

# Md. Aslam Beg Akash

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## RESEARCH INTERESTS

- Computational mechanics of materials
- Fracture and damage mechanics
- Composite materials and interfaces
- Bioinspired and architected materials
- Additive manufacturing
- Machine learning for materials

## EDUCATION

**Khulna University of Engineering & Technology (KUET)**

Khulna, Bangladesh

*Bachelor of Science in Mechanical Engineering*

*March 2022–August 2026*

CGPA: 3.42/4.00    Final six semesters: 3.54/4.00 (118.5 credits)

Class position: Top 20% (out of 142 students)

- **Thesis:** Fracture Behavior and Toughness of  $\text{Ti}_2\text{N}$  MXene Monolayer under Uniaxial Tension: A Study Using Molecular Dynamics and Fracture Mechanics.
- **Supervisor:** Dr. Md. Abdul Wakil.
- **Synopsis:** Investigated fracture strength and toughness of monolayer titanium nitride ( $\text{Ti}_2\text{N}$ ) MXene using molecular dynamics simulations and fracture mechanics models, including nonlinear fracture mechanics (NLFM) and quantized fracture mechanics (QFM), accounting for the material's nonlinear elasticity.

## RESEARCH MANUSCRIPTS

### Under Peer Review

- Mostofa Aadeeb Chowdhury<sup>†</sup>, **Aslam Beg Akash**<sup>†</sup>, Sanjana Chowdhury<sup>†</sup>, Md. Ashraful Islam. “Loading-Mode Dependent Stacking Sequence Effects in Basalt-Carbon-Kevlar Hybrid Laminates: The Role of Dissimilar-Ply Interfaces.” Under peer review at *Polymer Composites*.

### In Preparation

- **Aslam Beg Akash**<sup>†</sup>, Kazi S. M. Jaman Fahim<sup>†</sup>, Jacob Wolfe, Dakota Delattre, Jun Li, Md. Abdullah Al Bari, Md. Fazlay Rabbi. “Bioinspired Bi-Material Bouligand Meso Structure with Enhanced Mechanical Properties: An Experimental and Computational Investigation.” Target journal: *Composite Structures*; planned submission: early November 2026.
- Mohtasim Alam Shifat, Md. Ali Imran Khan, **Aslam Beg Akash**, Abdullah Al Mahmud, Arup Kumar Debnath, Md. Abdul Hasib. “Investigation of the Physico-Mechanical and Thermal Characteristics of Coir Powder-Filled Kenaf/(Carbon/Kevlar)/Kenaf Hybrid Epoxy Composite.” Target journal: *SPE Polymers*; planned submission: November 2026.
- **Aslam Beg Akash**, Md. Abdul Wakil, Md. Nadeem Azad, Saifuddin Zafar, Md. Ashraful Islam. “Nonlinear Elasticity and Fracture Toughness of Monolayer  $\text{Ti}_2\text{N}$  MXene.” Manuscript writing in progress.

<sup>†</sup> Equal contribution.

## RESEARCH EXPERIENCE

- **Sodium Silicate and Water Hyacinth Ash Fillers in Jute/Epoxy Composites**  
*Supervisor:* Dr. Md. Arifuzzaman, KUET.  
Synthesized rice-husk-derived sodium silicate, fabricated composite specimens, conducted tensile and flexural testing, and characterized filler morphology and composition using SEM–EDS; contributed to manuscript writing.
- **Crack-Path Prediction in Polycrystalline h-BN Using Deep Learning** *Ongoing*  
Developing a convolutional–bidirectional recurrent neural network (CNN–BiRNN) framework to predict crack paths from initial microstructures. Molecular dynamics simulations are underway to generate the training dataset.

## TECHNICAL SKILLS

- **Simulation & CAD:** LAMMPS (molecular dynamics), Abaqus and PrePoMax (FEA), OVITO, SolidWorks.
- **Programming & Data Analysis:** Python (NumPy, pandas, SciPy, Matplotlib) and C.
- **Machine Learning & Deep Learning:** scikit-learn, Keras.
- **Experimental & Characterization:** Composite fabrication; tensile and flexural testing (UTM); SEM–EDS, FTIR, TGA, DSC, and thermal conductivity testing.

## INDUSTRIAL INTERNSHIP

**RAK Ceramics Bangladesh Ltd.**

*May 2025*

Ceramic body formulation and preparation, pressing, firing, and quality-control parameters for tiles and sanitaryware.

## HONORS & ACTIVITIES

- Technical Board Scholarship, KUET (awarded for top-half class standing).
- Runner-up, inter-hall chess tournament; runner-up, inter-university football tournament.
- Organizer, IGNITION 2026 — National Mechanical Festival, KUET.