

Musanna Galib

4-Year Doctoral Fellow (4YF) & Graduate Research Assistant
Department of Mechanical Engineering
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HIGHLIGHTS

- Research on rechargeable batteries and thin films
- Worked as a university lecturer for 4 years (2017-2021)
- Worked as an award leader (part-time) in The Duke of Edinburgh's Award Foundation Bangladesh (2017-2021)
- Worked as a staff member of The 13th and 12th International Conference on Mechanical Engineering (ICME 2019, ICME 2017)
- Chaired a session on Society of Engineering Science Annual Technical Meeting (SES 2023)

EDUCATION

Ph.D. • Mechanical Engineering (CGPA: 87%) [Sep 2020 - Present]
UBC, Vancouver, BC, Canada
Dissertation title: Dendrite Inhibition Strategy using Hetero-epitaxy in Thin Film Deposition Mechanics

M.Sc. • Mechanical Engineering (CGPA: 3.92/4.00) [Apr 2017 – May 2019]
BUET, Dhaka, Bangladesh
Dissertation title: Study of electro-mechanical properties of manganese-based nanocomposites for supercapacitors

B.Sc. • Mechanical Engineering (CGPA: 3.92/4.00) [Apr 2012 - Feb 2017]
BUET, Dhaka, Bangladesh
Dissertation title: Computer Modeling of Fire Smoke Movement in Multizone Structure Using Two Open Source Platforms

RESEARCH EXPERIENCE

Battery Research • Modeling and Simulation Research Group, Mechanical Engineering, UBCV
• Advanced Materials for Energy Storage Lab, School of Engineering, UBCO
Super-capacitor Research • M.Sc. Thesis, Dept of M.E., BUET
Earth Pipe Cooling System Research • Research project with Dr. Hannan
Fire Smoke Movement Research • B.Sc. Thesis, Dept of M.E., BUET.

WORK EXPERIENCE

Graduate Teaching Assistant • Dept. of Mechanical Engineering, UBC [September 2022- Present]
Courses conducted
• MECH 260 - Introduction to Mechanics of Materials
• MECH 220 - Technical Skills Practicum - Mechanical Drafting Book Development
• APSC 100, 101 - Introduction to Engineering I, II
Exam Invigilator
• Centre for Accessibility, UBC [November 2021- Present]
• UBC Sauder School of Business [December 2021- Present]

Lecturer • Dept. of Mechanical Engineering, BUET [May 2017- September 2021]

Courses conducted

• 13 Courses

(60 Students average per class)

TECHNICAL SKILLS

Programming Languages: C, HTML, CSS, MATLAB, Bash.

Material Simulation Tools: VASP, LAMMPS.

FEM Modeling Tools: ABAQUS, MOOSE.

Visualization Tool: Vesta, OriginPro, OVITO, Paraview, Atomsk.

Battery Testing: Battery cell assembly, Cyclic testing, In-situ optical microscopy.

Clean-room Testing: DEKTAK profilometer.

High-performance Computing (HPC): Compute Canada, Sockeye Server.

Drawing & Design Tools: Solidworks.

Documentation & Presentation Application: Office Suite, LaTeX.

Operating System: Windows (WSL), Linux (Ubuntu).

PUBLICATION *Journal Publication*

- **Galib, M.**, Orhan, K.O., Liu, J., and Ponga, M., 'Evolution of Residual Stresses in Lattice Mismatched Epitaxial Layers in Thin Film Deposition', 2023 (Under Preparation).
- Khan, A.A., Rabi, S.S., Jamee, T. **Galib, M.**, Ashek, F.E., and Rahman, M.A., 'Effects of Crumpling Stage and Porosity of Graphene Electrode on the Performance of Electrochemical Supercapacitor,' 2023, Physical Chemistry Chemical Physics (Under review).
- **Galib, M.**, Orhan, K.O., and Ponga, M., 'Engineering Chemo-Mechanical Properties of Zn Surfaces via Alucone Coating', 2022, J. Phys. Chem. C, 127, 5, 2481–2492.
- **Galib, M.**, Hosen, M.M., Saha, J.K., Islam, M.M., Firoz, S.H., and Rahman, M.A., 'Electrode Surface Modification of Graphene-MnO₂ Supercapacitors using Molecular Dynamics Simulations', Journal of Molecular Modeling, 26, 251, 2020.
- Saha, P., Ishtiaque, M.M.U., Sutradhar, A., **Galib, M.**, and Hannan, M.A., 'A sustainable approach to improve the efficiency of Earth Pipe Cooling System', International Journal of Sustainable Engineering, 13, 5, 387-397, March 2020.

Conference Publication

- Arka, A.M., Mridha, R.H., Shafqat, R., **Galib, M.**, and Morshed, AKM M., 'Design and Comparative Parametric Analysis Using NSGA-II for Multivariable Constrained Optimization of Shell and Tube Heat Exchangers', 13th International Conference on Mechanical Engineering (ICME), December 2019, Dhaka, Bangladesh
- Saha, P., **Galib, M.**, Ishtiaque, M.M.U., Akanda, S.R., and Hannan, M.A., 'Numerical Study on Improving the Efficiency of the Earth Pipe Cooling System', International Conference on Civil and Environmental Engineering (IC-CEE 2018), November 2018, Kuala Lumpur, Malaysia.
- Khandoker, M.A.R., **Galib, M.**, Islam, A., and Rahman, M.A., 'Modeling of re smoke movement in multizone garments building using two open source platforms', The 7th BSME International Conference on Thermal Engineering 2016, June 2017, Dhaka, Bangladesh.

- Chatterjee, A., **Galib, M.**, and Sarkar, M.A.R., ‘Application of Arduino in designing modern electromechanical laboratory’, 2017 IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI), June 2018, Chennai, India.

TALKS & CONFERENCES

- ‘Dendrite Inhibition Strategy using Hetero-epitaxial Residual Stresses in Thin Film Deposition Mechanics’ [9 October 2023]
Society of Engineering Science Annual Technical Meeting (SES 2023)
Minneapolis, Minnesota, October 8-11, 2023
- ‘Using Thin Film to Improve Metal Anode Battery Safety’ [9 March 2023]
Top presenter, Open heat - 3 Minutes Thesis (3MT)
Vancouver, UBC, March 9, 2023
- ‘Residual Stresses in Thin Film Deposition Mechanics’ [19 October 2022]
Society of Engineering Science Annual Technical Meeting (SES 2022)
College Station, Texas, October 16 - 19, 2022

HONORS & AWARDS

- Collaborative Research Mobility Award (UBC CRMA) in UBC [Jan-Dec 2023]
- 4-Year Doctoral Fellowship in UBC [Sep 2020 - Present]
- Faculty of Applied Science Graduate Award in UBC [Sep 2021]
- President’s Academic Excellence Initiative Ph.D. Award (PAEIPA) in UBC [Sep 2020 - Present]
- International Tuition Award in UBC [Sep 2020 - Present]
- Dean’s List for 4 consecutive years in BUET. [Feb. 2013 - Feb. 2017.]
- University Merit for 4 consecutive years in BUET. Feb. [2013 - Feb. 2017]
- Board Scholarship in HSC 2011. Jan. [2011]
- Board Scholarship in SSC 2009 (37th position in Bangladesh). [Jan. 2009.]

INTERNSHIP & PROFESSIONAL EXPERIENCES

- Member, Board of Undergraduate Studies (BUGS), Department of Mechanical Engineering, BUET [2017-2021]
- Member, Bureau of Research, Testing and Consultation (BRTC)[2019-2021]
- Member, Secretariat and Publication committee, The 13th International Conference on Mechanical Engineering (ICME 2019)
- Member, Publication committee, The 12th International Conference on Mechanical Engineering (ICME 2017)
- Intern at Kohinoor Chemical Co.- Bangladesh Limited [July 2016 – Sep 2016]

EXTRA-CURRICULAR ACTIVITIES

- Vice President (Academic), Mechanical Engineering Graduate Association, UBC. [2022-Present]
- Award Leader, The Duke of Edinburgh’s Award Foundation Bangladesh.[2017-2021]
- Gold Awardee of ‘The Duke of Edinburgh’s Award. [2017]
- Member at United Nations Youth and Students Association of Bangladesh (UN-Y SAB) [2013-16]
- Financial Secretary at BUET Self Defense Club. [2016-17]

REFERENCES

- Mauricio Ponga, Ph.D.
Associate Professor, Department of Mechanical Engineering
The University of British Columbia, Canada.
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- Jian Liu, Ph.D.
Associate Professor, School of Engineering, Faculty of Applied Science
The University of British Columbia, Canada.
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- Okan K. Orhan, Ph.D.
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