Department of EEE, BUET, IEEE ED/SSCS Bangladesh Jt. Chapter, and IEEE EDS BUET SB Chapter

Notice

A talk, jointly organized by the Dept. of EEE, BUET, IEEE ED/SSCS Bangladesh Jt. Chapter and IEEE EDS BUET Student Branch Chapter, is arranged as per the following schedule:

Date and Time:	17 December 2025 (Wednesday) at 12 PM
Venue:	Room no. 634, Dept of EEE, ECE Building, BUET

Title: New Frontiers in Quantum Materials
Speaker: Md Shafayat Hossain, Assistant Professor, Department of Materials Science and Engineering, University of California, Los Angeles

You are cordially invited to attend the talk.

Dr. A. B. M. Harun-Ur-Rashid
Professor and Head
Dept. of EEE, BUET
Dhaka, Bangladesh

Dr. Ahmed Zubair
Professor, Dept. of EEE, BUET
and
Chair, IEEE ED/SSCS Bangladesh Jt. Chapter

Abstract: As we enter the quantum era of technology, quantum materials—those exhibiting pronounced quantum effects- hold promise for energy-efficient electronics and scalable quantum computers. I will outline three directions my group is pursuing to understand their physics and gain insights on how to transition these materials from the lab to real-world applications. First, I will discuss our work on the topological excitonic insulator and how one can potentially transfer charge-neutral and charged quasiparticles there without any dissipation. Second, I will touch upon our efforts to understand the unconventional superconductivity and charge density waves in kagome metals. Finally, I will mention how we are building on our discovery of a room-temperature quantum spin Hall state and pushing toward energy-efficient electronic devices.

Brief Biography of the Speaker: Md Shafayat Hossain is an Assistant Professor in the Department of Materials Science and Engineering at the University of California, Los Angeles (UCLA). He is also affiliated with the California NanoSystems Institute and the Center for Quantum Science and Engineering at UCLA. Before joining UCLA, he was a lecturer and postdoctoral associate in the Department of Physics at Princeton University. He earned his Ph.D. in Electrical Engineering & Materials Science from Princeton, where he was a Fellow in Natural Sciences & Engineering and a University Administrative Fellow. His research uses scanning tunneling microscopy, quantum transport, and optical techniques to explore quantum materials and devices. Shafayat's work includes discovering the first room-temperature, ambient-pressure quantum state and the experimental realization of quantum phases that had long eluded experimental observation, such as Bloch ferromagnetism, the Pomeranchuk instability, hybrid topology, and topological excitonic insulators.