2021)
VISITING ASSOCIATE PROFESSOR (January 2013 – December 2017)
VISITING ASSISTANT PROFESSOR (November 2010 – December 2012)
Computer Science and Electrical Engineering, University of Maryland (UMBC), USA.
 - Co-supervised Ph.D. students, pursued collaborative research projects, wrote joint research proposals, and published several research papers.
 - **MARIE CURIE INDIVIDUAL FELLOW** (October 2016 – September 2018)
School of Electronic and Electrical Engineering, University of Leeds, UK.
 - Worked on the proposed “Terahertz Ultra-Short Pulses from Self-Induced Transparency Modelocked Quantum Cascade Lasers (TERAULTRA)” project.
 - **RESEARCH FELLOW** (January 2016 – September 2016)
School of Electronic and Electrical Engineering, University of Leeds, UK.
 - Worked on European Commission funded “ULTRAQCL” project for ultra short pulse generation from THz quantum cascade lasers.
 - **HONORARY FELLOW** (September 2013 – August 2015)
Department of Electronic and Information Engineering (EIE), Hong Kong Polytechnic University, Hong Kong.
 - Rendered expert advice.
 - **CONTRACTUAL RESEARCH SCIENTIST** (February 2015 – June 2017)
Banpil Photonics, Inc., California, USA.
 - Collaborated in the development of multi-spectral image sensors.
 - **HONORARY VISITING ACADEMIC** (August 2013 – October 2013)
Department of Electrical and Electronic Engineering, School of Engineering and Mathematical Sciences, City, University London, UK.

- Collaborated in research, prepared collaborative research proposals for funding.
- **RESEARCH ASSISTANT** (June 2007 – May 2010)
Advisor: Professor Curtis R. Menyuk
Computer Science and Electrical Engineering, University of Maryland, USA.
 - Developed a simulation package for designing quantum cascade lasers (QCLs) and explored carrier transport and heat dissipation dynamics in QCLs.
 - Designed QCLs employing novel techniques for improved performances and proposed and demonstrated self-induced transparency modelocking of QCLs to generate ultra-short pulses.
 - Experienced in C++, MATLAB, and COMSOL programming tools; QCLs testing, mid-IR optoelectronic device characterization, and clean-room nanofabrication.
- **TEACHING ASSISTANT** (August 2006 – May 2007)
Computer Science and Electrical Engineering, University of Maryland, USA.
Assisted in theory and conducted laboratory of CMPE 314 Principles of Electronic Circuits.
- **SYSTEM ENGINEER** (October 2000 – February 2001)
Grameen Phone Limited – leading Mobile Phone operator in Bangladesh
(<http://www.grameenphone.com>)
 - Planned radio frequency of GSM network with the help of ASTRIX, assigned frequency and other parameters to the Base Transceiver Stations, and checked radio network quality and coverage using TEMS GSM 900/98 software.
- **PART-TIME FACULTY**
Stamford University Bangladesh, Bangladesh. (<http://www.stamforduniversity.edu.bd>) (October 2005 – February 2006)
Conducted course: Electrical Services Design.
Military Institute of Science and Technology, Bangladesh. (<http://www.mist-bd.org>) (February 2005 – October 2005)
Conducted courses: Numerical Techniques, Microprocessor and Interfacing. *Dhaka International University, Bangladesh* (<http://www.diu.net.bd>) (July 2001 – October 2003)
Conducted courses: Digital Techniques, Advanced Electronics, and Digital Signal Processing.

3 HONORS AND AWARDS

- Chairholder, UNESCO Chair on “Industry Integration in Higher Education System”, 2024.
- Recognition for Securing the Second Highest External Research Funding among BUET Teachers, 2021–2022.
- President, International Electrochemical Commission (IEC) - Bangladesh National Committee, 2019–2021.
- Marie Skłodowska-Curie Individual Fellowship 2015 under European Union’s Horizon 2020 to conduct research at the University of Leeds, UK for two years.
- Nominated as a High Level Delegate of Bangladesh Government to attend and present a plenary talk at the conference (South Asian Workshop on Optics and Photonics) to commemorate the International Year of Light by UNESCO in IIT, Guwahati, India, November 17–18, 2015.
- Early career travel award to attend The SIAM Conference on Nonlinear Waves and Coherent Structures (NW14), August 11-14, 2014, Cambridge, United Kingdom.

- Invitation and Full support to attend the Winter College on Optics: Fundamentals of Photonics – Theory, Devices and Applications, ICTP, Trieste, Italy, February 10–21, 2014.
- Honorary Fellow, Department of Electronic and Information Engineering, Hong Kong Polytechnic University, Hong Kong (2013-2015).
- Erasmus Mundus Strong-Ties Staff Level Mobility Scholarship 2013, City University London, UK.
- BAS (Bangladesh Academy of Sciences) - TWAS (The Academy of Sciences for the Developing World) Young Scientist Award, 2011. The award was conferred by the Hon'ble Prime Minister of Bangladesh.
- Dr. Fatema Rashid Best Paper Award, International Conference on Electrical and Computer Engineering (ICECE 2010), Dhaka, Bangladesh (2010).
- Significant Research Contributions Award 2008-2009, Mid-Infrared Technologies for Health and the Environment (MIRTHE), National Science Foundation Engineering Research Center (NSF-ERC), (2009).
- Best Ph. D. Research Award 2008-2009, Computer Science and Electrical Engineering, University of Maryland, Baltimore County, Baltimore, MD, USA (2009).
- Second Place Award in Graduate Student Poster Competition 2008, IEEE Baltimore and Washington-Northern Virginia Photonics Society Chapter, Baltimore, MD, USA (2008).
- Student Travel Grant, University of Maryland, Baltimore County, to attend and present a paper in the IEEE Lasers and Electro-Optics Society Annual Meeting, New Port Beach, CA, USA (2008).
- Position in Dean's List (1995–1999), Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology (BUET).
- Dhaka Education Board Scholarship – Talent Pool (1995–2000) for securing the 8th position in Higher Secondary Certificate Examination (~200,000 students participated).
- Dhaka Education Board Scholarship – Talent Pool (1991–1993) for securing 9th position in Secondary School Certificate Examination (~300,000 students participated).

4 RESEARCH GRANTS RECEIVED

1. **Title:** Cool Paints and Coating Solutions: A multi-dimensional applicable coating for vertical and horizontal substances
Organization offering the grant: Berger Paints Bangladesh Limited
Duration: 2024–2025
Fund: BDT 12,00,000.00
2. **Title:** Design of low-cost earth-abundant electrode incorporating FeOOH/MnO₂ electrocatalyst for efficient H₂ generation by water splitting
Organization offering the grant: Neural Semiconductors Limited, Bangladesh
Duration: 2024–2025
Fund: BDT 6,30,000.00
3. **Title:** Development of a virtual testing platform for electric vehicle batteries
Organization offering the grant: Poly Cables Industries Limited, Bangladesh
Duration: 2022–2024
Fund: BDT 50,00,000.00

4. **Title:** Terahertz ultra-short pulses from self-induced transparency modelocked quantum cascade lasers (ULTRATERA)
Organization offering the grant: European Commission under Horizon2020 and Marie-Curie Individual Fellowship
Duration: 2016–2018
Fund: €195,454.80
5. **Title:** Development of design software for infrared photodetectors
Organization offering the grant: Banpil Photonics Inc., CA, USA
Duration: 2016–2018
Fund: USD 8,000.00
6. **Title:** Plasmonic photovoltaics for next generation solar cells
Organization offering the grant: Ministry of Education, Bangladesh
Duration: 2013–2016
Fund: BDT 15,00,000.00
7. **Title:** Mid-Infrared sensors for monitoring greenhouse gases
Organization offering the grant: University Grants Commission, Bangladesh
Duration: 2012–2014
Fund: BDT 1,39,99,000.00
8. **Title:** Modeling gain dynamics of quantum cascade lasers
Organization offering the grant: MIRTHE, National Science Foundation-Engineering Research Center, USA
Duration: 2013–2014
Fund: USD 43,109.00
9. **Title:** Efficient photovoltaic energy conversion for solar cells toward sustainable future
Organization offering the grant: Ministry of Science and Technology, Bangladesh
Duration: 2012–2013
Fund: BDT 10,00,000.00
10. **Title:** Active modelocking of quantum cascade lasers
Organization offering the grant: National Science Foundation, USA
Duration: 2012–2013
Fund: USD 47,375.00
11. **Title:** Active modelocking of quantum cascade lasers and quantum coherence
Organization offering the grant: MIRTHE, National Science Foundation-Engineering Research Center, USA
Duration: 2011–2013
Fund: USD 93,317.00
12. **Title:** Modelocking of quantum cascade lasers and quantum coherence effects
Organization offering the grant: MIRTHE, National Science Foundation-Engineering Research Center, USA
Duration: 2010–2011
Fund: USD 50,717.00

5 PATENT

- C. R. Menyuk and M. A. Talukder, “Passively modelocked quantum cascade lasers,” (Awarded) United States Patent No.: US 7,940,818 B2, May 10, 2011.

- **M. A. Talukder** and C. R. Menyuk, “Ultra-short pulses from quantum cascade structures with distributed gain and absorption,” (Application filed) United States Patent Application No.: 62031225, Filing date: 31 July 2014.
- **M. A. Talukder**, P. Dean, E. H. Linfield, and A. G. Davies, “Quantum cascade laser,” (Application filed) United Kingdom Patent Application No.: 1814766.0, Filing date: 11 September 2018.

6 MAJOR ACTIVITIES AS THE RISE DIRECTOR

6.1 Supporting and Promoting Research

- *RISE Internal Research Grant*: Provided BDT 2 Crore per year from 2021 to BUET teachers as research grants on a competitive basis.
- *RISE Student Research Grant*: Provided BDT 50 Lac per year from 2022 to BUET undergraduate students as research grants on a competitive basis.
- *RISE Research Portal*: Developed an online portal with a personalized dashboard for teachers and students of BUET for research grant applications and management.
- *Incentive for Publication*: Developed an online platform for applying and processing incentives for publications by BUET teachers; evaluated 700+ applications as the committee chair.
- *Basic Research Grant*: Developed an online platform for applying and processing incentives for publications by BUET teachers; evaluated 250+ applications as the committee chair.
- *Administrative & Financial Management*: Provided administrative and financial support in implementing approximately 50 internally and externally funded research projects in each financial year since 2020.
- *Research Assistant Appointment*: Appointed 200+ research assistants in research projects.
- *Institutional Review Board*: Formed Institutional Review Board.

6.2 Collaboration with Industry, Academia, and Government

- Signed MoUs/agreements with more than 100 local and international industries and universities.
- Secured BDT 30+ Crore as research funding for BUET since January 2021.
- Established Bangladesh Energy and Power Research Laboratory at BUET (BEPRL-BUET) in collaboration with the Bangladesh Energy and Power Research Council (BEPRC), 2022.
- Established Walton Industrial Research Lab at BUET, 2024.

6.3 Supporting Incubation and Entrepreneurship

- *IP Policy of BUET*: Drafted the Intellectual Property Policy of BUET and got it approved by the BUET Syndicate in 2022.
- *Innovation Hub*: Established BUET Innovation Hub funded by the Bangladesh High Tech Park Authority and World Bank.
- *Building Cohort Program*: Started Innovation Hub Cohort Program for teaching incubation and encouraging and supporting entrepreneurship.

7 PRESENT AND PAST COLLABORATION

7.1 NATIONAL

- **Bangladesh Council of Scientific and Industrial Research (BCSIR):** With the *Institute of Energy Research and Development (Dr. Shahin Aziz)* in developing low-noise on-chip three-dimensional biological cell imaging system and efficient photoelectrochemical electrodes for green hydrogen generation.
- **Bangladesh Atomic Energy Commission (BAEC):** With the *Materials Science Division (Dr. Sheikh Manjura Hoque)* in developing efficient photoelectrochemical electrodes for green hydrogen generation.
- **Poly Cables Industries Limited:** In developing an artificial intelligence-powered virtual testing platform for electric vehicle batteries.
- **Berger Paints Bangladesh Limited:** In developing cool paints and coating solutions.

7.2 INTERNATIONAL

- **USA**

ACADEMIA: Department of Computer Science and Electrical Engineering, University of Maryland (UMBC) (*Prof. Curtis R. Menyuk, Prof. Anthony Johnson, Prof. Fow-Sen Choa*); Princeton University (*Prof. Claire Gmachl*); Johns Hopkins University (*Prof. Jacob Khurgin*).

INDUSTRY: Banpil Photonics Inc., CA (*Dr. Achyut K. Dutta*), US Army Research Laboratory (*Dr. Olukayode Okusaga*); Applied Physics and Photonics, Harrisburg, PA (*Dr. Anis Rahman*).

- **UK**

ACADEMIA: City, University London (*Prof. B. M. Azizur Rahman*); University of Leeds (*Dr. Paul Dean, Dr. Edmund H. Linfield, and Dr. A. Giles Davies*).

INDUSTRY: Technovative Solutions, Manchester Science Park Manchester, Manchester (*Dr. Fahim Chowdhury*); Precision Varionic International, Hillmead, Swindon (*Dr. Pufinji Obene*).

- **CANADA**

ACADEMIA: Queen's University, Kingston, Ontario (*Dr. Muhammad. Z. Alam*).

- **INDIA**

ACADEMIA: Velore Institute of Technology, Tamil Nadu (*Prof. Partha Sharathi Mallick and Dr. Rajesh Kaluri*); Indian Institute of Technology (IIT-ISM), Dhanbad (*Prof. Tanmoy Maity*); University of Engineering and Management, Kolkata (*Dr. Upal Chakraborty and Dr. Anupam Bhattacharya*).

INDUSTRY: Techno-India Group, Kolkata (*Dr. Sanku Bose*).

- **KOREA**

INDUSTRY: *Dr. Jaewon Lee*, Vice President, CONTEC, a spin-off company from KARI (Korea Aerospace Research Institute).

- **UNESCO**

- Industry integration in higher education system.
- Greening Education Partnership.

8 RESEARCH INTERESTS

Nanophotonics, biosensors, photovoltaics, plasmonic lasers, quantum cascade lasers, applications of mid-infrared technologies for health and environment, solar hydrogen generation, digitalization of battery testing, and energy modeling.

9 PUBLICATIONS

9.1 INTERNATIONAL REFEREED JOURNALS

1. A. A. Mamun and **M. A. Talukder**, “Techno-economic analysis of the direct solar conversion of carbon dioxide into renewable fuels,” *Energy Conversion and Management* **321**, 119038 (2024). <https://doi.org/10.1016/j.enconman.2024.119038>
2. A. A. Mamun, J. Karim, and **M. A. Talukder**, “Design and analysis of an efficient crystalline silicon-based thin-film solar cell inspired by *Chlamydomonas reinhardtii*,” *Solar Energy* **279**, 112777 (2024). <https://doi.org/10.1016/j.solener.2024.112777>
3. K. Sarkar and **M. A. Talukder**, “Structurally realistic carbide-derived carbon model in annealing molecular dynamics methodology with analytic bond-order potential” *Materials Advances* **5**, 5738–5748 (2024). <https://doi.org/10.1039/D4MA00171K>
4. M. Ahamed, M. N. Afroj, S. Shaid, and **M. A. Talukder**, “Wavelength selective beam-steering in a dual-mode multi-layer plasmonic laser,” *Optics Express* **32**, 19895–19909 (2024). <https://doi.org/10.1364/OE.518705>
5. M. M. Hossain and **M. A. Talukder**, “Tamm and surface plasmon hybrid modes in anisotropic graphene-photonic-crystal structure for hemoglobin detection,” *Optics Express* **32**, 14261–14275 (2024). <https://doi.org/10.1364/OE.514215>
6. A. A. Mamun, A. Billah, and **M. A. Talukder**, “Enhancing hydrogen evolution reaction using ultra-thin iridium monolayer on conventional electrodes in photoelectrochemical cells,” *International Journal of Hydrogen Energy* **59**, 982–990 (2024). <https://doi.org/10.1016/j.ijhydene.2024.02.156>
7. M. M. Hossain and **M. A. Talukder**, “Graphene nanostrip transverse magnetic dual-channel refractive index sensor,” *Optical Materials Express* **13**, 2168–2180 (2023). <https://doi.org/10.1364/OME.493380>.
8. A. A. Mamun, A. Billah, and **M. A. Talukder**, “Effects of activation overpotential in photoelectrochemical cells considering electrical and optical Configurations,” *Heliyon* **9**, e17191 (2023). <https://doi.org/10.1016/j.heliyon.2023.e17191>.
9. T. Ahmed, A. K. N. M. Haque, and **M. A. Talukder**, “Multiple features-based improved nanohole array plasmonic biosensor,” *IEEE Sensors Journal* **23**, 12743–12751 (2023). <https://doi.org/10.1109/JSEN.2023.3270439>.
10. M. M. Hossain and **M. A. Talukder**, “Graphene surface plasmon sensor for ultra-low-level SARS-CoV-2 detection,” *PLoS ONE* **18**(4): e0284812 (2023). <https://doi.org/10.1371/journal.pone.0284812>.
11. A. Mazumder, M. Mozammel, and **M. A. Talukder**, “Three-dimensional imaging of biological cells using surface plasmon coupled emission,” *Journal of Biomedical Optics* **27**(10), 106002 (2022), doi: <https://doi.org/10.1117/1.JBO.27.10.106002>.
12. **M. A. Talukder**, P. Dean, E. H. Linfield, and G. Davies, “Resonant two-photon terahertz quantum cascade laser,” *Optics Express* **30**, 31785–31794 (2022). <https://doi.org/10.1364/OE.467673>.
13. S.-E-Zumrat, S. Shahid, and **M. A. Talukder**, “Dual-wavelength hybrid Tamm plasmonic laser,” *Optics Express* **30**, 25234–25248 (2022). <https://doi.org/10.1364/OE.456249>.

14. S. Shahid, S.-E-Zumrat, and **M. A. Talukder**, “Merged lattice metal nanohole array based dual-mode plasmonic laser with ultra-low threshold,” *Nanoscale Advances* **4**, 801–813 (2022). <https://doi.org/10.1039/D1NA00402F>.
15. Z. Azad and **M. A. Talukder**, “Simultaneously surface- and edge-emitting plasmonic laser operating in the near-infrared region,” *Optics and Laser Technology* **146**, 107571 (2022). <https://doi.org/10.1016/j.optlastec.2021.107571>.
16. M. Hasan, D. Hasan, M. S. Islam, and **M. A. Talukder**, “Negative resonant modes in a hyperbolic metamaterial slot cavity,” *Applied Physics B* **127**, 89 (2021). <https://doi.org/10.1007/s00340-021-07631-8>.
17. M. M. Hossain and **M. A. Talukder**, “Gate-controlled graphene surface plasmon resonance glucose sensors,” *Optics Communications* **493**, 126994 (2021). <https://doi.org/10.1016/j.optcom.2021.126994>
18. Z. Azad, M. S. Islam, and **M. A. Talukder**, “Mode-resolved analysis of a planar multi-layer plasmonic nanolaser,” *Optics Communications* **482**, 126614 (2021). <https://doi.org/10.1016/j.optcom.2020.126614>.
19. M. M. Hossain and **M. A. Talukder**, “Optical magnetism in surface plasmon resonance based sensors for enhanced performance,” *Plasmonics* **16**, 581–588 (2021). <https://doi.org/10.1007/s11468-020-01316-2>.
20. **M. A. Talukder**, “Relating diffusion-weighted magnetic resonance imaging of brain white matter to cognitive processing-speed deficits in schizophrenia,” *Biomedical Physics and Engineering Express* **6**, 055007 (2020), <https://doi.org/10.1088/2057-1976/aba3ba>.
21. Z. Omair and **M. A. Talukder**, “Sensitivity analysis of gold nanorod biosensors for single molecule detection,” *Plasmonics* **14**, 1611–1619 (2019). <https://doi.org/10.1007/s11468-019-00946-5>.
22. **M. A. Talukder**, C. R. Menyuk, and Y. Kostov, “Distinguishing between whole cells and cell debris using surface plasmon coupled emission,” *Biomedical Optics Express* **9**, 1977–1991 (2018). <https://doi.org/10.1364/BOE.9.001977>.
23. Z. Ahmed and **M. A. Talukder**, “An efficient and directional optical Tamm state assisted plasmonic nanolaser with broad tuning range,” *Journal of Physics Communications* **2**, 045016 (2018). <https://doi.org/10.1088/2399-6528/aab7e4>.
24. A. Das and **M. A. Talukder**, “Theoretical analysis of bimetallic nanorod dimer biosensors for label-free molecule detection,” *AIP Advances* **8**, 025302 (2018). <https://doi.org/10.1063/1.5010902>.
25. S. Z. Uddin and **M. A. Talukder**, “Imaging of cell membrane topography using Tamm plasmon coupled emission,” *Biomedical Physics and Engineering Express* **3**, 065005 (2017). <https://doi.org/10.1088/2057-1976/aa881a>. The paper has been the feature article of the issue, among the 2017 highlights of the journal, and one of the “most read” articles of the journal.
26. S. Z. Uddin and **M. A. Talukder**, “Two-dimensional materials for improved resolution in total internal reflection fluorescence microscopy,” *Materials Research Express* **4**, 096203 (2017). <https://doi.org/10.1088/2053-1591/aa8a0f>.
27. M. Roy and **M. A. Talukder**, “Terahertz quantum cascade laser with an X-valley-based injector,” *Journal of Applied Physics* **121**, 133104 (2017). <https://doi.org/10.1063/1.4979692>.

28. S. E. J. Mahabadi, Y. Hu, **M. A. Talukder**, T. F. Carruthers, and C. R. Menyuk, “A comprehensive model of gain recovery due to unipolar electron transport after a short optical pulse in quantum cascade lasers,” *Journal of Applied Physics* **120**, 154502 (2016). <https://doi.org/10.1063/1.4964939>.
29. S. Z. Uddin, M. R. Tanvir, and **M. A. Talukder**, “A proposal and an analysis of an enhanced surface plasmon coupled emission structure for single molecule detection,” *Journal of Applied Physics* **119**, 204701 (2016). <https://doi.org/10.1063/1.4952576>.
30. K. Mashooq and **M. A. Talukder**, “Management of light absorption in extraordinary optical transmission based ultra-thin-film tandem solar cells,” *Journal of Applied Physics* **119**, 193101 (2016). <https://doi.org/10.1063/1.4949588>.
31. M. A. Awal, Z. Ahmed, and **M. A. Talukder**, “An efficient plasmonic photovoltaic structure with silicon strip-loaded geometry,” *Journal of Applied Physics* **117**, 063109 (2015). <https://doi.org/10.1063/1.4907873>.
32. D. Guo, H. Cai, **M. A. Talukder**, X. Chen, A. M. Johnson, J. B. Khurgin, and F.-S. Choa, “Near-infrared induced optical quenching effects on mid-infrared quantum cascade lasers,” *Applied Physics Letters* **104**, 251102 (2014). <https://doi.org/10.1063/1.4884605>.
33. **M. A. Talukder** and C. R. Menyuk, “Quantum coherent saturable absorption for mid-infrared ultra-short pulses,” *Optics Express* **22**, 15608 (2014). <https://doi.org/10.1364/OE.22.015608>.
34. **M. A. Talukder** and C. R. Menyuk, “Calculation of microscopic parameters of a self-induced transparency modelocked quantum cascade laser,” *Optics Communications* **295**, 115 (2013). <https://doi.org/10.1016/j.optcom.2012.12.094>.
35. S. S. Shimu, A. Docherty, **M. A. Talukder**, and C. R. Menyuk, “Suppression of spatial hole burning and pulse stabilization for actively modelocked quantum cascade lasers using quantum coherent absorption,” *Journal of Applied Physics* **113**, 053106 (2013). <https://doi.org/10.1063/1.4790145>.
36. **M. A. Talukder** and C. R. Menyuk, “Temperature-dependent coherent carrier transport in quantum cascade lasers,” *New Journal of Physics* **13**, 083027 (2011). <https://doi.org/10.1088/1367-2630/13/8/083027>.
37. **M. A. Talukder**, “Modeling of gain recovery of quantum cascade lasers,” *Journal of Applied Physics* **109**, 033104 (2011) (also published in March 2011 issue of *Virtual Journal of Ultrafast Science*). <https://doi.org/10.1063/1.3544201>.
38. **M. A. Talukder** and C. R. Menyuk, “Self-induced transparency modelocking of quantum cascade lasers in the presence of saturable nonlinearity and group velocity dispersion,” *Optics Express* **18**, 5639 (2010). <https://doi.org/10.1364/OE.18.005639>.
39. **M. A. Talukder** and C. R. Menyuk, “Effects of backward-propagating waves and lumped mirror losses on self-induced transparency in quantum cascade lasers,” *Applied Physics Letters* **95**, 071109 (2009). <https://doi.org/10.1063/1.3206741>.
40. **M. A. Talukder** and C. R. Menyuk, “Analytical and computational study of self-induced transparency modelocking in quantum cascade lasers,” *Physical Review A* **79**, 063841 (2009). <https://doi.org/10.1103/PhysRevA.79.063841>.
41. C. R. Menyuk and **M. A. Talukder**, “Self-induced transparency modelocking of quantum cascade lasers,” *Physical Review Letters* **102**, 023903 (2009) (also published in February 2009 issue of *Virtual Journal of Ultrafast Science*). <https://doi.org/10.1103/PhysRevLett.102.023903>.

42. **M. A. Talukder** and M. N. Islam, "A long-haul wavelength division multiplexed system using standard single-mode fiber in presence of self-phase modulation," *Optik - International Journal for Light and Electron Optics* **120**, 356 (2009). <https://doi.org/10.1016/j.ijleo.2007.02.013>.
43. **M. A. Talukder** and M. N. Islam, "Performance of bi-end compensation in a wavelength-division multiplexed system considering the effect of self phase modulation," *Optical Engineering* **44**, 115005 (2005). <https://doi.org/10.1117/1.2128631>.

9.2 JOURNAL MANUSCRIPTS UNDER REVIEW

1. M. Momtaj and **M. A. Talukder**, "Toward low-noise, on-chip three-dimensional biological cell imaging based on surface plasmon coupled emission," under review, *Optics Express* (2024).
2. **M. A. Talukder**, "Time- and frequency-resolved dynamics of a two-photon terahertz quantum cascade laser," *Results in Optics*, under review (2024).
3. M. Kundu, A. Ghosh, A. J. B. Iqbal, and **M. A. Talukder**, "Theoretical investigation of slow gain recovery of quantum cascade lasers observed in pump-probe experiment," *Optical and Quantum Electronics*, under review (2024).
4. J. Tasnim, A. Rahman, **M. A. Talukder**, and M. K. Hasan, "Generalized real-time state of health prediction of lithium-ion batteries using energy discrepancy aware preprocessing and simulation model with multi-loss attention guided multi-Bi-ISTM network," under review, *Applied Energy* (2024).
5. S. Shahid and **M. A. Talukder**, "Beyond periodicity: Tailoring Tamm resonances in plasmonic nanohole arrays for multimodal lasing," *New Journal of Physics*, under review (2024).
6. A. Rahman and **M. A. Talukder**, "Development of a deep learning-based virtual testing system for electric vehicle batteries," under preparation (2024).
7. A. A. Mamun, A. H. Chowdhury, A. Billah, J. Karim, A. O. Hussain, F. Rahman, and **M. A. Talukder**, "Review of strategies for enhancing transitional metal oxides-based photoelectrochemical water splitting performances," *RSC Applied Interfaces*, under review (2024).
8. K. Sarkar and **M. A. Talukder**, "Impact of microscopic atomic structure of realistic nanoporous CDC electrode on capacitance of electrochemical capacitor with room temperature ionic liquid electrolyte," under preparation (2024).

9.3 CONFERENCE PROCEEDINGS

1. A. Demic, T. B. Gill, **M. A. Talukder**, D. Indjin, P. Dean, "General Maxwell-Bloch modelling of self-induced transparency in N -level atom," *International Workshop on Computational Nanotechnology*, Barcelona, Spain (2023).
2. **M. A. Talukder**, "Photovoltaic cells based on plasmonic structures," (Invited) *Micro- and Nanotechnology Sensors, Systems, and Applications IX in SPIE Commercial + Scientific Sensing and Imaging*, Anaheim, CA, USA (2017).
3. **M. A. Talukder**, "Ultra-short pulses from quantum cascade lasers for terahertz time domain spectroscopy," (Invited) *Image Sensing Technologies: Materials, Devices, Systems, and Applications IV in SPIE Commercial + Scientific Sensing and Imaging*, Anaheim, CA, USA (2017).
4. K. Mashooq and **M. A. Talukder**, "Effects of intermediate metal layer in ultra-thin-film tandem solar cells," *Photonics West*, San Francisco, CA, USA (2017).

5. **M. A. Talukder**, C. R. Menyuk, and Y. Kostov, "Distinguishing between whole cells and cell debris using surface plasmon coupled emission," Photonics West, San Francisco, CA, USA (2017).
6. S. Z. Uddin and **M. A. Talukder**, "Reduction of detection volume in total internal reflection fluorescence microscopy using graphene," 9th International Conference on Electrical and Computer Engineering (ICECE), Dhaka, Bangladesh (2016).
7. **M. A. Talukder**, P. Dean, E. Linfield, A. G. Davies, "Cavity-induced slow gain recovery in pump-probe experiments of quantum cascade lasers," International Quantum Cascade Lasers School and Workshop (IQCLSW), Cambridge, UK (2016).
8. S. Z. Uddin, M. R. Tanvir, S. Hassan, and **M. A. Talukder**, "Surface plasmon coupled emission enhancement with nanoparticles in the metal layer," IEEE International Conference on Photonics (ICP), Sarawak, Malaysia (2016).
9. S. Hassan and **M. A. Talukder**, "Quantum cascade thermo photovoltaic structures for broadband energy conversion," IEEE International Conference on Photonics (ICP), Sarawak, Malaysia (2016).
10. S. Hassan and **M. A. Talukder**, "Increased radiation absorption in thermophotovoltaic quantum cascade structures," IEEE International Conference on Telecommunication and Photonics (ICTP), Dhaka, Bangladesh (2015).
11. M. R. K. Rachi, N. Jawad, and **M. A. Talukder**, "Enhancement of light absorption in a thin-film tandem solar cell with an intermediate layer of metal strips," IEEE Photonics Conference (IPC 2015), Virginia, USA (2015).
12. S. Z. Uddin, M. R. Tanvir, and **M. A. Talukder**, "Surface plasmon coupled emission with fluorescent molecules as broadband dipoles," IEEE Photonics Conference (IPC 2015), Virginia, USA (2015).
13. M. S. H. Sohel, A. F. M. S. Haq, and **M. A. Talukder**, "Design and simulation of three wavelength terahertz GaN quantum cascade laser," 8th International Conference on Electrical and Computer Engineering (ICECE), Dhaka, Bangladesh (2014).
14. M A Awal, Zabir Ahmed, and **M. A. Talukder**, "Semi-analytical model for enhanced surface plasmon polaritons in a corrugated interface," 8th International Conference on Electrical and Computer Engineering (ICECE), Dhaka, Bangladesh (2014).
15. **M. A. Talukder** and C. R. Menyuk, "Suppression of spatial hole-burning and sub-picosecond pulses from two-section quantum cascade lasers," IEEE Photonics Conference (IPC 2014), San Diego, CA, USA (2014).
16. G. M. I. Hossain and **M. A. Talukder**, "Light management in tandem solar cell with intermediate plasmonic electrode," IEEE Photonics Conference (IPC 2014), San Diego, CA, USA (2014).
17. **M. A. Talukder** and C. R. Menyuk, "Modelocking quantum cascade lasers using quantum coherent saturable absorption," SIAM Conference on Nonlinear Waves and Coherent Structures, University of Cambridge, UK (2014).
18. C. R. Menyuk and **M. A. Talukder**, "Solitons, self-induced transparency, and quantum cascade lasers," SIAM Conference on Nonlinear Waves and Coherent Structures, University of Cambridge (2014).
19. **M. A. Talukder**, "Quantum coherent saturable absorption for mid-infrared ultra-short pulses," Winter College on Optics: Fundamentals of Photonics - Theory, Devices and Applications, ICTP, Trieste, Italy (2014).

20. S. N. Sourav, A. F. M. S. Haq, and **M. A. Talukder**, “Wideband photovoltaic energy conversion using group III-nitrides,” International Conference on Advances in Electrical Engineering (ICAEE), Dhaka, Bangladesh (2013).
21. **M. A. Talukder**, “Ultra-short pulses from quantum cascade structures with distributed gain and absorption,” IEEE Photonics Conference (IPC 2013), Washington, USA (2013).
22. M. Ahmed and **M. A. Talukder**, “Quantum cascade structures for efficient thermo-photovoltaic energy conversion,” Photonics Global Conference (PGC 2012), Singapore (2012).
23. R. Faria, O. Hassan, F. Hayee, M. S. H. Sohel, A. Ahmed, and **M. A. Talukder**, “Study of design-dependent electroluminescence linewidth of quantum cascade lasers,” Photonics Global Conference (PGC 2012), Singapore (2012).
24. A. Ahmed, O. Hassan, M. S. H. Sohel, F. Hayee, R. Faria, and **M. A. Talukder**, “Quantum cascade laser wavelength tuning due to temperature-dependent index of refraction,” Photonics Global Conference (PGC 2012), Singapore (2012).
25. **M. A. Talukder**, “Gain recovery dynamics of quantum cascade lasers,” Photonics Global Conference (PGC 2012), Singapore (2012).
26. A. Ahmed, O. Hassan, M. S. H. Sohel, F. Hayee, R. Faria, and **M. A. Talukder**, “Short pulse dynamics in quantum cascade lasers,” 7th International Conference on Electrical and Computer Engineering (ICECE 2012), Dhaka, Bangladesh (2012).
27. M. Ahmed and **M. A. Talukder**, “Intersubband transition based efficient photovoltaic energy conversion,” 7th International Conference on Electrical and Computer Engineering (ICECE 2012), Dhaka, Bangladesh (2012).
28. O. Hassan, R. Faria, F. Hayee, M. S. H. Sohel, A. Ahmed, and **M. A. Talukder**, “Bias dependence of gain spectrum and output emission characteristics of two phonon resonance design quantum cascade lasers,” 7th International Conference on Electrical and Computer Engineering (ICECE 2012), Dhaka, Bangladesh (2012).
29. F. Hayee, R. Faria, O. Hassan, M. S. H. Sohel, A. Ahmed, and **M. A. Talukder**, “Bias-dependent intersubband electroluminescence linewidth of quantum cascade lasers,” 7th International Conference on Electrical and Computer Engineering (ICECE 2012), Dhaka, Bangladesh (2012).
30. M. S. H. Sohel, O. Hassan, A. Ahmed, F. Hayee, R. Faria, and **M. A. Talukder**, “Effect of temperature on quantum cascade laser emission as a function of cavity length,” 7th International Conference on Electrical and Computer Engineering (ICECE 2012), Dhaka, Bangladesh (2012).
31. S. S. Shimu, A. Docherty, **M. A. Talukder**, and C. R. Menyuk, “Theoretical demonstration of stabilization of active modelocking in quantum cascade lasers with quantum coherent absorption,” IEEE Photonics Conference (IPC 2012), California, USA (2012).
32. S. S. Shimu, A. Docherty, **M. A. Talukder**, and C. R. Menyuk, “Stabilization of active modelocking in quantum cascade lasers with quantum coherent absorption,” MIRTHE-IRON-SensorCAT Virtual Conference, Princeton University, Princeton, USA (2012).
33. **M. A. Talukder** and C. R. Menyuk, “Temperature-sensitive gain recovery dynamics of quantum cascade lasers,” International Conference on Intersubband Transitions in Quantum Wells (ITQW 2011), Sardinia, Italy (2011).
34. S. S. Shimu, A. Docherty, **M. A. Talukder**, and C. R. Menyuk, “Investigation of methods for improving the stability of active modelocking in quantum cascade lasers,” Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, Princeton University, Princeton, USA (2011).

35. **M. A. Talukder** and C. R. Menyuk, "Comprehensive quantum cascade lasers carrier transport modeling," MIRTHE NSF Site Visit, Princeton University, Princeton, USA (2011).
36. **M. A. Talukder** and C. R. Menyuk, "Gain to absorption ratio of self-induced transparency modelocked quantum cascade lasers," Conference on Lasers and Electro-Optics (CLEO 2011), Baltimore, USA (2011).
37. **M. A. Talukder** and C. R. Menyuk, "Inefficient coherent carrier transport in quantum cascade lasers at high temperature," Conference on Lasers and Electro-Optics (CLEO 2011), Baltimore, USA (2011).
38. **M. A. Talukder** and C. R. Menyuk, "Quantum coherence times in quantum cascade lasers," MIRTHE-IRON-SensorCAT Virtual Conference, Princeton University, Princeton, USA (2011).
39. **M. A. Talukder**, "Gain recovery modeling of quantum cascade lasers," International Conference on Electrical and Computer Engineering (ICECE 2010), Dhaka, Bangladesh (2010) (won the best paper award).
40. **M. A. Talukder**, "Role of coherence time on carrier transport of quantum cascade lasers," Photonics Global Conference (PGC 2010), Singapore (2010).
41. C. R. Menyuk and **M. A. Talukder**, "A completely new way to make ultra-short pulses at mid-infrared wavelengths," Computer Science and Electrical Engineering Research Review, University of Maryland Baltimore County (2010).
42. **M. A. Talukder**, "A novel approach to create ultra-short mid-IR pulses," Graduate Research Conference (GRC 2010), University of Maryland, Baltimore County, Baltimore, MD, USA (2010).
43. C. R. Menyuk and **M. A. Talukder**, "Self-induced transparency modelocking in quantum cascade lasers," SIAM Conference on Nonlinear Waves and Coherent Structures (SIAM-NW10), Philadelphia, Pennsylvania, USA (2010).
44. **M. A. Talukder** and C. R. Menyuk, "Self-induced transparency modelocking with saturable nonlinearity and group velocity dispersion," Conference on Lasers and Electro-Optics (CLEO 2010), San Jose, CA (2010).
45. **M. A. Talukder** and C. R. Menyuk, "Saturable nonlinearity and group velocity dispersion limits for self-induced transparency modelocking," Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2010).
46. **M. A. Talukder** and C. R. Menyuk, "Stability limits of self-induced transparency modelocking of quantum cascade lasers in bi-directional propagation," International Conference on Intersubband Transitions in Quantum Wells (ITQW 2009), Montreal, Canada (2009).
47. **M. A. Talukder** and C. R. Menyuk, "Carrier transport through quantum cascade lasers: Effects of coherence times," Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, New York, USA (2009).
48. **M. A. Talukder** and C. R. Menyuk, "Quantum cascade laser structures for self-induced transparency modelocking," Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2009).
49. **M. A. Talukder** and C. R. Menyuk, "Stability in self-induced transparency modelocking as system parameters vary," IEEE Photonics Society Annual Meeting, New Port Beach, CA, USA (2008).

50. **M. A. Talukder** and C. R. Menyuk, “Quantum cascade laser structures for self-induced transparency modelocking,” International Quantum Cascade Lasers School and Workshop, Monte Verita, Switzerland (2008).
51. **M. A. Talukder** and C. R. Menyuk, “Stability of self-induced transparency modelocking in quantum cascade lasers,” Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, Johns Hopkins University, Baltimore, USA (2008).
52. **M. A. Talukder**, C. R. Menyuk, “Modelocking in quantum cascade lasers using self-induced transparency,” IEEE Photonics Society Annual Poster Competition, Baltimore and Washington-Northern Virginia Chapter, Baltimore, USA (2008) (won the 1st runner-up prize).
53. **M. A. Talukder**, F.-S. Choa, C. R. Menyuk, K. J. Franz, S. S. Howard, and C. F. Gmachl, “Novel heat removal waveguide structure for high performance quantum cascade lasers,” Conference on Lasers and Electro-Optics (CLEO 2008), San Jose, CA, USA (2008).
54. **M. A. Talukder**, F.-S. Choa, and C. R. Menyuk, “High power quantum cascade laser with buried heterostructure,” Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2008).
55. **M. A. Talukder**, C. R. Menyuk, and F.-S. Choa, “Comprehensive quantum cascade laser model and applications,” Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2008).
56. **M. A. Talukder**, Fow-Sen Choa, and C. R. Menyuk, “Structure design for quantum cascade laser core temperature reduction,” Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, Princeton University, Princeton, NJ, USA (2007).
57. **M. A. Talukder** and M. N. Islam, “Effect of self-phase modulation on optical communication system in presence of dispersion compensation,” International Conference on Electrical and Computer Engineering (ICECE 2004), Dhaka, Bangladesh (2004).
58. **M. A. Talukder** and M. N. Islam, “Dependence of self-phase modulation impairments on input pulse shape over a dispersion-compensated transmission link using standard single mode fiber,” IEEE 8th International Multitopic Conference (INMIC 2004), Lahore, Pakistan (2004).

9.4 OTHERS

1. **M. A. Talukder**, C. R. Menyuk, and Fow-Sen Choa, “A comprehensive quantum cascade laser model,” <http://www.umbc.edu/photronics/software>.
2. **M. A. Talukder**, C. R. Menyuk, and Fow-Sen Choa, “Quantum cascade laser (QCL) model simulation package,” <http://www.umbc.edu/photronics/software>.

10 PRESENTATIONS

10.1 KEYNOTE

1. “Nikola Tesla: The Futurist Engineer,” organized by the BSM Novotheatre, Dhaka, 29 June 2024.
2. “Alternate Sources of Energy: What Future Bangladesh Offers?” organized by the Ministry of Public Administration, Government of Bangladesh, 4 June 2024.
3. “A Roadmap for University-based IP Management System,” National Conference on Intellectual Property and Commercialization 2024 (NCIPC 2024), Dhaka, May 15, 2024.

4. “Smart Citizens for Smart Bangladesh: Areas for Building Rural Skilled Populations,” organized by the Bangladesh Academy for Rural Development (BARD), Cumilla, 11 March 2024.
5. “University-Industry Collaboration to meet 4IR and SDG,” organized by the Faculty of Engineering, University of Rajshahi, 2 September 2023.
6. “Planning, implementation, and Documentation of a research project,” Khulna University, Organized by the IQAC and Research and Innovation Centre of Khulna University, March 20, 2023.
7. “Increasing Awareness on Predatory Academic Practices,” National Young Academy of Bangladesh Seminar, 22 February 2022.
8. “Nanophotonics for enhanced photovoltaics, biosensing, and microscopy,” ICEECC 2019, India.

10.2 INVITED

1. “IP practices in BUET,” at the Webinar on “IP Management at Tertiary Educational Institutions: Malaysia and Bangladesh” organized under the University Innovation Hub Program by the Bangladesh High Tech Park Authority of the ICT Division, 20 July 2024.
2. “RISE in BUET – Trickle Down of Advanced Research to Undergraduate Curriculum,” at the National Symposium on “Transforming Education for the Industry: Engineer’s Perspective in Achieving Vision 2041,” organized by the Board of Accreditation for Engineering and Technical Education, Dhaka, Bangladesh, April 20, 2024.
3. “Fostering Industry-Academia Collaboration,” Teachers’ Appreciation Workshop, organized by the Directorate of Continuing Education, BUET, March 19, 2024.
4. “Intellectual Property Policy of BUET,” Japan-Sweden-Bangladesh Joint Seminar of IP Policy organized by the Osaka University, Japan, March 2, 2023.
5. “Nanophotonics for enhanced photovoltaics, biosensing, and microscopy,” International Faculty Development Program, Chandigarh University, India, July 5–10, 2021.
6. “Plasmonic photovoltaics, biosensing, and microscopy,” (Invited) in University of California Irvine, CA, USA (2017).
7. “Photovoltaic cells based on plasmonic structures,” (Invited) SPIE Commercial + Scientific Sensing and Imaging, Anaheim, CA, USA (2017).
8. “Ultra-short pulses from quantum cascade lasers for terahertz time domain spectroscopy,” (Invited) SPIE Commercial + Scientific Sensing and Imaging, Anaheim, CA, USA (2017).
9. “Literary contents for conducting high impact research in engineering: challenges and prospects in the context of Bangladesh,” (Invited) in Seminar Series organized by the Library of BUET (2015).
10. “Mid-infrared light for health and environment,” (Invited) in the South Asian Workshop on Optics and Photonics, Indian Institute of Technology Guwahati, India (2015).
11. “Creating and controlling shades of light for health and environment,” (Invited) in the International Conference on Material Chemistry, Sylhet, Bangladesh (2014).
12. “Modelocking quantum cascade lasers using quantum coherent saturable absorption” (Invited) in the SIAM Conference on Nonlinear Waves and Coherent Structures, University of Cambridge, UK (2014).

13. “The quantum coherence and a novel approach to create ultra-short pulses in quantum cascade lasers” (Invited) in a Seminar organized by BUET and IEEE Bangladesh Section, Dhaka (2013).
14. “Quantum coherence and gain recovery dynamics in quantum cascade lasers” (Invited) in a Seminar organized by Princeton University, Princeton, USA (2010).
15. “Quantum cascade lasers: The ultra-fast dynamics” (Invited) in a Seminar organized by BUET and IEEE Electron Devices Society – Bangladesh Chapter, Dhaka (2009).
16. “Quantum cascade lasers: The art of band-structure engineering” (Invited) in a Seminar organized by East-West University Bangladesh and IEEE Electron Devices Society – Bangladesh Chapter, Dhaka (2009).
17. “Quantum cascade lasers, modelocking, and self-induced transparency” (Invited) in Electrical Engineering Graduate Seminar, University of Maryland, Baltimore County, Baltimore, MD, USA (2009).
18. “Analytical and computational study of self-induced transparency mode-locking in quantum cascade lasers” (Invited) in Computer Science and Electrical Engineering Research Review, University of Maryland, Baltimore County, Baltimore, MD, USA (2009).
19. “Quantum cascade laser: Design and numerical characterization” (Invited) in Electrical Engineering Graduate Seminar, University of Maryland, Baltimore County, Baltimore, MD, USA (2008).

10.3 CONTRIBUTED

1. “Quantum coherent saturable absorption for mid-infrared ultra-short pulses” in the Winter College on Optics: Fundamentals of Photonics - Theory, Devices and Applications, ICTP, Trieste, Italy (2014).
2. “Ultra-short pulses from quantum cascade structures with distributed gain and absorption” in the IEEE Photonics Conference (IPC 2013), Washington, USA (2013).
3. “Gain recovery dynamics of quantum cascade lasers” in the Photonics Global Conference (PGC 2012), Singapore (2012).
4. “Quantum cascade structures for efficient thermo-photovoltaic energy conversion” in the Photonics Global Conference (PGC 2012), Singapore (2012).
5. “Theoretical demonstration of stabilization of active modelocking in quantum cascade lasers with quantum coherent absorption” in the IEEE Photonics Conference (IPC 2012), California, USA (2012).
6. “Temperature-sensitive gain recovery dynamics of quantum cascade lasers” in the International Conference on Intersubband Transitions in Quantum Wells (ITQW 2011), Sardinia, Italy (2011).
7. “Gain to absorption ratio of self-induced transparency modelocked quantum cascade lasers” in the Conference on Lasers and Electro-Optics (CLEO 2011), Baltimore, USA (2011).
8. “Inefficient coherent carrier transport in quantum cascade lasers at high temperature” in the Conference on Lasers and Electro-Optics (CLEO 2011), Baltimore, USA (2011).
9. “Gain recovery modeling of quantum cascade lasers” in the International Conference on Electrical and Computer Engineering (ICECE 2010), Dhaka, Bangladesh (2010) (won the best paper award).
10. “A novel approach to create ultra-short mid-IR pulses” in the Graduate Research Conference (GRC 2010), University of Maryland, Baltimore County, Baltimore, MD, USA (2010).

11. "Self-induced transparency modelocking with saturable nonlinearity and group velocity dispersion" in the Conference on Lasers and Electro-Optics (CLEO 2010), San Jose, CA (2010).
12. "Saturable nonlinearity and group velocity dispersion limits for self-induced transparency modelocking" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2010).
13. "Stability limits of self-induced transparency modelocking of quantum cascade lasers in bi-directional propagation" in the International Conference on Intersubband Transitions in Quantum Wells (ITQW 2009), Montreal, Canada (2009).
14. "Carrier transport through quantum cascade lasers: Effects of coherence times" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, New York, USA (2009).
15. "Quantum cascade laser structures for self-induced transparency modelocking" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2009).
16. "Stability in self-induced transparency modelocking as system parameters vary" in the IEEE Photonics Society Annual Meeting, New Port Beach, CA, USA (2008).
17. "Quantum cascade laser structures for self-induced transparency modelocking" in the International Quantum Cascade Lasers School and Workshop, Monte Verita, Switzerland (2008).
18. "Stability of self-induced transparency modelocking in quantum cascade lasers" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, Johns Hopkins University, Baltimore, USA (2008).
19. "Modelocking in quantum cascade lasers using self-induced transparency" in the IEEE Photonics Society Annual Poster Competition, Baltimore and Washington-Northern Virginia Chapter, Baltimore, USA (2008) (won the 1st runner-up prize).
20. "Novel heat removal waveguide structure for high performance quantum cascade lasers" in the Conference on Lasers and Electro-Optics (CLEO 2008), San Jose, CA, USA (2008).
21. "High power quantum cascade laser with buried heterostructure" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2008).
22. "Comprehensive quantum cascade laser model and applications" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) National Science Foundation (NSF) Site Visit, Princeton University, Princeton, NJ, USA (2008).
23. "Structure design for quantum cascade laser core temperature reduction" in the Mid-Infrared Technologies for Health and the Environment (MIRTHE) Summer Workshop, Princeton University, Princeton, NJ, USA (2007).
24. "Effect of self-phase modulation on optical communication system in presence of dispersion compensation" in the International Conference on Electrical and Computer Engineering (ICECE 2004), Dhaka, Bangladesh (2004).
25. "Dependence of self-phase modulation impairments on input pulse shape over a dispersion-compensated transmission link using standard single mode fiber" in the IEEE 8th International Multitopic Conference (INMIC 2004), Lahore, Pakistan (2004).

11 POSTGRADUATE THESIS SUPERVISION

11.1 PhD

- “Design and analysis of graphene surface plasmon biosensors,” defended by Md. Mahbub Hossain (2022).

11.2 MSc

1. Design and analysis of a low-noise on-chip three-dimensional plasmonic biological cell imaging system,” to be defended by Maliha Momtaj (December 2024).
2. “Design and analysis of high energy nanoporous carbon electrode based supercapacitor,” to be defended by Koushik Sarkar (December 2024).
3. “Design and analysis of efficient and tunable plasmonic lasers with directional radiation,” defended by Zabir Ahmed (August 2016).
4. “Analysis of bimetallic nanorod dimer biosensors for label-free molecule detection,” defended by Avijit Das (August 2016).
5. “Analysis of dispersion-dependent spectral response of mid-infrared InGaAs/GaAsSb photodetectors,” defended by Maruf Ahmed (May 2016).
6. “Design and analysis of ultra-broadband gain medium and waveguide structure for terahertz emission,” defended by Md. Shahadat Hasan Sohel (March 2015).
7. “Study of dynamics of mid-infrared quantum cascade lasers pumped by near-infrared light,” defended by Fariah Hayee (August 2014).
8. “Study of light trapping in a tandem plasmonic solar cell,” defended by Golam Md. Imran Hossain (July 2014).
9. “Analysis of a multi-Color widely tunable quantum cascade laser with multi-segment cavity,” defended by Orchi Hassan (July 2014).
10. “Analysis of temperature dependence of nitride-based quantum cascade detectors,” defended by A. F. M. Saniul Haq (July 2014).
11. “Analysis of diffraction grating-induced distributed feedback for stable single-mode quantum cascade lasers,” defended by Asif Ahmed (May 2014).

12 CONTRIBUTION TO GOVERNMENT ORGANIZATIONS

12.1 MINISTRY OF EDUCATION

- National Steering Committee Member of the Grant for Advanced Research in Education (GARE), 2023–present.
- Evaluation and Monitoring Committee Member of the Grant for Advanced Research in Education (GARE), 2022–present.

12.2 MINISTRY OF SCIENCE & TECHNOLOGY

- Focal Point for BUET for the National Science and Technology Fellowship for students and Research & Development Grants for Teachers, February 2024–present.
- Evaluation Committee Member (Physical Science Group) of the Special Allocation for Research, 2021–present.
- Evaluation Committee Member for Research Grant, Bangladesh Council of Scientific and Industrial Research (BCSIR), 2021, 2022, and 2023.

12.3 MINISTRY OF COMMERCE

- “ICT Industry, Digital Commerce, Freelancing, Entrepreneurship and Start-up” Technical Committee Member for the Subcommittee of the “Smart Bangladesh Taskforce,” Government of Bangladesh, October 2023–present.
- “ICT Industry, Digital Commerce, Freelancing, Entrepreneurship and Start-up” Subcommittee Member of the “Smart Bangladesh Taskforce,” Government of Bangladesh, September 2023–present.

12.4 MINISTRY OF INDUSTRY

- BSM Industry Award 2022 Evaluation Committee Member, 2023.
- Electrical and Electronics Divisional Committee (EEDC) Member of Bangladesh Standards and Testing Institutions (BSTI), 2019–2021.
- Recruitment and Evaluation Committee Member, Bangladesh Institute of Management, 2021–2022.

12.5 BSMR NOVOTHEATRE

- Governing Board Member, 2020–present.
- Technical Acceptance Committee Member, 2022–present.
- Technical Expert Committee Member, 2022–present.
- Tender/EOI Evaluation Committee Chair/Member, 2022–present.

12.6 INFORMATION & COMMUNICATION TECHNOLOGY (ICT) DIVISION

- Bangladesh High Tech Park Authority (BHTPA):
 - Focal Person for the establishment of BUET University Innovation Hub Project funded by BHTPA.
 - Principal Coordinator for the BUET University Innovation Hub Cohort program.
- Bangladesh Computer Council(BCC): Enhancing Digital Government and Economy Project (EDGE)
 - Coordinator of Cyber Security Training for Department of ICT Officers, 2024.
 - Coordinator of Smart Land Management and Cyber Security Training for Land Ministry Officers, 2024.

- Evaluation Committee for Course Curriculum Member for Digital Skills Training to Students, 2024.
- Aspire to Innovate (a2i): Executive Committee Member for a2i Innovation Fund, 2023–present.

13 PROFESSIONAL ACTIVITIES

13.1 CONSULTANCY

- “Ascertaining the proximate cause of loss and extent of damages sustained to the Building and Machinery of Nasir Glassware and Tube Industries Limited, Mirzapur, Tangail, Bangladesh,” (2022–2023).
- “Vetting of the Drawing, Design, and estimation for the Renewal/Renovation of the 11/0.415 kV Substation at Sadharan Bima Corporation Building, 33 Dilkusha C/A, Dhaka (2022–2023).
- “Feasibility Study for Establishment of Digital Security Agency and Creation of Necessary Infrastructure in Bangabandhu Hi-Tech City, Gazipur,” (2020–2022).
- “Certification for tax-free clearance (SRO-70) of the imported materials from customs house for Patuakhali 1320 (2X660) MW coal-fired thermal power plant project,” 2022–2023.
- “Certification as per SRO-70 (Special consideration) for permanently imported consignment for the construction of a 30 MW (AC) grid-tied solar PV power plant at Kaliganj, Lalmonirhat by Intraco Solar Power Limited,” 2022.
- “Technical Audit of Renewable Energy Systems,” undertaken by the Infrastructure Development Company Limited (IDCOL) (2019–2020).
- “Fire and Electrical Safety Assessment for Ready-Made Garments Factories in Bangladesh,” a project undertaken by International Labor Organization (ILO), 2013–2014.
- “SCADA for Dhaka Power Distribution Company (DPDC) Limited,” 2015–2016.
- “Executive SCADA for Bangladesh Power Development Board,” 2013.
- “Light and Sound Show for Lalbagh Fort” work undertaken by the Department of Archaeology of the Government of Bangladesh, 2012–2013.
- Member, Bureau of Research, Testing, and Consultation (BRTC) of the Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology (2004 to date).

13.2 INVITED PANELIST/PANEL DISCUSSANT

- “Strengthening the collaboration of the Private Sector and Academia: State & Future,” organized by the Dhaka Chamber of Commerce & Industry, Dhaka, 6 July 2024.
- “Special Research Grant-Aided Projects: Seminar on Results and Applications,” organized by the Ministry of Science and Technology, Dhaka, 25 June 2024.
- “Patentability of Innovation: Bangladesh and Global Context,” National Conference on Intellectual Property and Commercialization (NCIPC 2024), Dhaka, May 15, 2024.
- “Empowering Women in Renewable Energy: A Feminist Perspective from Bangladesh and Beyond,” organized by ActionAid Bangladesh, May 8, 2024.

- “Conference on Industry-Academia Collaboration,” organized by Bangladesh University of Professionals (BUP), Mirpur Cantonment, Dhaka-1216, Bangladesh (January 24, 2024).
- “Formulation of Action Plan of the BSM Novotheatre in Building Smart Bangladesh,” organized by the BSMR Novotheatre, Dhaka (17 December 2023).
- “Bangladesh Decides: The Youth Speaks - Voice of for Sustainable Tomorrow,” organized by Her-Net Foundation in collaboration with the European Union and the French Embassy (5 December 2023).
- “Public-Private-Academia Bridging for Skill Development, organized by the Prime Minister’s Office and FBCCI Innovation and Research Centre (18 November 2023).
- “Energy Policy: Ensuring Access to Affordable, Reliable and Modern Energy Services,” at the Regional Climate Summit 2023, Dhaka, 8 September 2023.
- “Special Research Grant-Aided Projects: Seminar on Results and Applications,” (Invited discussant on the project “Development of Solar Powered IoT-Based Smart Agriculture”) organized by the Ministry of Science and Technology, Dhaka, 17 May 2023.
- “Skills for Smart Bangladesh,” organized by the Bangladesh Computer Council (BCC), Dhaka, 13 March 2023.
- “Building Smart Novotheatre using 4IR,” organized by the BSMR Novotheatre, Dhaka, 25 February 2023.
- “Industry-Academia Linkage: The New Frontier,” organized by the Dhaka Chamber of Commerce and Industry, Dhaka, 27 February 2021.

13.3 INTERNATIONAL CONFERENCE ORGANIZING

- *Technical Program Committee Member*, IEEE International Conference of Telecommunication and Photonics (ICTP), December 2023, Dhaka, Bangladesh.
- *Co-Chair, Technical Program Committee*, IEEE International Conference of Telecommunication and Photonics (ICTP), December 2019 & 2021, Dhaka, Bangladesh.
- Member, Organizing Committee, International Conference on Electrical and Computer Engineering (ICECE), December 2018, Dhaka, Bangladesh.
- Member, Technical Program Committee, 8th International Conference on Electrical and Computer Engineering, Dhaka, December, 2014.
- Member Secretary, Technical Committee, International Conference on Electrical and Computer Engineering (ICECE 2012), Dhaka, Bangladesh (2012).

13.4 NATIONAL COMMITTEES

- *PhD Fellowship and Stipend under the Prime Minister’s Education Assistance Trust Evaluation Committee Member*, 2024.
- *Research and Development Team Member*, Atlas Bangladesh Limited, April 2024–present.
- *Focal Person of BUET for D-8 Network of Pioneers for Research and Innovation (D-8 NPRI)*, April 2024–present.

- *Focal Point for BUET for the National Science and Technology Fellowship for students and Research & Development Grants for Teachers* by the Ministry of Science and Technology, Bangladesh, February 2024–present.
- *Tender Evaluation Committee Member, 40 MW through Direct Purchase Method by a tri-party Power Sales Agreement (PSA) between Bangladesh Power Development Board, Nepal Electricity Authority (NEA) and NTPC Vidyut Byapar Nigam Limited (NVVN), India, 2024.*
- *BSMR Scholar-2023 Selection Committee Member*, Prime Minister’s Education Assistance Trust, 2023.
- *Executive Committee (EC) Member* of the a2i Innovation Fund, Aspire to Innovate (a2i) Programme, November 2023–present.
- *“ICT Industry, Digital Commerce, Freelancing, Entrepreneurship and Start-up” Technical Committee Member* for the Subcommittee of the “Smart Bangladesh Taskforce,” Commerce Ministry, Government of Bangladesh, October 2023–present.
- *“ICT Industry, Digital Commerce, Freelancing, Entrepreneurship and Start-up” Subcommittee Member* of the “Smart Bangladesh Taskforce,” Commerce Ministry, Government of Bangladesh, 11 September 2023–present.
- *Advisor, FBCCI Innovation and Research Centre*, September 2023–2026.
- *Tender Evaluation Committee (Renewable Energy, TEC-07) Member*, Bangladesh Power Development Board, Ministry of Power, Energy, and Mineral Resources, July 2023–Present.
- *Tender Evaluation Committee Chair*, BSMR Novotheatre Barishal, July 2023–Present.
- *National Steering Committee Member*, Grants for Advanced Research in Education (GARE), Ministry of Education, June 2023–present.
- *Peer Review Committee on Physical Sciences (Phy-sc)* for the Special Research Grant under the Science and Technology activity of the Ministry of Science and Technology, Bangladesh (2021–present).
- *Project Implementation Committee Member* for the “Bangladesh: First Biennial Update Report (BUR1) to the UNFCCC,” undertaken by the Department of Environment, Bangladesh (2021–2023).
- *Tender Evaluation Committee Member; Dhaka Electric Supply Company (DESCO) Limited* for local and international purchases (2020–Present).
- *Evaluation Committee Member*, BSMR Industry Award 2022, Ministry of Industry (2023).
- *Selection Board Member, North-West Power Generation Company Limited*, Bangladesh (2022).
- *Technical Specification Preparation Committee for Electric Bus Member*, Bangladesh Road Transport Corporation, 2022–2023.
- *Member (External), Examination Committee, Electrical and Electronic Engineering, University of Rajshahi*, 2022–Present.
- *Member, Technical Program Committee, International Conference on Telecommunication and Photonics, Dhaka, Bangladesh*, 2023.
- *Executive Committee Member for Research*, Directorate of Technical Education, Bangladesh, May 2023–Present.

- *Tender Evaluation Committee Member*, BSMR Novotheatre Rajshahi, 2022–Present.
- *Selection and Monitoring Committee Member*, Grant for Advanced Research in Education, Bangladesh Bureau of Educational Information & Statistics (BANBEIS), Ministry of Education, 2022–Present.
- *Technical Expert Committee Member*, BSMR Novotheatre, Bangladesh, 2022–Present.
- *Governing Board Member*, BSMR Novotheatre, Bangladesh, August 2020–Present.
- *President, International Electrotechnical Commission (IEC) Bangladesh National Committee*, 2019–2021.
- *Academic Council Member*, National Institute of Youth Development, 2021–Present.
- *Evaluation Committee Member for Research Grant*, Bangladesh Council of Scientific and Industrial Research (BCSIR), 2021, 2022, and 2023.
- *Technical Program Committee Member*, International Conference on Micro-Electronics and Telecommunication Engineering (ICMETE-2016), 22–23 September, 2016, Delhi, India (technically sponsored by IEEE EDS).
- *Chair*, “Session on Photonics,” 8th International Conference on Electrical and Computer Engineering, Dhaka, December 2014.
- *Chair*, “Seminar of The Fascinating World of Sensors,” 10 March 2014, BUET, Dhaka, Bangladesh.
- *Chair*, “Seminar on Wireless Cellular Network,” 5 February 2014, BUET, Dhaka, Bangladesh.
- *Chair*, “Seminar on Towards Realizing a Tandem Plasmonic Solar Cell: The Impact of Intermediate Metal Thickness,” 25 January 2014, BUET, Dhaka, Bangladesh.
- *Chair*, “Introduction to Quantum Cascade Detector Modeling and Temperature Effects on Performance Parameters,” 15 December 2013, BUET, Dhaka, Bangladesh.
- *Chair*, “Workshop on Mid-Infrared Sources and Detectors for Sensing Greenhouse Gases,” 31 July 2013, BUET, Dhaka, Bangladesh.
- *Editor*, International Journal of Practical Electronics, Scientific Publishing Corporation, Greifswalder Platz 7, 28239 Bremen, Germany, 2013–Present.
- *Chair*, Technical Sub-Committee for procurement of Air Conditioners for the sub-project (G4, CP-2091) under Higher Education Quality Enhancement Project (HEQEP), 2013.
- *Chair*, Technical Sub-Committee for procurement of Server Computer, Laptop Computers, Network Switch, and Softwares for the sub-project (CP-2091) under Higher Education Quality Enhancement Project (HEQEP), 2013.
- *Chair*, Technical Sub-Committee for procurement of Computers, Printers, and UPS for the sub-project (G2, CP-2091) under Higher Education Quality Enhancement Project (HEQEP), 2013.
- *Member*, Selection Board for the Recruitment of Assistant Engineers for Bangladesh Chemical Industries Corporations (BCIC) (2010).
- *Member*, Organizing Committee, International Conference on Electrical and Computer Engineering (ICECE 2006), Dhaka, Bangladesh (2006).

- *Selection Board Member* for the Recruitment of Sub-Inspector for Telecom Unit, Bangladesh Police (2006).
- *Sub-Committee Member* for the preparation of tender documents for the purchase of 800 MHz Digital trunking system: Walky-talky sets, fixed sets, and microwave link for Rapid Action Battalion (RAB), Bangladesh (2006).
- *Performance Acceptance Committee Member* for 800 MHz Digital and Secure Capable Trunked Wireless Communication System for Rapid Action Battalion (RAB), Bangladesh (worth of approximately USD 2,500,000) (2005-2006).
- *Project Organizer*, Bangladesh Telegraph and Telephone Board (BTTB) billing project (worth of approximately BDT 200,00,000), 2001.

13.5 BUET COMMITTEES

- Chairman, Institutional Review Board (IRB), BUET (November 2023–Present).
- Member, Committee for Guidelines Formulation for the Institute for Robotics and Automation BUET (IRAB), 2023.
- Focal Person, University Innovation Hub Project, 2023–present.
- Member, Committee for Industrial Training for Undergraduate Students, EEE, BUET, 2023–present.
- Chairman/Member, Recruitment of Different Posts for Departments/Institutes of BUET.
- Member, Recruitment Exam Policy Formulation, 2022.
- Chairman, RISE Research Committee, BUET (2020–Present).
- Chairman, Undergraduate Student Research Grant Evaluation Committee, BUET (2022–Present).
- Chairman, Evaluation Committee, Journal Publication Incentives, BUET, 2021–present.
- Chairman, Evaluation Committee, Basic Research Grant, BUET, 2021–present.
- Chairman, Tender Evaluation Committee, Department of EEE, BUET (2021–Present).
- Member, Postgraduate Ordinance Committee, Faculty of Postgraduate Studies, BUET (2023–2025).
- Member, Academic Master Plan Committee, BUET, 2022–Present.
- Member-Secretary, Committee for Research & Innovation, BUET, 2020–Present
 - Formulated the Ordinance for the Research and Innovation Centre for Science and Engineering and got it approved by the Syndicate.
 - Formulated the Ordinance for the Faculty of Post Graduate Studies and got it approved by the Academic Council and the Syndicate.
 - Formulated the Policy for Adjunct Faculty Members at BUET and got it approved by the Academic Council and the Syndicate.
 - Formulated the Guideline for the Basic Research Grants for BUET Faculty Members and got it approved by the Syndicate.
- Member-Secretary, Board of Postgraduate Studies, EEE, BUET, 2014–2016.

- Member, Review Committee for the course on Nanodevices for the Glass & Ceramics Engineering Department of the Bangladesh University of Engineering and Technology, 2012.
- Coordinator, Bureau of Research, Testing, and Consultation, Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology, March 2012–April 2012.
- Member, Academic Council, 2014–Present.
- Member, Board of Undergraduate Studies (BUGS), Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology (2001 to date).
- Member, Board of Undergraduate Studies (BUGS), Department of Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology (2001 to date).
- Member, Committee for Industrial Training for Electrical and Electronic Engineering undergraduate students, Bangladesh University of Engineering and Technology (2006).

13.6 PROFESSIONAL SOCIETIES

- Senior Member, Institute of Electrical and Electronic Engineers (IEEE); Photonics Society, IEEE; Electron Devices Society, IEEE
- Executive Committee Member, Optical Metrology Technical Group of the OSA, 2018–2019.
- Vice-Chair, Executive Committee, IEEE Electron Devices/Solid-State Circuits Society (ED/SSCS), Bangladesh Chapter, 2019–2020.
- Membership Development Coordinator, IEEE Electron Devices Society, Bangladesh Chapter (2011).
- Member, Executive Committee, IEEE Electron Devices/Solid State Circuits Society (ED/SSCS), Bangladesh Chapter, 2013–2014.
- Vice Chair, Executive Committee, IEEE Electron Devices/Solid-State Circuits Society (ED/SSCS), Bangladesh Chapter, 2015.
- Member, The Optical Society (OSA).
- Member, American Physical Society (APS).
- Member, Institute of Engineers, Bangladesh (IEB).
- Member, Society of Photo-Optical Instrumentation Engineers (SPIE, 2005–2006).

13.7 JOURNAL REFEREE

- Advanced Materials, Nature Scientific Reports, Optics Express, Optics Letters, Photonics Technology Letters, ACS Applied Energy Materials

13.8 SOFTWARE DEVELOPMENT

1. QCL Simulation Package: Solves confined quantum energy levels and the associated electron wavefunctions of QCLs (available at <http://www.umbc.edu/photonics/software>).
2. Optical Mode Calculation: Solves optical mode shapes and confinement factors for QCLs.
3. QCL Carrier Transport: Calculates carrier distribution in the energy levels of QCLs.

14 WORKSHOPS / SHORT COURSES

- *Presentation Skills*, University of Leeds, UK, April 30 (2018).
- *Ethics and Ethical Review Training*, University of Leeds, UK, April 11 (2018).
- *Introduction to Unix for HPC*, University of Leeds, UK, June 21 (2016).
- *Matlab Advanced*, University of Leeds, UK, April 14–15 (2016).
- *Training in Cryogenic Safety*, University of Leeds, UK, April 11 (2016).
- *Workshop on Silicon Photonics Device Design and Fabrication*, IEEE Photonics Conference (IPC 2014), San Diego, CA, USA (2014).
- *Winter College on Optics: Fundamentals of Photonics - Theory, Devices and Applications*, ICTP, Trieste, Italy, February 10–21 (2014).
- *Training-Workshop on Procurement, Financial Management, and Monitoring & Evaluation*, conducted by HEQEP unit, University Grants Commission, Dhaka, Bangladesh (April 23-26, 2012).
- *Speeding Up MATLAB*, conducted by Mathworks, Washington, DC (2009).
- *Physics of Semiconductor Lasers*, conducted by Weng W. Chow, Sandia National Laboratories, IEEE Photonics Society Annual meeting (2008).
- *Quantum Cascade Lasers: From Band Structure Engineering to Commercialization*, conducted by Frederico Capasso, Harvard University, CLEO / QELS 2008, San Jose (2008).
- *Quantum Well Devices for Optics and Optoelectronics*, conducted by David A. B. Miller, Stanford University, CLEO / QELS 2008, San Jose (2008).
- *Advanced Programming in MATLAB*, conducted by Center for Interdisciplinary Research and Consulting, Department of Mathematics and Statistics, UMBC (2007).
- *Self-Contained Breathing Apparatus Training*, organized by UMBC (2007).
- *Mobile and Wireless Communication*, organized by Directorate of Continuing Education, BUET (2004).
- *Teacher's Appreciation Workshop*, organized by Directorate of Continuing Education, BUET (2001).
- *Telecom Platform and AXE Survey*, conducted by Ericsson Academy – Malaysia (2001).
- *GSM System Survey*, conducted by Ericsson Academy – Malaysia (2001).
- *CME 20 Advanced System Technique*, conducted by Ericsson Academy – Malaysia (2001).

15 REFERENCES

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