

Quantum information science has been emerging in the last couple of decades because of its genuine insights into basic problems in computation and communication. These ideas might revolutionize our technology if we overcome many technical challenges. Among these obstacles, characterization of the quantum state of a system is the first step towards any successful quantum information processing task. In this talk, I would address the measurement paradigm which not only is one of the pillars of quantum mechanics, but also is necessary to characterize the state of a quantum system. I would discuss how one thinks about the optimal information gain from a two-level quantum state and how one can realize it in an experiment. In addition, I would argue that the combination of measurement and control can be a way to generate exotic quantum states.