Title: Quantum Computing – Principles, Current Status, and Future Prospects

Abstract:
Quantum computing has recently emerged as one of the most prominent topics in science and technology. Quantum computers are revolutionary devices that exploit the unique features of quantum mechanics for information processing. This talk will provide an accessible introduction to the key principles underlying quantum computation, such as quantum superposition and entanglement. It will then examine the current global landscape of quantum computer development, including its limitations and technical challenges. Finally, the potential impact of quantum technologies on fields such as information and communication, energy, security, and materials science will be discussed, together with reflections on the evolving role of physics in the forthcoming quantum era.