# MOHAMMAD ABDULLAH AL MAMUN


**CONTACT INFORMATION**

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**RESEARCH INTERESTS**

Strongly correlated materials, Novel topological states of matter, Spintronics
Thin film deposition & growth techniques, First – principle calculations of novel materials.

**EDUCATION**

Bangladesh University of Engineering & Technology (BUET)

- M.Sc. in Glass & Ceramic Engineering — February, 2020
  *CGPA:* 3.75/4.0 | *Supervisor:* Prof. Md. Fakhrul Islam
  *Thesis:* "Role of Oxygen Vacancies on Ferromagnetism in Oxide Dilute Magnetic Semiconductor: $TiO_2$"
- B.Sc. in Materials & Metallurgical Engineering — February, 2017
  *CGPA:* 3.54/4.0 (Last 4 semesters CGPA: 3.71/4.00)
  *Thesis:* "Hydrothermal Synthesis & Characterization of Pure & Doped $BiVO_4$ NPs" [PDF] [Presentation]

**RESEARCH EXPERIENCES**

Oxide based Dilute Magnetic Semiconductors

*PIs:* Prof. Md. Fakhrul Islam & Dr. Md. Abdullah Zubair

- $Ti_{1-x}M_xO_2$ & $Ce_{1-x}M_xO_2$ nanoparticles (NPs) have been synthesized using sol – gel and hydrothermal chemical routes.
- Effect of heat treatment and doping of Transition and Rare Earth Metal ions on oxygen vacancy concentration in $Ti_{1-x}M_xO_2$ & $Ce_{1-x}M_xO_2$ have been investigated.
- Structural properties were investigated using XRD, Raman, HR – TEM and XPS analysis. Optical and Magnetic properties were investigated using UV – Vis and VSM analysis.

Multifunctional Materials for Photocatalytic and Antibacterial Applications

*PIs:* Prof. Md. Abdul Matin & Prof. M. A. Hakim

- $BiV_{1-x}M_xO_4$ & $CeO_2 - CePO_4$ NPs have been synthesized using hydrothermal and green synthesis routes (using leaf extracts) respectively.
- Effect of Transition Metal ion doping in $BiV_{1-x}M_xO_4$ NPs is currently under investigation

**JOURNAL PUBLICATIONS**

1. **Md. Abdullah Al Mamun***, Manifa Noor*, A.K.M Atique Ullah, Md. Sarowar Hossain, Matin Md. Abdul, Md. Fakhrul Islam, M.A Hakim. *"Effect of $CePO_4$ on Structural, Magnetic and Optical Properties of Ceria Nanoparticles"* Materials Research Express (2018). (* for equal contribution of authors). [PDF]
2. **Md. Abdullah Al Mamun**, Manifa Noor, Muhammad Hasanuzzaman, Saleem Hashmi. *"Nano-Porous Materials for Use in Solar Cells and Fuel Cells"* Reference Module in Materials Science and Materials Engineering, Elsevier. (2019) [PDF]
3. S.K Sen, Manifa Noor, **Md. Abdullah Al Mamun**, M.S. Manir, M.A. Matin, M.A. Hakim, S. Nur, Supria Dutta. *"An investigation of $^{60}Co$ gamma radiation-induced effects on the properties of nanostructured α-$MoO_3$ for the application in optoelectronic and photonic devices"*. Optical and Quantum Electronics, Springer (2019) [PDF]

- Abdullah Zubair, **Md. Abdullah Al Mamun**, Karrina McNamara, SAM Tofail, Md. Fakhrul Islam, Vasily Lebedev. "Structure and interface of samarium/anatase nanocomposites Amorphous interface oxide formed due to high amount of Sm doping (5-20 mol%) stabilizes finer size anatase and lowers indirect band gap" *(under review in Applied Surface Science)*

## CONFERENCES

- **Md. Abdullah Al Mamun**, Manifa Noor, Karrina McNamara, Md. Sarowar Hossain, MA Hakim, Abdullah Zubair, SAM Tofail, Md. Fakhrul Islam, Vasily Lebedev, "Structure and interface of samarium/anatase nanocomposites lead to visible light absorption and superparamagnetism" Progress in Applied Surface, Interface and Thin Film Science, 2019. Florence, Italy. [PDF]
- Matin, M.A., Noor, M., **Mamun, M.A.A.**, Hakim, M.A., Islam, M.F., Khanom, F., Rafique Ahmed, A.K.M. & Ramakrishna, S. "Green nanotechnology for effective dye-degradation of industrial effluents" Conference by Circular Economy Asia Pacific, 2019. NUS, Singapore. [PDF]
- Manifa Noor, **Md Abdullah Al Mamun**, M.A. Matin, Md. Fakhrul Islam, Saima Haque, Farabi Rahman, Nazmul Hossaim and M A Hakim "Effect of pH Variation on Structural, Optical and Shape Morphology of $BiVO_4$ Photocatalysts" 10th Int. Conference on Electrical & Computer Engineering (ICECE) 2018. Dhaka, Bangladesh. [PDF]
- Manifa Noor, **Md. Abdullah Al Mamun**, A.K.M. Atique Ullah, M.A. Matin, Saima Haque, Fakhrul Islam, M.A. Hakim "Green Synthesis of $CeO_2$ Nanoparticles Using *Artocarpus heterophyllus* Leaf Extract for Photocatalytic Activity" 2nd Int. Conf. on Physics for Sustainable Development and Technology, 2017. Chittagong, Bangladesh. [PPT]
- **Md. Abdullah Al Mamun**, A.F.M. Hossain, Mehedi Hasan, Md. Miftaur Rahman "Hydrothermal Synthesis & Characterization of Bismuth Vanadate Photocatalyst" Proc. International Conf. of Engineering Materials & Metallurgical Engineering (ICEMME) 2016. Dhaka, Bangladesh. [PDF]

## AWARDS AND SCHOLARSHIPS

- Dean's List, Faculty of Engineering, BUET, 2016.
- University Merit Scholarship, Faculty of Engineering, BUET, 2015 – 2016.
- 9th at ACM – ICPC Semifinal, Bangladesh Site, (BUET_Seivers), 2014.
- Honorable Mention, Inter Uni. Programming Contest at Daffodil Uni., Bangladesh, 2014.
- 6th BUET Intra Programming Contest (BUET_Seivers), BUET, Bangladesh, 2013.

## TEACHING EXPERIENCE

Teaching Assistant, Dept. of GCE, BUET

- GCE 6602: Nanoceramics (October Semester, 2017)
- GCE 6402: Magnetic Ceramics (October Semester, 2018)

## PROFESSIONAL EXPERIENCE

Research Associate, Dept. of GCE, BUET — November 2018 – Present

- Performed several Industrial and one government research investigation.
- My responsibility is to assist and mentor other M.Sc. and B.Sc. students with their materials synthesis and characterization analysis.

## PROGRAMMING EXPERIENCE

- Wrote C++ codes to analyze the randomly post processed data of LAMMPS. [Link]
- Wrote an Algorithm in C++ for "Industrial Design Layout & Manufacturing Cost Estimation of Cast Iron Pot" (Senior Year Project) [Link]
- Participated & won titles in several national & international programming contests arranged in Bangladesh as an algorithmic contestant of BUET Programming Teams, 2012 – 2014.

## TECHNICAL SKILLS

- Hands on experience on operating Thermal Evaporator (Ulvac VTR-060M/ERH), XRD (Empyrean, PANalytical), UV – Vis Spectroscopy (Lambda 1050, Perkin-Elmer, USA), FE – SEM (JSM 7600F, Jeol, Japan), Spin Coater, Microwave Reactor, High Temperature Furnace, Photocatalytic Reactor, Rapid Thermal Annealing Furnace (MILA 5050)
- Programming Languages: C, C++
- Scientific Computing Environment: MATLAB, Origin Plot.
- Visualizing Tools: ImageJ, Vesta, Ovito.
- Rietveld Refinement: Highscore Plus, Fullprof Suite.