Contribution ID: **10** Type: **not specified**

The Quantum Way of Doing Computations (Evening Lecture)

Wednesday, August 30, 2017 7:00 PM (1 hour)

Since the mid-nineties of the 20th century, it became apparent that one of the centuries'most important technological inventions, that is computers in general, and many of their applications can be further enhanced by using operations based on quantum physics. This is timely since the classical roadmap for the development of computational devices, commonly known as Moore's law, will cease to be applicable within the next decade. This is due to the ever-smaller sizes of electronic components that soon will enter the quantum physics realm. Computations, whether they happen in our heads or with any computational device, always rely on real physical processes, which are data input, data representation in a memory, data manipulation using algorithms and finally, the data output. Building a quantum computer then requires the implementation of quantum bits (qubits) as storage sites for quantum information, quantum registers and quantum gates for data handling and processing and the development of quantum algorithms. In this talk, the basic functional principle of a quantum computer will be reviewed. It will be shown how strings of trapped ions can be used to build a quantum information processor and how basic computations can be performed using quantum techniques. Routes towards a scalable quantum computer will be discussed.

Presenter: Prof. BLATT, Rainer (Universität Innsbruck)

Session Classification: Evening Lecture