**Abstract**

“Quantum computing” is one of the phrases that invoke the imagination of future technology.

Despite the incredible power of today’s supercomputers, many complex computing problems cannot be addressed by conventional systems. The huge growth of data and our need to better understand everything from the universe to our own DNA leads us to seek new tools that can help provide answers. Quantum computing is the next frontier in computing, providing an entirely new approach to solving the world’s most difficult challenges. Since 1982, Richard Feynman proposed the idea of quantum computing for the first time, it has become a new field of interest for many physics and computer scientists. Although it’s more than 30 years that this concept has been presented but it’s still considered as unknown and several subjects are open for research.

Superconducting Quantum Processors are considered to be one of the most promising candidate technology to implement QC. Due to the rapid development of superconducting quantum computing, the global race to the quantum computer is in full swing. Many technology industries, including Google, IBM, Microsoft, and as well as Intel, are jockeying for a position in quantum computing. All these advances and efforts have brought a promising future for superconducting quantum computing. In this seminar, a brief basics and fundamental ideas of superconducting quantum computing, superconducting qubits, the qubit design, and quantum processor are introduced with focus on its architecture, along with an overview of different quantum computers from companies like IBM and D-wave.

All these companies are developing quantum computing systems to tackle complex computations for both business and financial modelling, medical researches, machine learning, communication, cryptography and engineering services. Quantum computers can solve problems that are impossible or would take a traditional computer an impractical amount of time (millions years) to solve. Hence, quantum computers will change the world, leading to better and faster solutions to the most challenging problems, and to unprecedented applications.