# Exploring Mesoscopic World
# Through Circuit Quantum Electrodynamics

*Byoung-moo Ann*

*Senior Research Scientist*

*Korea Research Institute of Standards and Science (KRISS)*

*(byoungmoo.ann@kriss.re.kr).*

Circuit Quantum Electrodynamics (cQED), comprising superconducting qubits and microwave resonators, stands as the cornerstone platform driving modern superconducting quantum technologies. This colloquium will begin with a comprehensive overview of the fundamental principles of cQED systems, followed by an exploration of ongoing endeavors aimed at their technological application and practical realization. In particular, we will highlight recent milestones in Quantum Interconnect research achieved at the Korea Research Institute of Standards and Science (KRISS).

Furthermore, overcoming the inherent material limitations of superconducting quantum devices requires a profound understanding of mesoscopic physics. In the latter half of the talk, we will elucidate the deep interplay between superconducting qubit research and mesoscopic physics. Alongside a review of the latest developments in the field, we will also present closely related, cutting-edge experimental outcomes from KRISS, offering new perspectives on pushing the boundaries of quantum hardware.