

MD FAHEL BIN NOOR

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EDUCATION

Master of Science in Materials Science
Missouri State University, Springfield, MO

Expected Graduation: December 2023

- **GPA:** 3.88/4.00
- **Thesis:** Growth and Characterization of Intermetallic Compounds as Promising Candidates for Future Energy and Electronic Devices
- **Projects:**
 - Synthesis and exploration of half-Heusler alloy CoNbSn
 - Synthesis and exploration of disordered ferrimagnet $Mn_{4-x}Cr_xAl_{11}$ and disordered $Fe_4Al_{13-x}Si_x$
 - Synthesis of cage-structured AB_2Zn_{20} (A=Hf, Nb; B=Cu, Mn) compounds for thermoelectricity
 - Density functional theory analysis of half Heusler alloy CoNbSn
 - Hydrothermal synthesis of Na-based cathode materials for battery applications
 - Fabrication of Au-MgO-Au capacitor using sputtering & pulsed laser deposition

Bachelor of Science in Mechanical Engineering
Chittagong University of Engineering & Technology, Bangladesh

Graduated: November 2019

- **GPA:** 3.67/4.00
- **Thesis:** Experimental Evaluation with Comparative Steady-state Thermal Analysis of Two-wheeler Engine Cylinder by Varying Its Fin Arrangement and Material

Graduate Record Examination

Total: 313 | **Quantitative:** 163 | **Verbal:** 150 | **Analytical Writing:** 4.0

TECHNICAL SKILLS

- Material Synthesis and Deposition: Single crystal growth with flux, Mechanical alloying, Pulsed Laser Deposition (PLD), Sputtering, Hydrothermal synthesis of battery cathode materials
 - Characterization: Scanning Electron Microscope (SEM), Energy Dispersive Spectroscopy (EDS), X-ray Diffraction (XRD), Raman Spectroscopy, UV-VIS, Electrical measurement (I-V), and magnetometry (MPMS)
 - Programming language: Python, MATLAB
 - Characterization Software: OriginPro, TOPAS, ImageJ
 - Basics of Machine Learning, Data Science and Deep Learning with Python (Udemy Certified)
 - Simulation Software: OVITO, Quantum Espresso, LAMMPS
 - Design Software: Solid Works, AutoCAD
 - Microsoft Office suite
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RESEARCH INTEREST

- Designing advanced cathode materials
- Electronic, optical and magnetic materials
- Computational materials science
- Energy conversion materials

PROFESSIONAL EXPERIENCE

Graduate Teaching Assistant

January 2022–Present

Department of Physics, Astronomy, and Materials Science, Missouri State University

- Deliver a variety of teaching and evaluation activities, including tutorials, aimed at delivering undergraduate level subjects
 - Supervise practical work and provide advice on skills, methods, and approaches to aid information transfer
 - Adept at preparing examinations, reading reports, grading projects, and applying departmental processes related to peer advising/mentoring
- Teaching labs of Foundations of Physics I (calculus-based), Spring '22, Fall '22 and Spring '23

Graduate Research Assistant

Summer 2022 & Summer 2023

Novel Materials Lab of Dr. Tiglet Besara, Department of Physics, Astronomy, and Materials Science, Missouri State University

- Designed, synthesized as single crystals, and characterized novel materials: half-Heusler NbCoSn, cage-structured AB_2Zn_{20} (A=Hf, Nb; B=Cu, Mn) for thermoelectricity and energy applications, ferrimagnet $Mn_{4-x}Cr_xAl_{11}$, disordered $Fe_4Al_{13-x}Si_x$
- Grew full Heusler Alloys of Fe_2CrAl and Co_2FeAl using mechanical alloying, with potential use as catalyst for different precious reactions in the Oil & Gas industries

Engineer-Production (Re-heating Furnace and Rolling Module)

March 2020–November 2021

Bangladesh Steel Re-Rolling Mills Limited, Sitakund Industrial Area, Chattogram, Bangladesh

- Supervised and developed process improvements to effectively utilize equipment and materials to maximize best quality steel bars production
- Experienced to work on 5S, Six Sigma, ISO 9001:2015 (Quality Management System), ISO 14001:2015 (Environmental Management System), ISO 45001:2018 (Occupational Health and Safety Management System), Lean-to Lead project, Fire Safety Project

INTERNSHIP

December 2017–January 2018

Carriage & Wagon Workshop, Bangladesh Railway, Chattogram, Bangladesh

- Supervised Assembling and put prefabricated motor vehicle parts and components together
- Inspected the motor vehicles for defects and tested the assembled equipment for proper performance and conformity to quality standards

AWARDS

- Safety Icon of the Year, *Bangladesh Steel Re-Rolling Mills Limited*, Chattogram, Bangladesh, November 2020
- Awarded Technical Scholarship from the Department of Mechanical Engineering, *Chittagong University of Engineering & Technology*, Bangladesh (May 2015–November 2019)

MANUSCRIPTS / PUBLICATIONS

- 1) **M.F.B. Noor**, N. Yasmin, K.-M. Law, A.J. Hauser and T. Besara, “Ferrimagnetism in Cr-substituted intermetallic $Mn_{4-x}Cr_xAl_{11}$ ”- (Status: Manuscript ready for submission)
- 2) **M.F.B. Noor**, N. Yasmin, K.-M. Law, A.J. Hauser and T. Besara, “Exploration of properties of Half-Heusler NbCoSn”- (Status: Manuscript under preparation)

- 3) N. Yasmin, **M.F.B. Noor**, and T. Besara, “Structure and Magnetism of the New Cage-structured Compound $\text{HfMn}_2\text{Zn}_{20}$ ”-(Status: Under review at *Physical Review Materials*; arXiv: <http://arxiv.org/abs/2306.01146>)
- 4) S. Longworth, M. Mou, N. Yasmin, **M.F.B. Noor**, R. Sakidja, and T. Besara, “Single Crystal Growth and Electronic Structure of New $\text{MCu}_2\text{Zn}_{20}$ (M = Nb, Hf) Compounds”- (Status: Manuscript ready for submission)

PRESENTATIONS / CONFERENCE PROCEEDINGS

- 1) Poster presentation: “Exploration and Single Crystal Growth of Half-Heusler and Two New Inter-metallic Ternary Compounds”, 30th Annual Einhellig Graduate Interdisciplinary Forum at Missouri State University, Springfield, MO, 2023.
- 2) Oral presentation: “Synthesis and Exploration of Heusler Intermetallics as Potential Catalysts”, American Physical Society (APS) March Meeting, Las Vegas, NV, 2023
- 3) Oral presentation: “Synthesis and Exploration of Half-Heusler and Two Other Ternary Intermetallic Single Crystals”, Materials Science & Technology October Meeting (MS&T23), Columbus, OH, 2023 (Accepted for presentation)
- 4) **M.F.B. Noor**, A. Hossain, and A. Habib, “Experimental Evaluation with Comparative Steady- State Thermal Analysis of Two- Wheeler Engine Cylinder by Varying Its Material,” in Proceedings of the 5th International Conference on Mechanical Engineering and Renewable Energy, 2019, Chittagong, Bangladesh. (PI-CMERE19-253)
- 5) **M.F.B. Noor**, B. Mallick, A. Habib, “Heat storage system: A modern way to reuse and recycle energy to reduce thermal pollution”, in Proceedings of the international conference on mechanical, industrial, and energy engineering, 2018, Chittagong, Bangladesh. (PI-ICMIEE18-187)

EXTRACURRICULAR ACTIVITIES

- **Volunteer** – Regional Science Olympiad February 2023
Missouri State University, Springfield, MO
- **Event Leader** – State Science Olympiad April 2022
Missouri State University, Springfield, MO
- **Research Development Coordinator** September 2018–September 2019
IEEE Student Branch, *Chittagong University of Engineering & Technology*, Bangladesh
- **Research & Publication Secretary** June 2015–November 2019
CUET Research & Innovation Club *Chittagong University of Engineering & Technology*, Bangladesh